# THE IRON AGE

**A Review of the Hardware, Iron and Metal Trades.**

Published every Thursday Morning by David Williams, Nos. 96, 98, 100 & 102 Reade St., New York.

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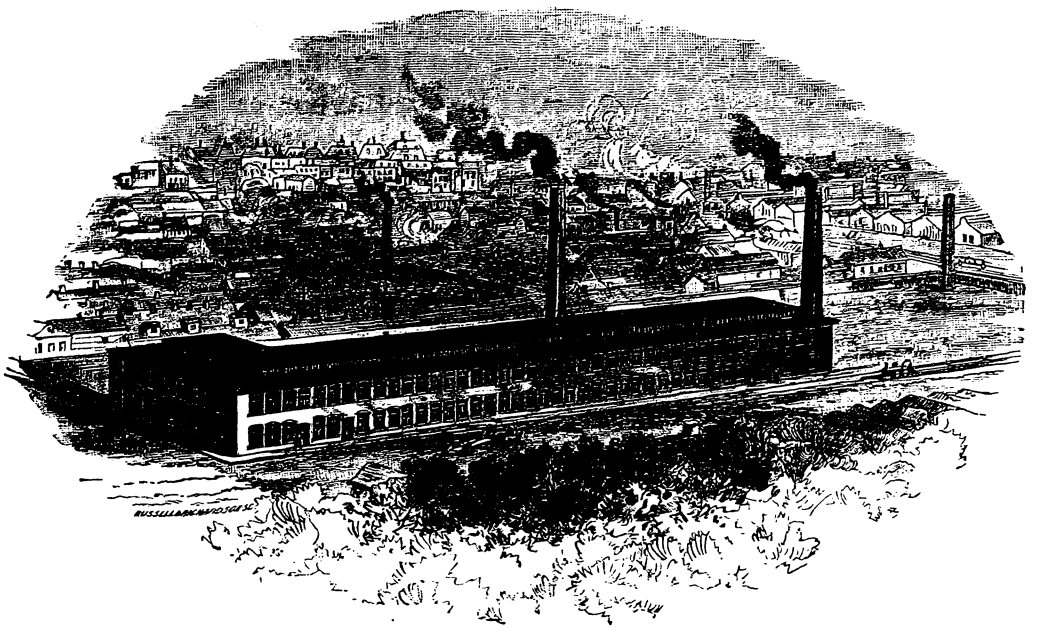
# American Screw Company,

PROVIDENCE, R. I.



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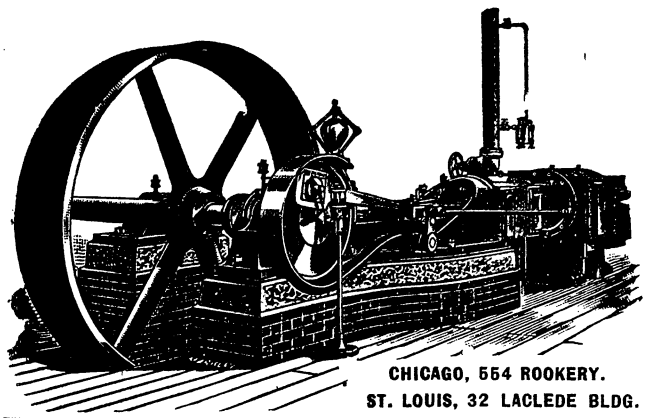

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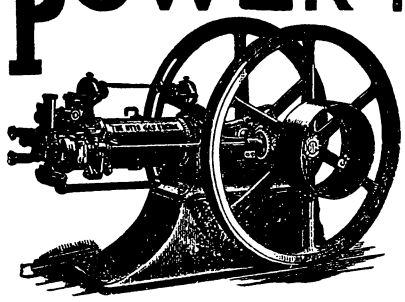

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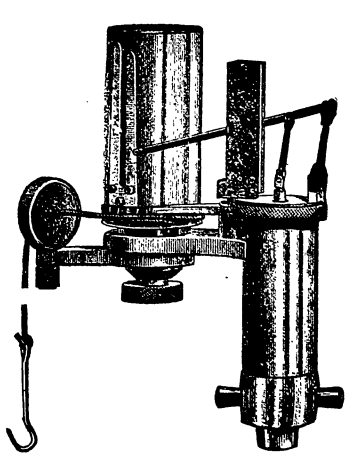

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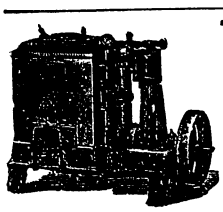

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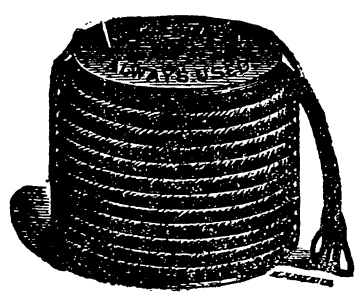

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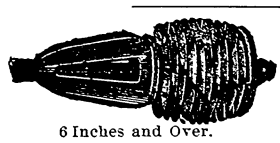

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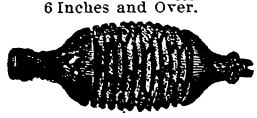

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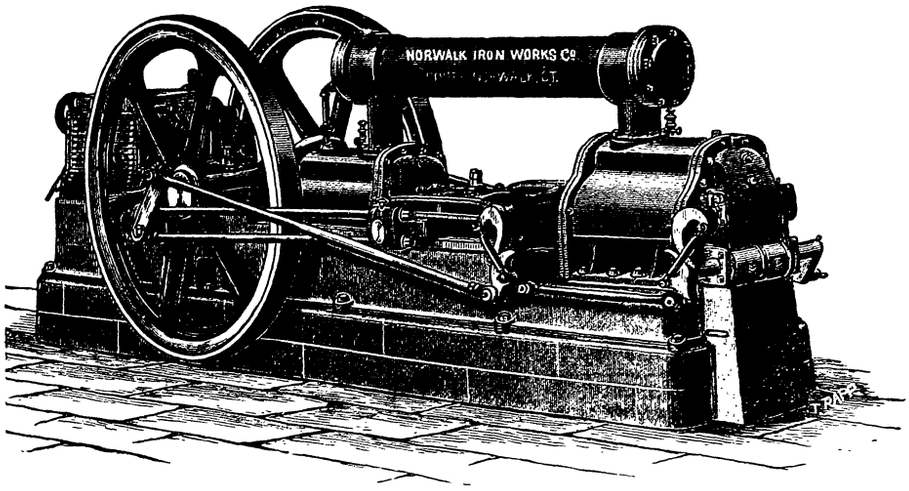


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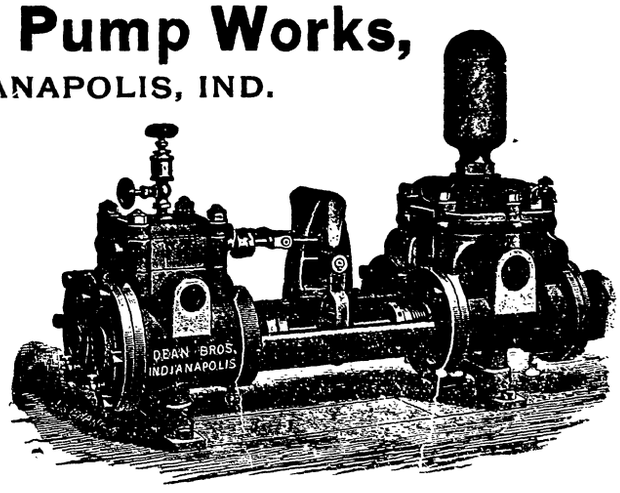



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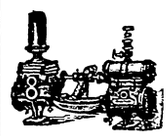
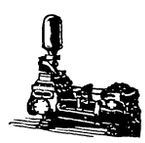


Send for Prices.



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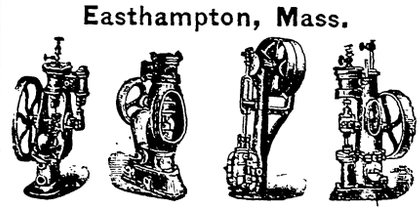

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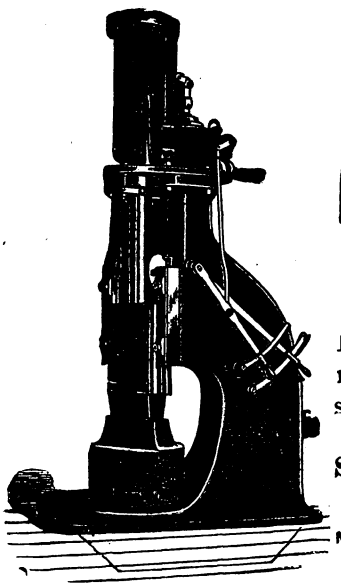

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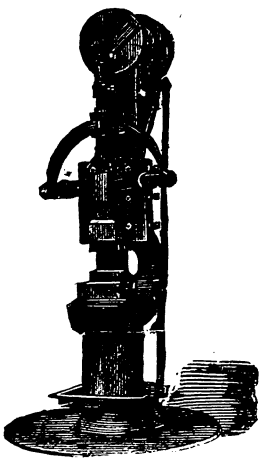

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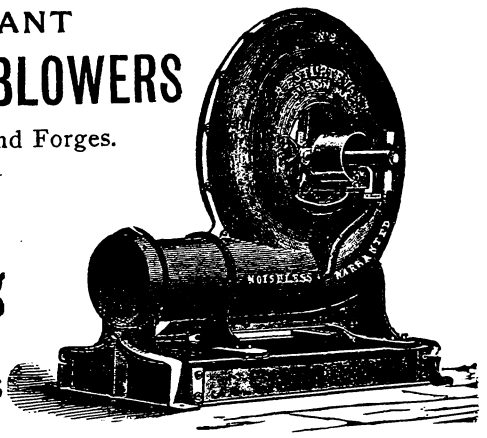

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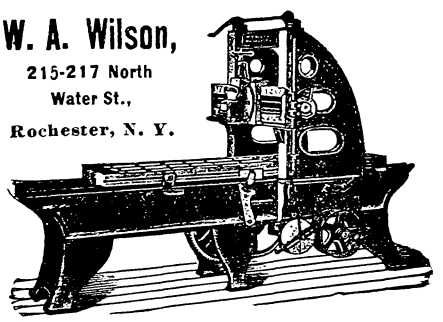

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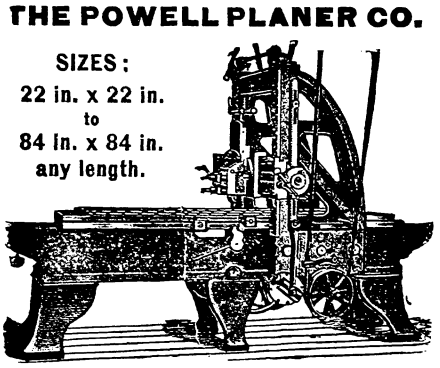

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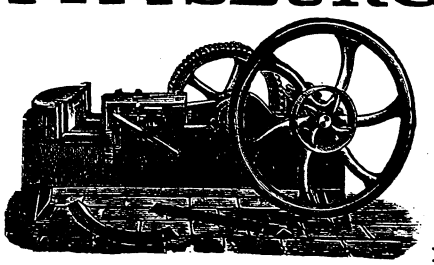

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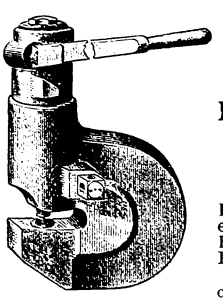

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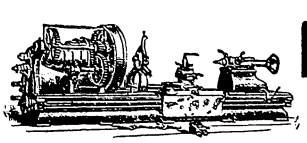

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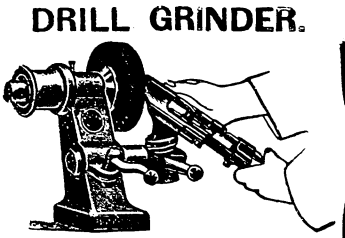

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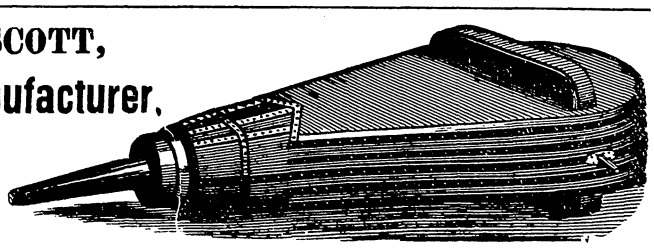

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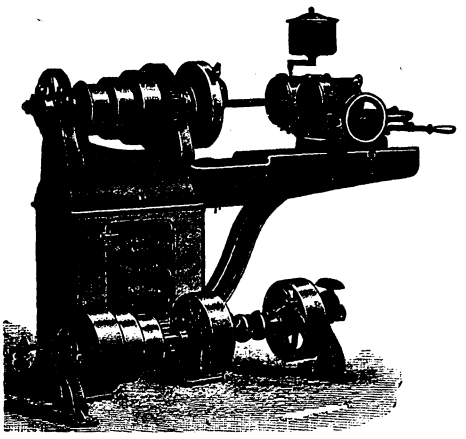

This machine has the very great advantage of opening-dies, which do not need to be adjusted, but stand always ready for work and instantly release the bolt when threaded, without being run back over the screw, thereby saving nearly enough time to thread another bolt, and also saving much wear on the dies. By simply turning the hand wheel the dies separate and the work can be taken out.

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### *If You Wish to Avoid*

A Pipe-Threading Die extremely easy of operation by reason of the **proper clearance** of its cutters;

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***If by chance you do not think these points, or the saving of money, objectionable,***

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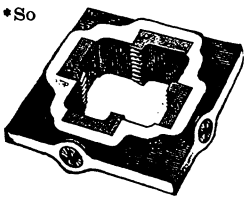

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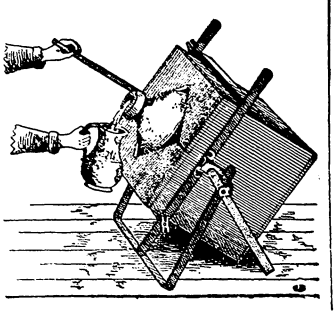

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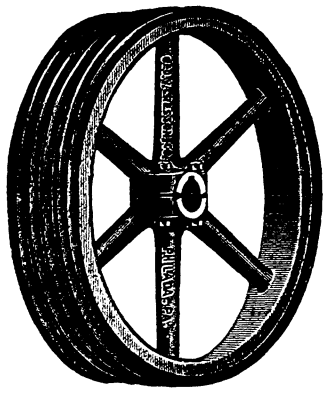

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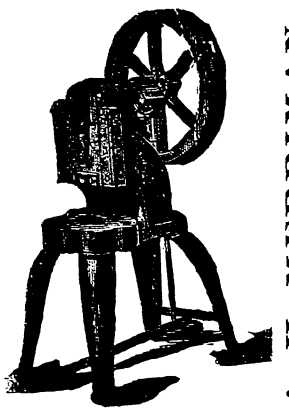

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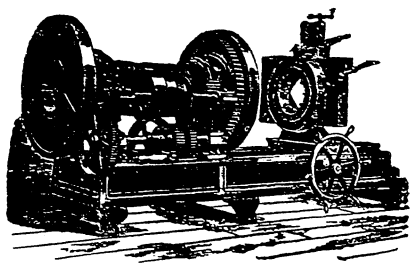

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**Our Prices are Low and our Goods are the Best.**

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No. 1, Upsets 3 x ⅝ and smaller.
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IT IS WITHOUT A FAULT. ONE MOTION DOES IT ALL.

Every machine is tested and warranted to give satisfaction. We confidently offer this Upsetter as the best to be had. Send for Price.

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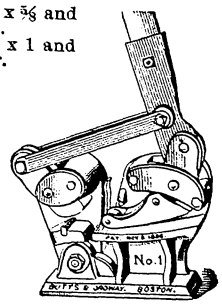
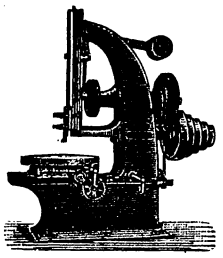
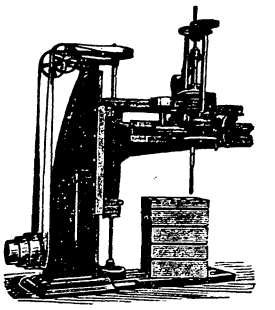




# William Sellers & Co., Incorp.

**PHILADELPHIA, PA.,**

——MANUFACTURERS OF——



**Improved Machine Tools for Working Iron and Steel,**
**High Speed Power Traveling and Swing Cranes,**
**Injectors, Locomotive Turn Tables, Shafting, &c., &c.**
**Testing Machines, under patents of A. H. Emery.**

**Prices, Descriptive Matter, &c., Furnished on Application.**

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## MORSE, WILLIAMS & CO.

Morse Elevator Works.

MANUFACTURERS AND BUILDERS OF

**ELECTRIC, HYDRAULIC, BELT and HAND POWER PASSENGER and FREIGHT**

# ELEVATORS.

1105 Frankford Ave., Philadelphia. 108 Liberty St., New York.
1116 E. St., N. W., Washington, D.C. 33 Lincoln St., Boston.
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## J. G. SPEIDEL,

807 & 809 CHERRY STREET,
**READING, PA.,**
Patentee and Manufacturer of the celebrated

**Economic Safety Hoist.**

**500 to 30,000 Lbs. Capacity.**
Has been awarded the John Scott Medal and Premium by the Franklin Institute of the City of Philadelphia for **Highest Efficiency, Simplicity and Durability.**

One man can lift two to three times as fast as with any other self-holding chain hoist. It has two speeds, is built strong and durable, and guaranteed to give satisfaction.

**TRAVELING AND SWING CRANES** up to 30,000 lbs. capacity and 50 ft. span. **Overhead Tramway, with Trolleys, Switches, &c. Elevators and Special Hoisting Machinery.**
Illustrated Cat. and Prices on application.

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# FAIRMOUNT MACHINE CO.,

**(Successors to Thomas Wood & Co.)**

Twenty-second and Wood Sts., Philadelphia, Pa.

**Shafting, Gearing, Self-Oiling Bearings, Friction Pulleys, Elevators.**

Rope Transmission ; Sheave Wheels, any size required, for Hemp, Manila and Cotton Rope Driving. Looms, Cotton and Woolen Machinery for Winding, Spooling, Reeling, Beaming, Warping, Dyeing, Sizing, Scouring &c.

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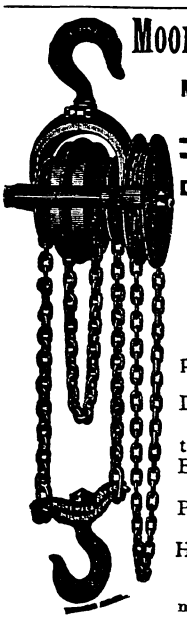

## Moore Mfg. & Fdry. Co.,

**Milwaukee, Wis., U. S. A.,**
Manufacturers of
**Moore's Anti-Friction Differential Chain Pulley Block.**

A New Movement!
A Perpetual Compound Lever!
Powerful, Simple and Durable!
One Man Can Lift to the Full Capacity of the Block.
Self-Sustaining at Any Point.
The Block Always Hangs Plumb.

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## = = OPEN-SIDE PLANERS. = =

READY FOR IMMEDIATE AND PROMPT DELIVERY.

Size C (30 in. x 30 in.), to plane 6 feet long.
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Size F (48 in. x 48 in.), to plane 14 feet long with extra side head.
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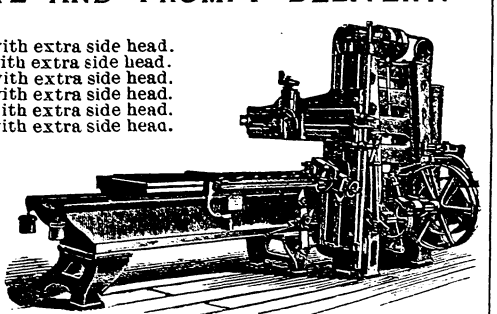

**DETRICK & HARVEY MACHINE CO,**
MANUFACTURERS,
**BALTIMORE, - - MD**

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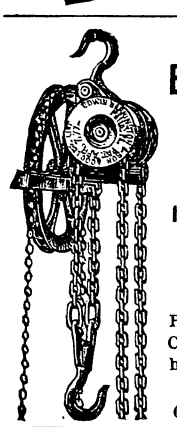

ESTABLISHED 1867.

## E. Harrington, Son & Co., Incorporated.

**Works and office:**
**1508 Pennsylvania Ave.,**
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Lathes, Planers,' Drill Presses, &c. Patent Double Chain Screw Hoists, Overhead Tramway-Switch, &c.

Gear Cutting a Specialty.

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## Highest Efficiency.

**WESTON'S NEW**

# TRIPLEX Chain Block

far excels all predecessors. Send for Prof. Thurston's report of comparative tests of *all chain pulley* blocks.

**The Yale & Towne Mfg. Co.**
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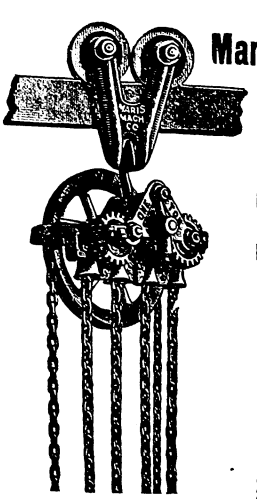

## Maris & Beekley,

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MANUFACTURERS OF

# CRANES,

**Power Bridge Cranes, Hand Bridge Cranes, Jib Cranes.**

**Portable Hoist**
Holds load at any point.

**Overhead Track, Trolleys, Switches.**

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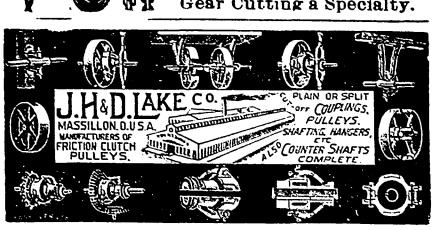

# SECOND-HAND MACHINERY.

**Modern Style. A1 Order. Low Prices.**

**ENGINE LATHES.**

13 in. x 6 ft. Blaisdell. Good order.
14 in. x 8 ft. Fitchburg. A1 order.
15 in. x 6 ft. Perkins. A1 order.
16 in. x 6 ft. New Haven. Fair. Cheap.
16 in. x 7 ft. Bridgeport. Good order.
16 in. x 8 ft. Ames. Good order.
18 in. x 8 ft. Putnam. A1 order.
20 in. x 8 ft. " "
20 in. x 8 ft. Rowland. "
20 in. x 7 ft. Steam Engine Co. Good order.
24 in. x 12 ft. Putnam. A1 order.
30 in. x 14 ft. Improved Style. A1 order.
38 in. x 18 ft. " " "

**PLANERS.**

35 in. wide, 7 ft. Hewes & Phil. Good. Cheap.
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21 " " 4 ft. Whitcomb. Good order.
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15 " " 3 ft. Screw. Good order.

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6 in. Stroke, Crank. Good. Cheap.
8 in. " " Gould. Good.
12 in. " " Prentiss. A1 order.
15 in. " " Improved. "
15 in. " " Friction, Hendey. Good.

**MISCELLANEOUS.**

Upright Drill, 20 in. Wheel feed. A1.
" " 24 in. Complete, Ames. Good.
" " 40 in. " New Haven. A1.
Radial Drill, 6 ft. Arm. Good order.
Milling Machine. Lincoln. Good order.
" " Universal. "Improved Style."
Screw Machine, No. 1, "Brown & Sharpe." Wire feed.
" " No. 1, "Garvin." Auto. Chuck.
" " 1⅛ in. hole, "Niles." Complete.
Upright Boring and Turning Mill, 38 in. A1.
Vertical Turret Chucking Mch., No. 2. B. & S.
Bolt Cutters and Pipe Cutters.
Boiler Bending Rolls, "Improved Style," 8 and 10 ft., with "Hinged Housings."

## J. J. McCabe,

**14 Dey Street, - New York.**

Successor to E. P. BULLARD'S N. Y. Machinery Warerooms.

# For Sale Cheap.

Special lot of

## NEW ENGINE LATHES,

**ANY LENGTH OF BED.**

**Sizes 13, 15, 17, 20 and 22 in.**

ADDRESS

**Draper Machine Tool Co.,**

Successors to

LATHE & MORSE TOOL CO.,

**130 Gold Street, WORCESTER, MASS.**

## WANTED.

Responsible parties to manufacture and sell on royalty, a cheap portable steel or iron ***CULVERT BRIDGE;*** it is adapted to all small streams, runs, etc., in roads, streets, ***RAILROADS,*** etc.; improved roads is the order of the day; use this bridge, put it below the level of the road, cover it over and thus prevent jarring and wear and tear of vehicles, etc Apply to W. A. NICHOLS,
Girard Building, Philadelphia, Pa.

## STEAM PUMPS FOR SALE.

We have on hand
One new Worthington Pump, 7½ x 4½ x 10.
Also two second-hand Pumps, in good order.
One Smith Vaile, 6 x 4 x 6.
One Knowles, 6 x 3¾ x 6.

**HOOKER-COLVILLE STEAM PUMP CO.**
St. Louis, Mo.

Send for descriptive catalogue of Hooker Pumping Machinery.

## FOR SALE.

1 Engine Lathe, 24 in. swing x 25 ft. bed Modern. First-class condition.
1 Lincoln Miller. Good order.
1 3 in. Cutting-off Machine. Nearly new.
1 No. 1, No. 2 and No. 6 Root's Blower.
Prices very reasonable.

COOKE & CO.,
163 and 165 Washington St., New York.

## FOR SALE.

Wright Automatic Engine (Poppet Valve) 16 in. x 36.

F. McSWEGAN & SONS,
Dover St. and Franklin Square, New York.

# BARGAINS.

**Second-hand Machinery. Good Condition.**

1 2500-lb. Double Frame Steam Hammer. Fdk. Miles.
1 Planer 32 in. x 32 in. x 11 ft. Double head.
1 250-lb. Justice & Shaw Dead Stroke Hammer.
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1 "Hendey" Engine Lathe, 18 in. x 10 ft.
2 Bement Milling Machines.
1 Niles Screw Machine No 2.
1 40 in. Harrington Drill Press, B. G. & P. F.
3 28-in. Schumacher Drill Presses, B. G. & P. F.
1 40-in. Schumacher Drill Press, B. G. & P. F.
1 48-in. Drill Press, B. G. & P. F.
1 Power Punch; capacity, ½-in. hole in ½-in. iron. Throat 6 in. Parker, Snow & Co.
1 20 in. x 48 in. People's Works Horizontal Engine.
6, 8, 10, 15, 25 and 40 H.-P. Hoisting Engines.
1 60 in. x 15 ft. Hor. R. T. Boiler. Complete. 75 H.-P.
1 48 in. x 16 ft. Hor. R. T. Boiler. Complete. 50 H. P.

**L. F. SEYFERT'S SONS,**
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# METAL WORKING MACHINERY.

**All kinds.**

**NEW AND SECOND HAND.**

## 600 Machine Tools in Stock.

**Send for lists of Second-hand Machinery and Secure Bargains.**

## PRENTISS TOOL & SUPPLY CO.,

**115 Liberty Street, NEW YORK.**

**59 South Canal Street, CHICAGO, ILL.**

PLANER, 24 in. x 20 in. x 5 ft., table. Good order $150.00
PLANER, 30 in. x 30 in. x 6 ft., with chuck. Good order ..... 200.00
Lathe, 30 in. x 18½ ft. Excellent order..... 450.00
36 in. x 24 ft. Bg. G'd. Sc. Cut'g Gleason Lathe. Good order..... 475.00
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26-in. Hvy. Drill Press, Back G'd. Good as new. 125.00
38 in. Bg. Gd. Drill, heavy. Good as new .... 275.00
14-in. Heavy Fitchburg Shaper. Fair order.... 150.00
2½-in. Heavy Lever Feed Drill. New..... 50.00
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Power Punch Presses.....$75.00 and upward.

**AMER. TOOL WORKS. Cleveland, O.**

## SECOND-HAND MACHINISTS' TOOLS.

1 Planer, planes 15 ft. 42 in. x 42 in.
1 Planer, planes 6 ft. 32 in. x 25 in.
1 Planer, planes 8 ft. 24 in. x 24 in.
1 Planer, planes 5 ft. 24 in. x 24 in.
1 Planer, planes 4 ft. 24 in. x 24 in.
1 Crank Planer, 2 ft. 18 in. x 12 in. A1.
1 Engine Lathe, 18 ft. bed, 82 in. swing, for Boring and Turning.
1 Engine Lathe, 20 ft. bed, 60 in. swing, old style, cheap.
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1 10 ft. 17 in. Lathe.
3 6 ft. 14 in. Blaisdell Lathes.
2 6 ft. 15 in. Wood & Light Lathes.
1 Pratt & Whitney Cushioned Hammer.
1 475 lb. Drop Hammer, Merrill Pattern.
1 No. 21 Bliss Press.
2 20-in. Wheel and Lever Feed Drills.
1 28 in Upright Plain Drill. Cheap.
1 1 H.-P. Shipman Engine.
**And various other tools.**

**NEW YORK MACHINERY DEPOT,**
**Bridge Store No. 16, on Frankfort St., New York.**

## FOR SALE OR HIRE.

Engines with Cylinders 26 in. x 48 in. and smaller.
Portable, Tubular and Vertical Boilers of all sizes.
13 2-yard 3-ft. gauge all around Dump Cars.
7 Narrow Gauge and 2 Standard Gauge Locomotives.
1 Large Worthington Duplex and other Pressure Pumps. New and Second hand.
Hoisting Engines and Grinding Pans.
Rail, Sheet and Clipping Shears.

**THOMAS CARLIN'S SONS,**
**Allegheny, Pa.**

**FOR**

# MACHINERY

**ADDRESS US.**

**Pennsylvania Mch. Co., Ltd.,**

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# Machinery,

**Second-Hand and New, on Hand.**

No 4, 3, 2 Stiles Punch Presses.
No. 1½ and 0 Fowler Punch Presses.
No. 1 and 2 3-Screw Machines, Pratt & Whitney.
No. 1 Profiling Machine, " "
No 3 Hand Miller, " "
15 x 5 Eng. Lathe, Taper Attch., " "
16 x 5 x 6 Eng. Lathe, Bridgeport Mch. Tool Wks.
200 lb. Drop Hammer, Bliss.

**Magnetic Separating Machine, Dynamo for Electro-plating, Shaping, Planing, Slotting Machines, all Sizes.**

Engine Lathes from 11 inch Swing to 90 inch Swing.
Drill Presses, Regular, from 10 to 44 inch Swing.
" " Radial, H. & Jones, 48 "
Gang Drills, 2 Spindle and 4 Spindle.
Lot of Special Drills for Butt Drilling.
Special Butt Milling Machine.
No. 12 Turret Lathe, 3¼ inch hole, Jones & Lamson.
No 12 " " 24 inch Swing by 8 ft. Bed, Am. T. & Mch. Co.
Lot of Polishing Mchy., Leather Covered Wheels, etc.
Belting, Pulleys, Engines, etc., etc.

**Boiler Shop Outfit of Machinery.**

**Send for our latest list or state what is required.**

**Warehouse, 511 & 513 West 13th St.**
**Office, 120 Broadway, New York.**

**Geo. Place Machine Co.**

## ONE GONE; TWO ARE LEFT.

Last week we offered 1 100 H.-P. and 2 80 H.-P. **TUBULAR BOILERS**; the 100 H. P. has been **SOLD.** The 2 80 H.-P. remaining are alike, are 60 in. diameter by 16 ft. long, have 36 4½ in. tubes, full arch fronts, and fitted with **McCLAVE GRATES** and Blowers. Are in perfect condition.

**THE SCRANTON SUPPLY & MACHINERY CO.,**
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## For Sale, Very Low for Cash.

500 tons Relaying Steel Street Rails, side bearing, 35 to 47 lb. sections. Also 65-lb. Steel T's.

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2 Stokes & Parrish 7 in. x 9 in. Hoisting Engines.
3 No. 7 Knowles Pumps.
1 Worthington Duplex Pump, 10 x 6 x 10 in.
Lot 30 and 36 in. Plain Cylinder Boilers.
Lot I Beams, Stacks &c.
At Merion Furnaces, West Conshohocken, Pa.
Apply for particulars to

POULTERER & COMPANY,
No. 26 Bullitt Building, Philadelphia, Pa.

## SEE HERE!

1 each Garvin No. 2 & No. 4 Milling Machines, 2d hand.
1 Pratt & Whitney Lincoln Miller No. 3, 2d hand.
1 " " 19 x 6 Engine Lathe, " "
1 each Lodge & Davis, 21 x 8 and 21 x 10 do., 2d hand.
1 Dietz Gang 22 x 8 Engine Lathe, 2d hand.
1 New Haven 28 x 8 " " " "
1 Dietz Gang 80 in. Radial Drill, " "
1 20 in. Lever Drill, new.
1 each Lodge & Davis 15 in. and 20 in. Shaper, new.
1 Gear Cutter, will cut up to 40 in., 2d hand.
1 Baker Bros. Universal Saw Bench, new.
A full line of the most improved Turret Lathes.

**THE LODGE & SHIPLEY MACHINE TOOL CO.,**
107-113 Culvert St., Cincinnati, Ohio.

## FOR SALE.

Hand-power traveling crane, 16-foot span, with racking gear and brake. Low price. Terms cash. THE SARGENT CO.,
Chicago, Ill.

## WANTED.

A second-hand 8 in. Guide Train; must be in first-class condition. Address, giving full description, price, etc., COMPANIA INDUSTRIAL MEXICANA, Chihuahua, Mexico.

# Great Bargains.

## Must be Sold and Removed.

16 in. x 30 in. Horizontal Engine.
18 in. x 36 in. Horizontal Engine.
24 in. x 36 in. Horizontal Engine.
19½ in. x 48 in. Beam Engine, with Knowles Condenser.

Write us for what you want.

**LOVEGROVE & CO.,**
Third and Quarry Sts., Philadelphia, Pa.

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SECOND-HAND
# MACHINERY.

One American Tool Co.'s No. 2 Cabinet Turret Lathe, with slide rest; in fine order.
One Pratt & Whitney 36-in. Gap Chucking Lathe.
One Pratt & Whitney No. 3 Lincoln Milling Machine.
One Iron Planer, 52 in. wide, 44 in. high, 12 ft. long, with two heads.
One Springfield Universal Grinding Machine No. 3, swing 18½ in. over the ways and take 6 ft. between centers. Has been used but a very few times and is practically new.
One L. W. Pond Gear Cutter, to cut gears 36 in. diameter, 5 in. face, also arranged for cutting beveled gears.

**HILL, CLARKE & CO.,**
156 Oliver St., Boston, Mass.
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HERE ARE SOME
# BARGAINS
IN SECOND HAND MACHINERY

**from the equipment of the United Electric Traction Company's Works of Marion, N. J., comprising:**

Reed, Prentice, Ames, Jones & Lamson and other Engine Lathes, 14 in. to 20 in. swing.
1 48 in. x 18 ft. Pond M. T. Co.'s Engine Lathe.
1 11 in. Newton Slotter.
1 No. 2 Betts Horizontal Boring Mill, with lot of fixtures.
1 each 36 in., 48 in. and 60 in. Gould & Eberhardt Automatic Gear Cutters.
1 24 in. x 5 ft. Pond M. T. Co.'s Planer.
Shapers, 10 in., 12 in. and 15 in. stroke.
Drill Presses up to 25 in. swing.
Milling Machine, Plain and Universal.
2 Brown & Sharpe Screw Machines.
2 Large Bliss Power Presses.
Hand Lathes, 10 in. to 20 in. swing.
1 10 H.-P. Baxter Engine, with 15 H.-P Boiler, complete. Good as new.
Also Tool Grinders, Die Sinkers, Tapping Machines, Bolt Cutters and Large Pattern and Blacksmith's Shop Equipments.
The tools are in excellent order and of the best makes. They will be sold at remarkably low prices.
Call at our salesroom and inspect them, or write for complete descriptive circular and price-list.

**THE GARVIN MACHINE CO.,**
Laight and Canal Sts., New York.

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**SOME BARGAINS HERE.**

1 Hendey Shaper, 15 in. stroke, imp. vise.
1 14 x 6 Screw Cutting Engine Lathe. New.
1 5 in. hole in Turret Screw Machine and Counter, $25.
2½ Hendey Cutting-off Machine. New.
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100 H.-P. Woodbury Engine. 2d-hand Good order.
2 50 H.-P. Woodbury Boilers. Good order.
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75 H.-P. Ball Engine. 2d-hand. Good condition.
Also variety of Engines, Boiler Pumps, &c.
And other machinery, new and second hand. Write for prices. **Machinists' Supply Company,**
39, 41 and 43 Central Ave., Rochester, N. Y.

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**FOR SALE.**

Iron Stack nearly new, 64 in. diameter, 110 ft. high. Cheap.
FRANK TOOMEY,
131 North 3d St., Phila., Pa.

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# RAILS
FOR RELAYING.

10 tons 80 pound Steel T's.
65 tons 65 pound Steel T's.
50 tons 40 pound Iron T's.
650 tons 35 pound Iron T's.
250 tons 30 pound Iron T's.
10 tons 25 pound Steel T's.

## STEAM ROCK DRILLS.

2 No. 4 Rands, with Tripods.
1 No. 3½ Ingersoll, with Tripod.
1 Bullock Diamond Drill for hand or power. Nearly new.
Send for new list of good things.

**THOS. P. CONARD,**
206 Walnut Place, Philadelphia.

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**WE ARE OFFERING BARGAINS IN THE FOLLOWING PIECES OF SECOND-HAND MACHINERY.**

14 x 18 High Speed Engine, 2 wheels 60 in. dia., 14 in. face.
18 x 48 Corliss Engine, wheel 16 ft. dia., 25 in. face.
16 x 48 Corliss Engine, wheel 16 ft. dia.. 9 tons.
2 Horizontal Tubular Boilers, 5 ft. dia. x 17 ft. long.
7 Horizontal Tubular Boilers, 5 ft. dia. x 15 ft. long.
Smith Valve Compound Duplex Pump. 14-20 x 15 x 15
Worthington Compound Duplex Pump, 10-16 x 10¼ x 10.
Davidson Pump, 24 x 12 x 24.
500 H.-P. J. P. Witherow, Pittsburgh, Pa., Heater.
Edison Dynamos of 75, 150, and 300 lights, with lamps, sockets, switches, wire, &c.

**MARVIN BRIGGS, 12 Broadway, N. Y.**

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## SECOND-HAND MACHINERY.

2 11 in. x 5 ft. Reed Engine Lathes.
2 11 in. x 5 ft. Prentice Lathes.
2 12 in. x 5 ft. Young Speed Lathes.
2 13 in. x 5 ft. Ames special feature Lathes.
2 15 in. x 6 ft. Reed Engine Lathes.
1 15 in. x 8 ft. Young Lathe.
1 16 in. x 6 ft. Young Lathe.
1 16 in. x 6 ft. Perkins Lathe.
2 16 in. x 6 ft. Blaisdell Lathes.
1 16 in. x 6 ft. Flather Lathe.
1 18 in. x 8 ft. New Haven Lathe.
1 18 in. x 8 ft. Dustin Lathe.
2 20 in. x 6 ft. Bullard Lathes.
1 26 in. x 10 ft. Dustin Lathe.
2 20 in. x 8 ft. Bullard.
1 20 in. x 10 ft. Bullard.
1 26 in. x 13 ft. New Haven
1 Dexter Pattern Lathe.
1 Bullard Turret Lathe.
2 Brainard No. 7 Overh'ging Arm Plain Millers
2 Brainard No. 7 Lincoln Plain Millers.
1 B. & S. No. 1 Universal
1 Brainard Heavy No. 6 Lincoln Pattern Miller.
1 Garvin No. 2 Miller and Screw Slotter.
1 No. 3 Garvin Plain Miller.
1 38 x 18 ft. N. Y. S. E. Lathe.
1 Garvin No. 4 Rack Feed Miller.
1 Brainard No. 15 Universal Miller.
2 Brainard No. 5 Universal Millers.
1 Blaisdell 30 in. Single Spindle Drill.
1 Wilder Punch Press.
1 Grindstone and Frame.
1 Garvin one-spindle Profiling Machine.
1 Garvin No. 2 three-spindle drill.
1 Garvin No. 3 four-spindle Drill.
1 Garvin No. 4 four-spindle Drill.
1 Garvin No. 2 Wire Feed Screw Machine.
1 Garvin No. 2 Plain Screw Machine.
1 Garvin Small Gear Cutter.
1 Dustin 18 in. wheel feed one-spindle Drill.
1 Brainard Universal Cutter Grinder.
1 Band Saw.
1 Diamond No. 3 Emery Grinder on column.
1 Diamond Polishing Head.
1 Bullard 15 in. stroke Shaper.
1 16 in. Smith & Mills Shaper.
1 24 in. x 24 in. x 6 ft. New Haven Planer.
1 10 ft. Boring Mill.
1 8 ft. 4 in. Boring Mill.
1 76 in. x 60 in. x 13 ft. Planer.
1 48 in. Car Wheel Borer.
1 Axle Lathe.
Also large stock of New Tools.

**NILES TOOL WORKS CO.,**
136 & 138 Liberty St., N. Y. City.

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**MACHINERY, TOOLS, &c.**

Engines, all sizes, Slide Valve and Automatic.
Boilers, all sizes, Horizontal, Vertical and Locomotive.
Hoisting Engines, Portable Engines, Steam Pumps.
20 Screw Cutting Lathes, 12 in. to 24 in. swing.
20 Bement Milling Machines.
24 in., 30 in. and 36 in. Planers, 6 in., 12 in. and 15 in. Shapers.
44 in. Radial Drill, 1⅛ in. National Bolt Cutter.
Power Shears, ⅛ in. iron, 15 in. Gap.
Hydraulic and Punching Presses.
10 lbs., 25 lbs., 60 lbs. hammers for belt.
4½ Pratt and Whitney cut-off machine.
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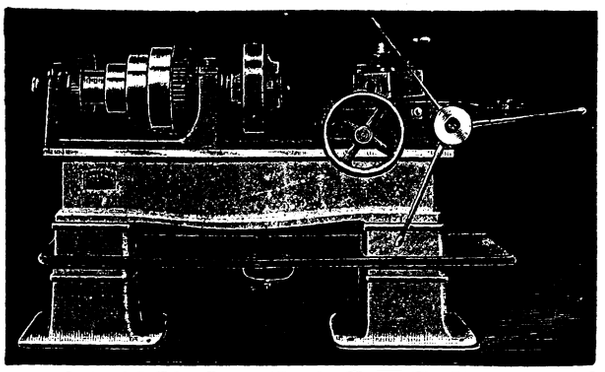

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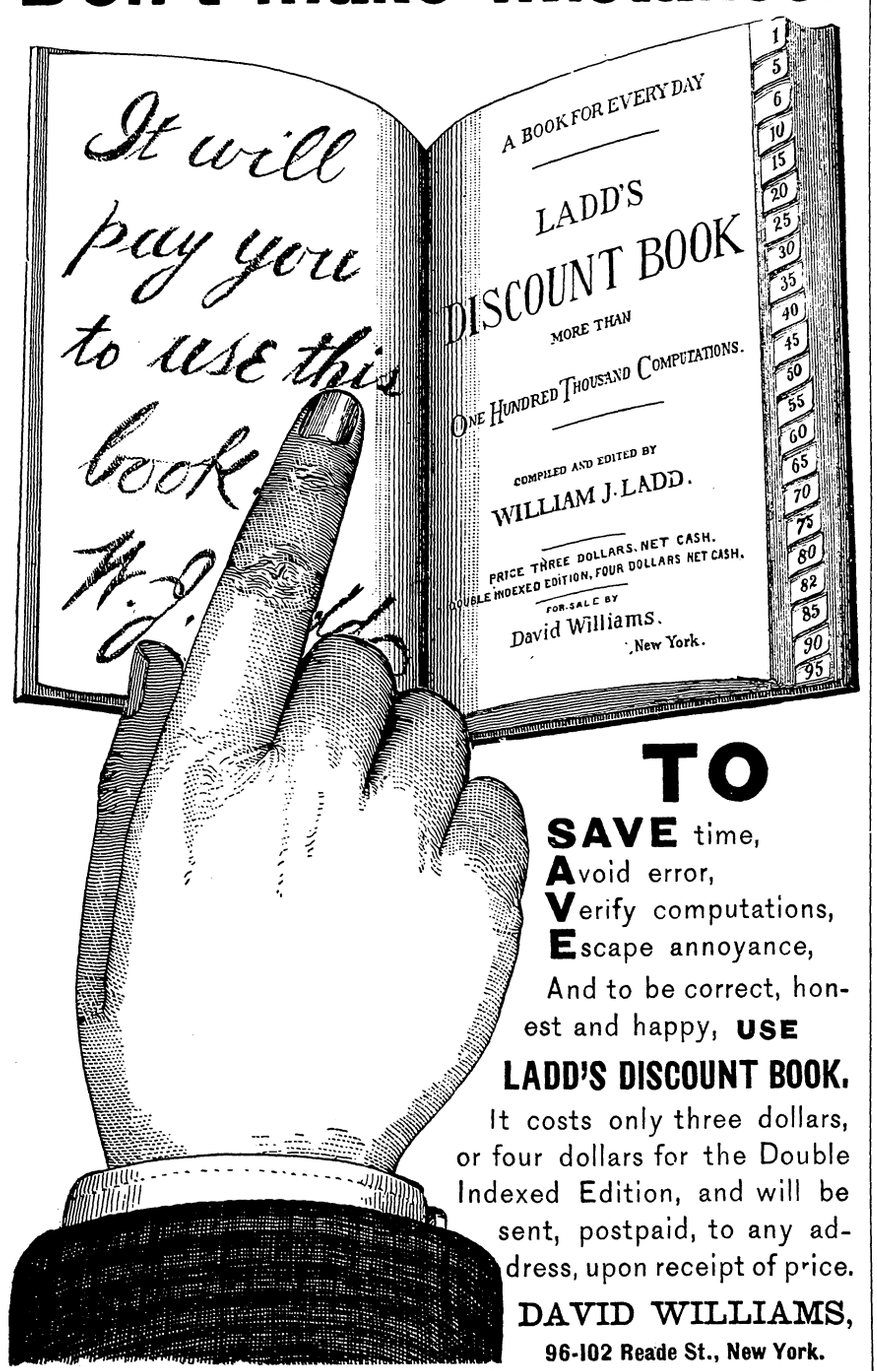


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Make the same entry but once. A Ledger in place of a full set of books. Convenient forms for all entries. Easily applied, simple, saves time. West's Self-Proving Balance locates every error. Send 3 2-cent Stamps for illustrated 16-page pamphlet.

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**The Scattergood Time Record and Pay Roll Book.**
(Pat. Oct. 13, 1891.)
Address for Circular to
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**A NIAGARA DYNAMO OR MOTOR**

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MANUFACTURERS OF
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Unionville, Conn.,
Manufacturers of
**AUTOMATIC COLD PRESS NUT MACHINES**
FOR MAKING CHAMFERED AND TRIMMED NUTS.
Correspondence Solicited.

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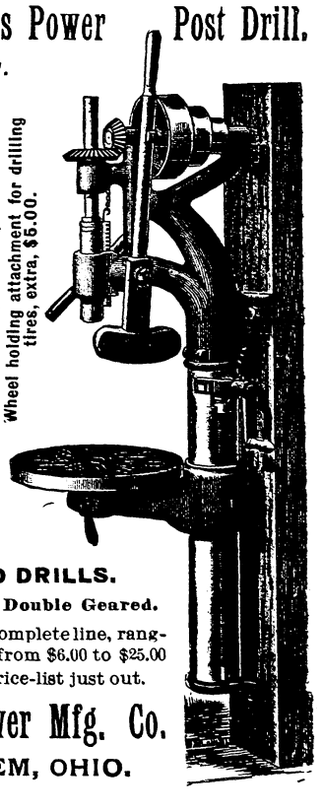
**Silver's Power Post Drill.**

FIG. 727.



Has CUT GEARS, and is a thoroughly first-class tool in all respects. Dia. Column, 4½ in.; Dia. Spindle, 1 3-16 in.; and bored No. 2 Morse Taper; Vertical Travel, 6 in.; Drills to centre 19 in. circle.

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Wheel holding attachment for drilling tires, extra, $5.00.

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**Single and Double Geared.**

Large and complete line, ranging in price from $6.00 to $25.00 list. New price-list just out.

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**IF SO, THE PRICES WE ARE MAKING ON**

**OIL HEATERS AND GAS STOVES**

**WILL INTEREST YOU.**

## B. & B. Stoves are the Leaders.

**B & B. Combination Oil Heaters and Cook Stoves are a great success,** as proven by the many testimonials received from all parts of the country.

*Every Stove is mounted on rollers,* and can easily be moved from room to room. *They can be used in place of a range in the kitchen or in place of a base-burner in the parlor.* They are thoroughly well adapted to fill all requirements, *combining as they do all the qualities of a first-class Oil Heater and an elegant Parlor Cook Stove.*

If you happen to have one of them upstairs, *the tank can easily be removed and taken down to the kitchen to be filled,* and again replaced in the Stove.

Those who have used the old style Stove with tanks fastened in them as tight as if cast in the iron will appreciate this feature. They can be fitted with our 2-hole, 3-hole or 4-hole Extension Tops for regular 8-inch ware. We want your trade. and if you will give us a chance to quote you prices we will have it.


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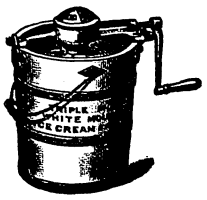

The standard by which the merits of a Freezer are gauged is, how near it comes to being as perfect as the

## WHITE MOUNTAIN
### ICE CREAM FREEZER.

It always has been, and is still, the best. Try them.

Manufactured by **The White Mountain Freezer Co., Nashua, N. H.**

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has the reputation of being the **BEST ICE CREAM FREEZER** ever introduced. **STRENGTH, DURABILITY, NEATNESS AND EFFICIENCY** are prominent points in the manufacture. Full Size Can, **CEDAR TUB,** Detachable Hinged Crossbar, Self-adjusting Vibratory Scraper, etc.

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JAR ENTIRELY COVERED.
No more Spattering.

CAN BE USED ANYWHERE.
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ALWAYS READY FOR USE.
Nothing to be fixed.

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No. 20.—Jar holds 1 quart level full,
Complete Machine securely packed in one single package.
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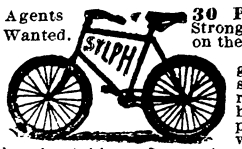


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Guaranteed highest grade, and built for scorchers and hard road riders. By using tubular hubs, front fork, saddle post, etc., we do away with forgings and use heavier tubing. Our system of lap-brazing makes joints as strong as any part of the tubing, and thus we get a lighter and by far stronger machine. Investigate. Catalogue free. **ROUSE-DURYEA CYCLE CO., 146 G St., Peoria, Ill.**

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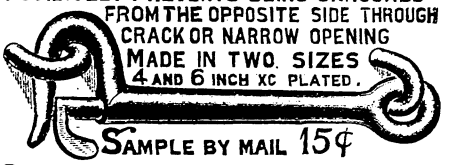
MADE IN TWO SIZES 4 AND 6 INCH XC PLATED.



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### Call for Our Banner Bolt Snap:

This snap has many important advantages over other makes of Bolt Snaps, viz.: It is lighter, the spring is entirely covered and protected from foreign substance and freezing, and is lower in price

Made in all sizes; Round, Loop and Open Eye. **We are headquarters** and the most extensive manufacturers in Saddlery, Coach and General Hardware Specialties.

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Electric Toy Making, Dynamo Building and Electric-Motor Construction. By T. O'Conor Sloane-A.M., E.M., Ph.D. This work treats of the making at home of electrical toys, electrical apparatus, motors, dynamos, and instruments in general and is designed to bring within the reach of young and old the manufacture of genuine and useful electrical appliances. The work is specially designed for amateurs and young folks. Very fully illustrated..... ..... ..... $1.00

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## Hardware Dealers Can Profitably Sell Bicycles.

There is a large trade in Bicycles in all parts of the country and much of that trade naturally belongs to dealers in hardware. Good bicycles meet with a ready sale and pay a fair percentage of profit.

## COLUMBIAS

Are the representative high grade machines in America. A Columbia is the easiest machine to sell to the best trade because it is unquestionably the standard wheel of the world.

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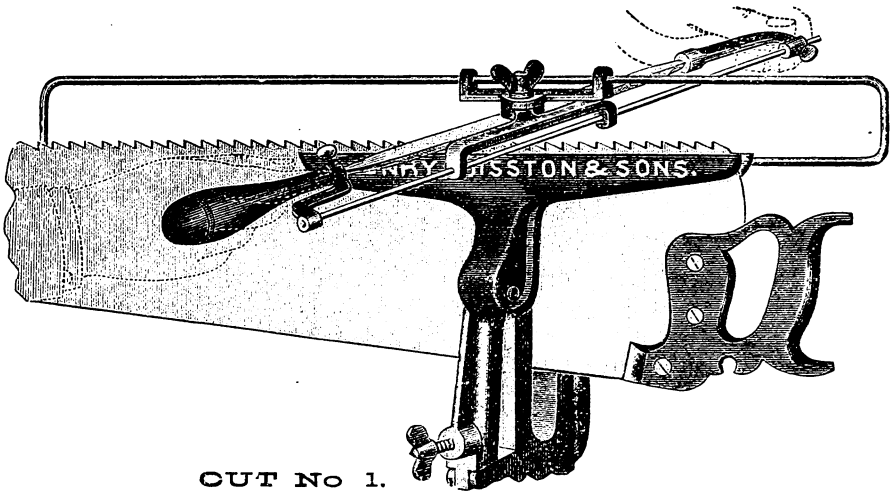
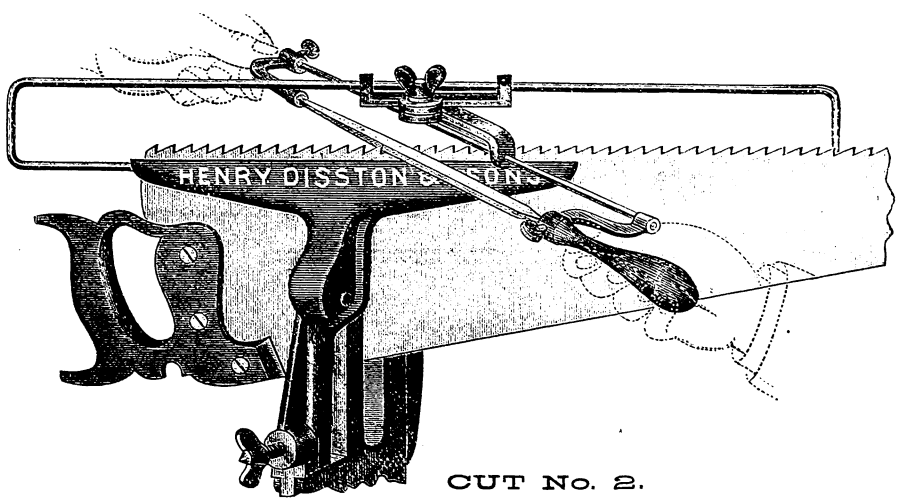
# DISSTON'S Improved Saw Clamp
## AND FILING GUIDE.

**ESPECIALLY DESIGNED TO ASSIST THOSE NOT SKILLED IN THE ART OF SAW FILING TO FILE A SAW CORRECTLY.**




CUT No 1.

Cut No. 1 shows a saw and the attachment in proper position for filing the first side; and Cut No. 2 shows the saw and attachment reversed and in position to file the second side. There are three marks on one of the hubs of the swivel attachment, and one mark on the other. One of the three marks shows when it is in position No. 1, and the other designates when it is in position as shown in No. 2. The third, or centre, marks show when it is in position for filing Rip Saws.



CUT No. 2.

To obtain the correct position, loosen the wing nut and move the guide around to the point desired; after tightening wing nut, loosen screw in file handle, then turn handle until file gives the shape tooth wanted.

A good way is to select a tooth of correct shape and let file down into it, tighten set screw in handle, then file a tooth to see if the shape suits. If not turn the file a little to the right or left and try another tooth until the proper shape is obtained. Then file every other tooth, see cut No. 1; when one side is filed, reverse saw and attachment and adjust as in No. 2, and file the other teeth. For Rip Saws, place the file at right angles with the saw and file every tooth Always keep the file as nearly horizontal as possible.

This filing guide is sold only attached to our No. 3 Improved Clamp or Vise, and not sold separately. We recommend this as the best saw clamp on the market, being quickly and easily adjusted, and not liable to get out of order.

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**Write for price including No. 3 Clamp, Filing Guide, File and Handle complete. Packed one in a wooden box**

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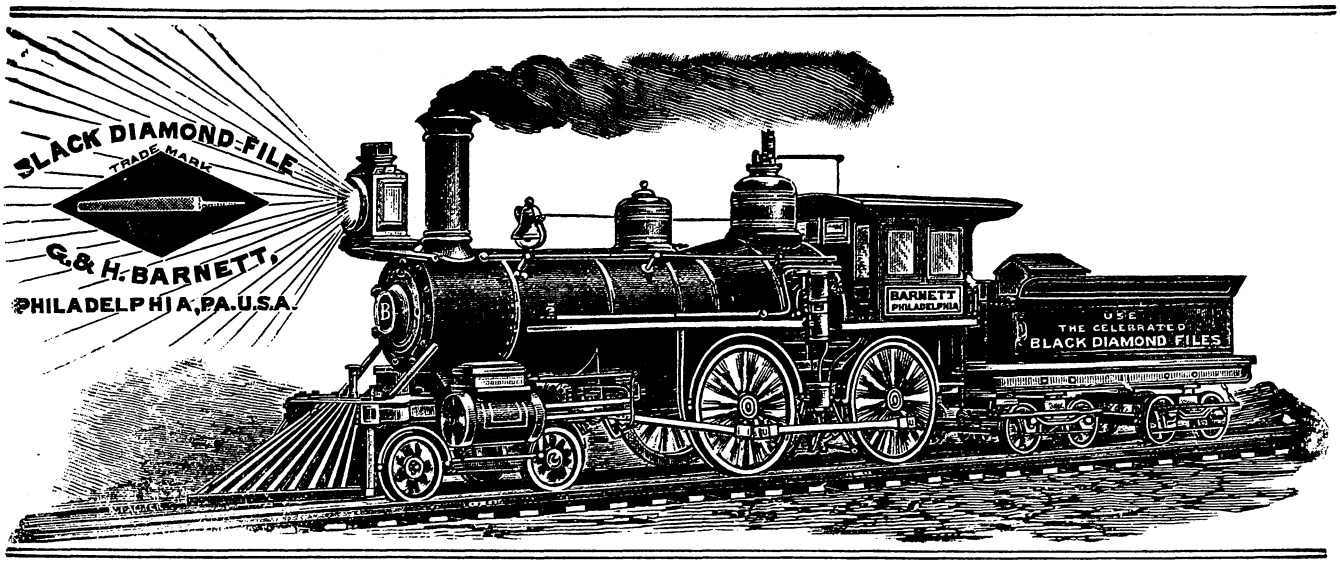
**Henry Disston & Sons,** INCORPORATED, **Philadelphia, Penn.**

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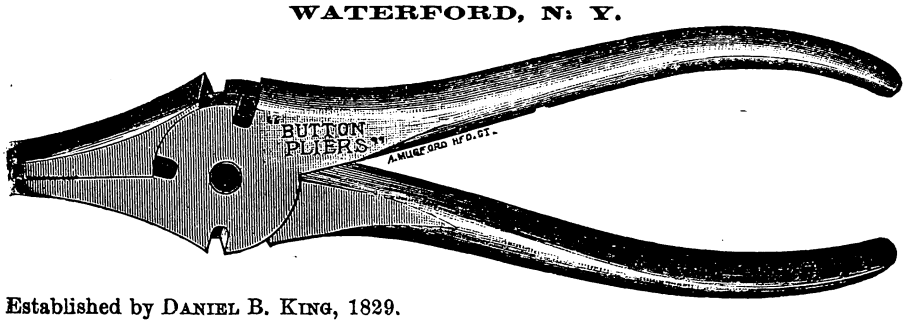
Manufacturers of

**BUTTON'S**

## Pat. Wire Cutter

**AND PLIER COMBINED.**

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Price-List on Application.

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***Superiority acknowledged wherever used, sold or exhibited.***

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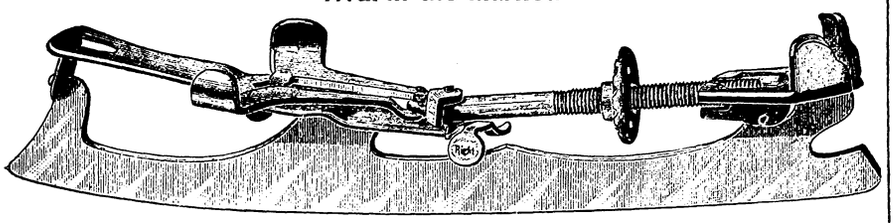
# THE LONG REACH SKATE

has stood a practical test for eight years and is absolutely without a rival in the market.



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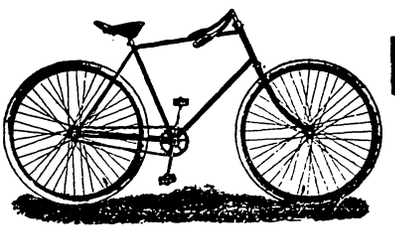
**BICYCLE**  **MANF'TRS**

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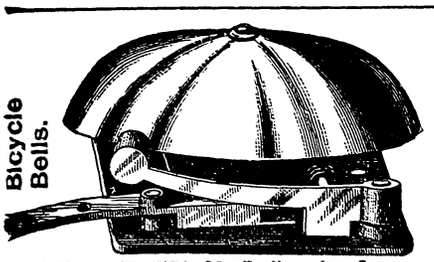


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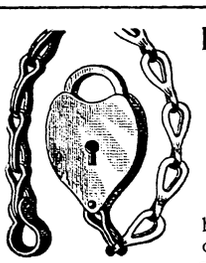

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We manufacture hardware specialties of all descriptions to order.

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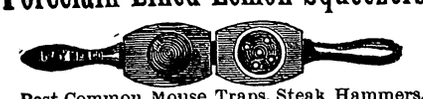

Best Common Mouse Traps, Steak Hammers, Boot Jacks, Lap Boards, Beacon Hill Pat. Mouse Traps, Mallets, Bung Starters, Hand Screws.

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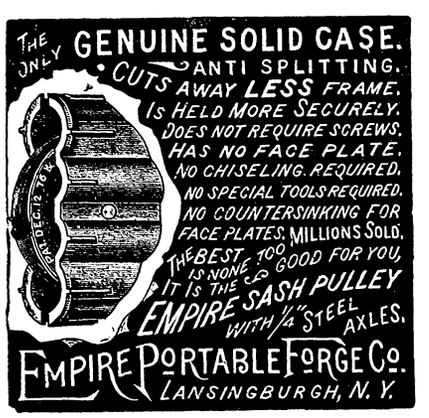


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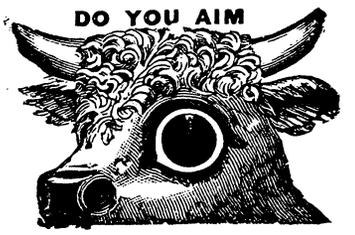


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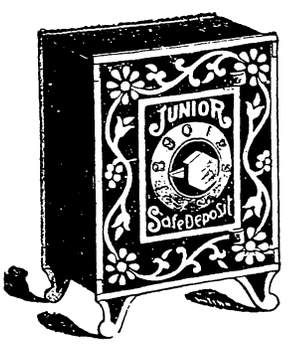


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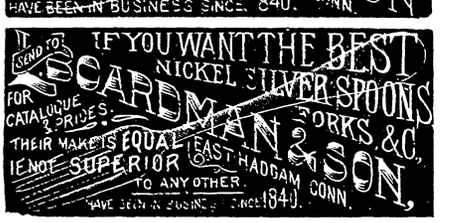


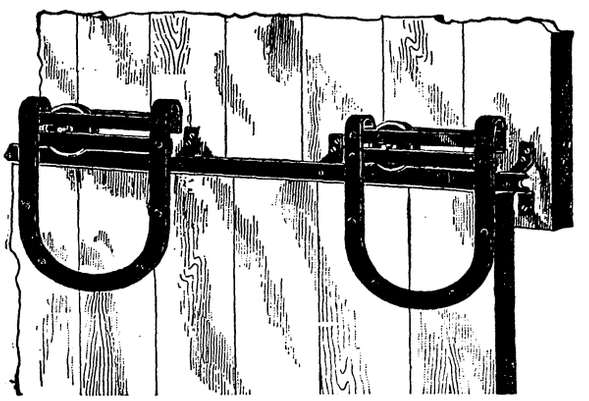

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The first Anti-friction Steel Door Hanger placed upon the market and to-day stands as the original and best. Sold in all the States of the Union, as well as abroad. Also Lane's Noiseless Steel Parlor Door Hanger, using Single Steel Track, a great success.

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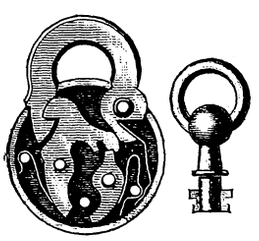

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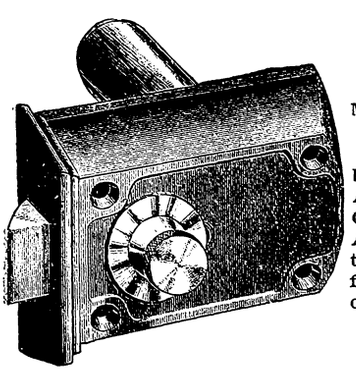

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Reversible. Adjustable. 3 Plated Steel Keys. No springs, except the bolt spring. **Awarded Best Prize** at World's Fair, Chicago. Undoubtedly the best latch extant. All are fully guaranteed. We employ no travelers and no agents. Ask your **Jobber** for our goods. Let us know if our **Cat. No. 11** is not on your file.


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HAVE YOU Our Price-List?

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ESTABLISHED 1879.

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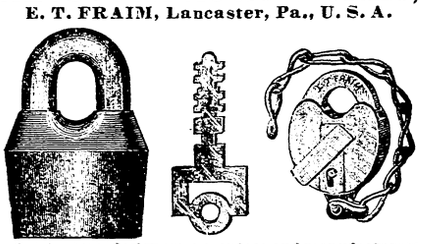
**E. T. FRAIM, Lancaster, Pa., U. S. A.**



Originators, designers, patentees and manufacturers of all the leading popular styles of **PADLOCKS**, Key-Locking Scandinavian with our patent Inter-Locking Tumblers; the only reliable lock of this style ever made. **SELF-LOCKING** Scandinavian of the highest type of perfection. Dust Proof Railroad, Freight Car and Switch Padlocks. Brass, Bronze, Steel and Malleable Iron Padlocks for all purposes and in all finishes. 181 different kinds. Write for our new 100-page catalogue.

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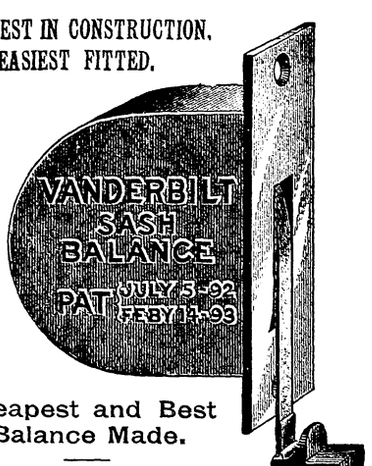


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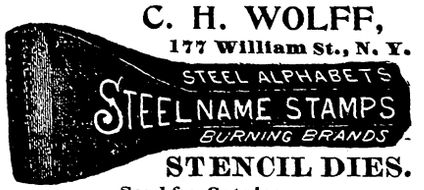


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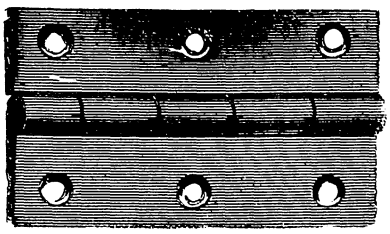

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**BRASS, GALVANIZED & SHIP CHANDLERY HARDWARE.**

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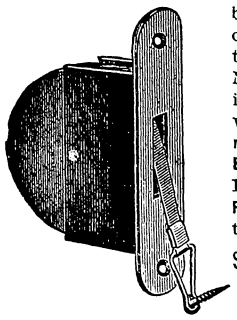
# A Well Balanced Sash

IS LIKE

**A Well Balanced Business Man,**

gives satisfaction to those who are brought in contact with them. Don't be inveigled into buying anything called Sash Balances that have no record. Made from light cast iron. Ask your Hardware dealer for **Pullman Steel Frame Sash Balance.** Warranted 15 years. Only **Steel Frame** Sash Balance in the world.



SIMPLE, CHEAP AND DURABLE

**PULLMAN SASH BALANCE CO., Rochester, N. Y.**

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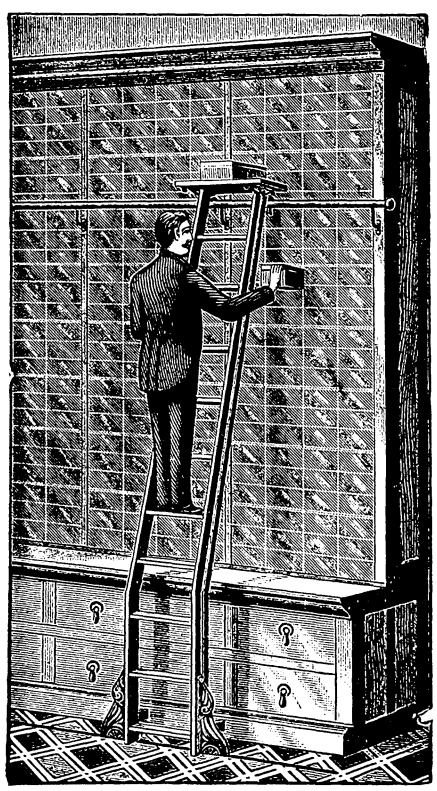

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No other Ladder Service can approach the "Bicycle" in ease and convenience of operation. Compared with others they work like a bicycle beside a lumber wagon.
Can be applied to any kind of shelving made.
See this space next week for other styles.
Send for Illustrated Catalogue and prices to

**THE BICYCLE STEP LADDER CO.,**
**50 State street, Chicago, Ill.**

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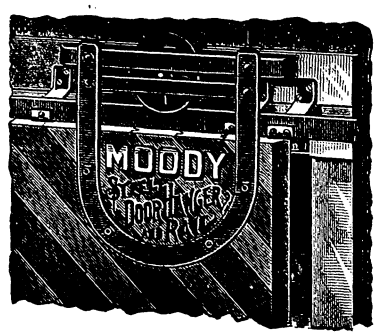


Showing one-half set of hangers attached to door.

## STEEL RAIL.

The Only Bracing Bracket Made.

**PRICE-LIST.**

| HANGERS. | Per Doz. prs. |
|---|---|
| No. 5, to run 6 feet, 3½ in. wheel, | $10.00 |
| No. 6, to run 10 feet, 4½ in. wheel, | 15.00 |
| No. 7, to run 15 feet, 5½ in. wheel, | 22.00 |
| RAIL, per foot | 6½ cents |

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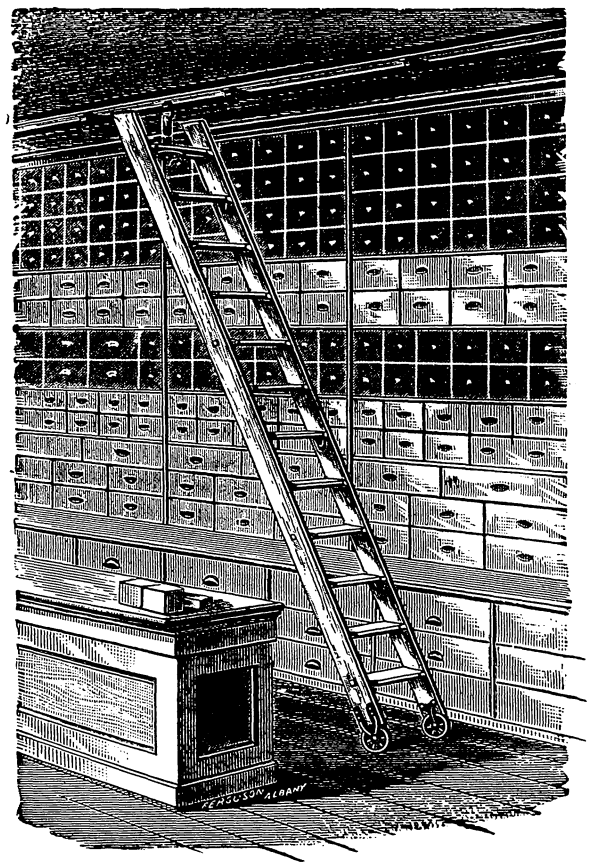
# THE "NOISELESS" STORE LADDER.



The latest and best. Perfectly noiseless. Neat in appearance.

Manufactured by

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## HARDWARE DEALERS

CAN RECOMMEND THE

## CHAMPION METAL WINDOW SASH CHAINS

to their customers as a reliable substitute for Sash Cords, very strong and lasting (some in daily use ten years), and gives thorough satisfaction wherever used. The patented attachments are very simple and can be applied to any window.

MANUFACTURED ONLY BY

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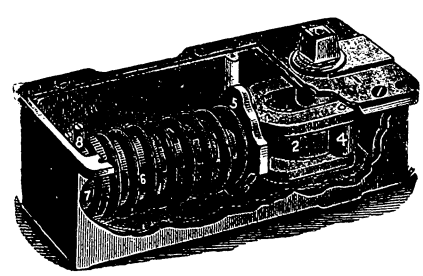


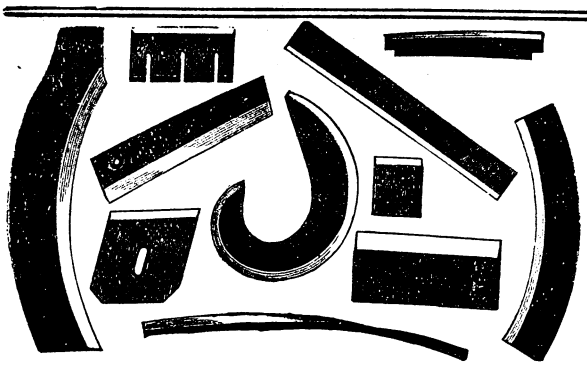
## CHECKING SPRING HINGES

**FOR SWING DOORS.**

Applied in floor under door. They close the door gently, without noise or violence and stop it at once at the centre. Doors cannot sag, springs do not break or set.

**I. BARDSLEY, 149 & 151 Baxter St., New York.**

Illustrated Price-List on Application.



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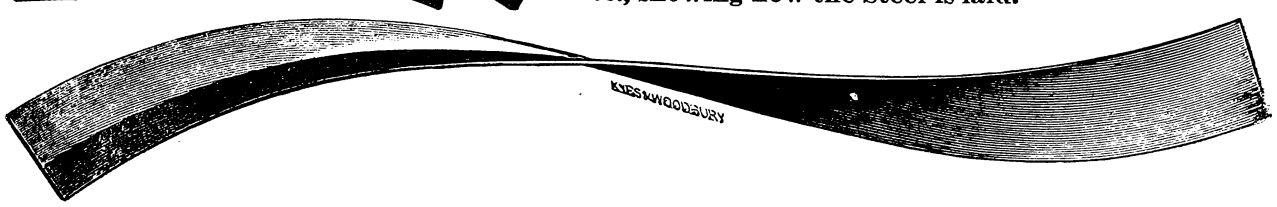


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PATENTED.

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**CHICAGO, ILL., U. S. A.**

Awarded Prize Medal at Paris Exposition and Jamaica Exposition

HERCULES. Combination Pipe, Bolt and Nut Wrench. Bright Finish

HERCULES. Bright Finish.

The Hercules Screw Driver and Tack Claw (Patented).

This Screw Driver is made from one piece of special cast steel, in all sizes, from 1½ in. to 12 in. The blade is well polished, carefully tempered, and every screw driver is subjected to a severe test and warranted. Handles Japanned with the best quality baking Japan.

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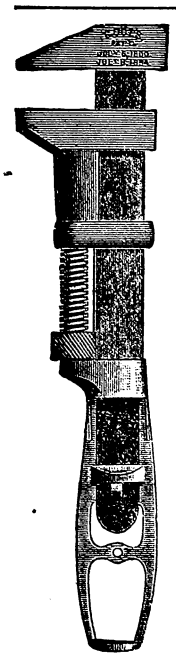


# L. COES'

Genuine Improved

KNIFE HANDLE

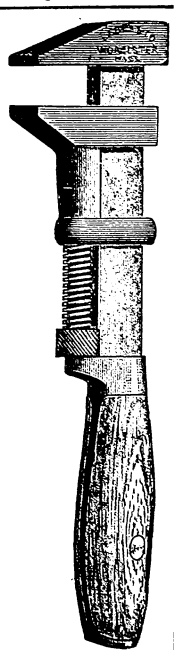
PATENT

# Screw Wrenches

MANUFACTURED BY

## COES WRENCH CO.,

WORCESTER, MASS.



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| Registered March 31, 1874. | Patented July 8, 1884. |

Sectional View Illustrates our New Knife Handle, showing Malleable Iron Frame and Shank of Bar keyed into position.

☞ **Straight Bar, Extra Long Nut for Screw in Jaw.** ☜

**The BEST MADE and STRONGEST WRENCH in the MARKET**

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## IMPROVED MINE LAMP

FOR ANTHRACITE AND BITUMINOUS MINING.

6 DIFFERENT STYLES OF SPOUTS.

SAMPLE 15¢.

SEAMLESS BRASS COLLAR

BRASS HINGE Lid Solid

No SOLDERING

B. E. LEONARD, Scranton, Pa.

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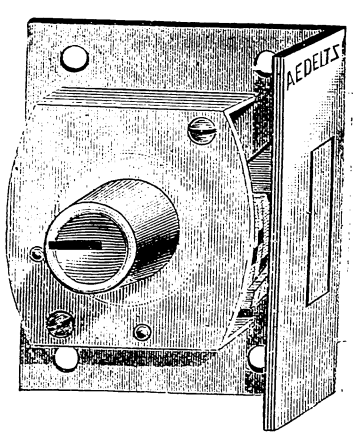


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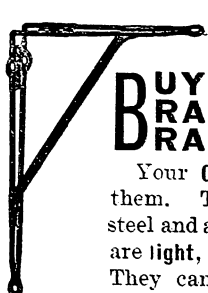

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**See Alphabetical Index, Pages 95 & 96.**

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Lovell Mfg. Co., Ltd., Erie, Pa.
Zucker & Levett Chemical Co., 10 to 14 Grand St., N. Y.

**Edge Tools.** *Makers of.*
Buck Bros., Millbury, Mass.
Buffalo Edge Tool Wks., Buffalo, N.Y.
Plumb, Fayette R., Philadelphia, Pa
White, L. & I. J. Co., Buffalo, N. Y.

**Egg Beaters.**
North Bros. Mfg. Co., Philadelphia.

**Electric Bells and Supplies.**
Ostrander, W. R. & Co., 204 Fulton St., New York
Wollensak, J. F., Chicago, Ill.

**Electric Dynamo Machines.**
Colburn Electric Mfg. Co., Fitchburg, Mass.

**Elevators.** *Makers of.*
Link-Belt Engineering Co., Phila., Pa
Morse, Williams & Co., Phila., Pa.
Salem F'dry & Mch. Co., Salem, Mass.

**Emery and Emery Wheels.**
Bell, Geo. E , 36 John St. N. Y.
Grant Corundum Wheel Mfg. Co. Worcester, Mass.
N. Y. Belting & Packing Co., Ltd., N. Y
Northampton Emery Wheel Co Leeds, Mass.
Norton Emery Wheel Co., Worcester Mass.
Sterling Emery Wheel Co., 174 Fulton St., New York.

**Enamels.**
Nubian Iron Enamel Co., Cragin, Ill

**Engineers and Contractors.**
Aiken Henry, Pittsburgh, Pa.
Artificial Gas Engineering Co., Pittsburgh, Pa.
Herrick, J. A., 284 Pearl St., N. Y,
Kennedy, Julian, Pittsburgh, Pa.
Laughlin, Alex. & Co., Pittsburgh, Pa
Lean, D. R., Co., Pittsburgh, Pa.
McClure, Amsler & Co., Pittsburgh, Pa
Pittsburgh Iron & Steel Engineering Co., Pittsburgh, Pa.
Roberts, Frank C., Philadelphia, Pa.
Smythe, S. R. Co., Incorporated Pittsburgh, Pa.
Swindell, W. & Bros., Pittsburgh, Pa
Witherow, Jas. P. Co., Pittsburgh; Pa.

**Engines, Gas.**
Otto Gas Engine Works, Phila., Pa.
Rollason Gas Engine, Havemayer Bldg. N. Y.

**Engines, Steam.** *Makers of.*
Bass Foundry & Machine Works, Ft. Wayne, Ind.
Buckeye Engine Co., Salem, O.
Erie Engine Works, Erie, Pa.
Norwalk Iron Works Co., So. Norwalk, Conn.
Penna. Diamond Drill & Mfg. Co., Birdsboro, Pa.
Phila. Engineering Works, Phila., Pa.
Phoenix Iron Wks. Co. Meadville, Pa.
Shipman Engine Co., Boston, Mass.
Southwark Foundry and Machine Co. Phila., Pa.
Tod, William & Co., Youngstown, O.
Wetherill, Robt. & Co., Chester, Pa.

**Exhaust Tumblers.**
Sweester, W. A., Brockton, Mass.

**Expansion Bolts.**
Boone, W. C. Mfg. Co., Boonton, N. J.
Church, Isaac, Toledo, O

**Faucets, Self-Measuring.**
Lane Bros., Poughkeepsie, N. Y

**Faucets, Wooden.** *Makers of.*
Boston & Lockport Block Co., Boston Mass., and Lockport, N. Y.
John Sommer's Son. Newark, N. J.

**Feed-Water Heaters.**
Davis, I. B. & Son, Hartford, Conn.
Goubert Mfg. Co., 32 Cortlandt St., N.Y
Harrison Safety Boiler Wks. Phila, Pa.
National Pipe Bending Co., New Haven, Conn.
Webster, Warren & Co., Camden, N. J.
Whitlock Coil Pipe Co., Elmwood, Conn.

**Fencing, Iron and Wire.**
Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Clinton Wire Cloth Co., Clinton, Mass.
Gilbert & Bennett Mfg. Co., 42 Cliff St.,
Kilmer Mfg. Co., Newburgh, N. Y.
Mast, Foos & Co., Springfield, O.
The Van Dorn Iron Works Co., Cleveland, O.
Reliance Wire & Iron Wks., Milwaukee

**Files.** *Importers of*
Moss, F. W., 80 John, N. Y.

**Files and Rasps,** *Manufacturers of*
Arcade File Works, Anderson, Ind
Banker & White, Troy, N. Y.
Barnett, G. & H., 41 & 43 Richmond Phila.
McCaffrey File Co., Philadelphia.
Nicholson File Co., Providence R. I.

**Fire Brick.** *Makers of.*
Borgner, Cyrus, Philadelphia, Pa.
Gardner, Jas. & Son, Cumberland, Md.
Kreischer B'k Sons, foot E. Houston, St
McLeod & Henry Co., Troy, N. Y.
Maurer, H. & Son, 420 E. 23d, N. Y.
Ostrander Fire Brick Co., Troy, N. Y.
Valentine, M. D. & Bro., Woodbridge.

**Fire Sets.**
Troy Nickel Works, Troy, N. Y.

**Fishing Tackle.**
Dame, Stoddard & Kendall, Boston, Mass.

**Flint and Emery Paper.**
Baeder, Adamson & Co., Phila., Pa.

**Flue Cleaners.**
Mackey, Jas. T., St. Louis, Mo.

**Fodder Cutters.**
Silver Mfg. Co., Salem, O.

**Foreign Periodicals.**
Stechert, G. E., 810 Broadway, N.Y.

**Forges, Portable, &c.**
Bullock Bellows Co., Cleveland, O.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Empire Portable Forge Co., Lansingburg, N. Y.
Sturtevant, B. F. Co., Boston, Mass.

**Forgings, Iron and Steel.**
Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Steel—Cambria Iron Co., Johnstown, Pa.
Frankford Steel Co., Phila. Pa.
Scranton Forging Co., Scranton, Pa.

**Foundry Facings.**
S. Obermayer Co., Cincinnati, O.
Smith, J. D. Fdy. Supply Co., Cinn., O.

**Foundry Riddles.**
Estey, W. S. 65 Fulton, N. Y.

**Foundry Supplies.**
Colliau, Victor, Detroit, Mich.
Diamond Clamp & Flask Co., Richmond, Ind.
S. Obermayer Co., Cincinnati, O.
Smith, J. D. Fdy. Supply Co., Cinn., O

**Friction Clutches.**
Keystone Clutch & Mch. Wks., Phila., Pa.
Moore & White Co., Philadelphia, Pa.

**Friction Cone.**
Evans Friction Cone Co., Boston, Mass

**Fruit Presses.**
Enterprise Mfg. Co. Philadelphia, Pa.

**Gas Producers.**
Wood, R. D. & Co. Philadelphia, Pa.

**Gas & Steam Fitters' Supplies.**
Pancoast, Henry B. & Co., Phila., Pa.

**Gauge, Rolling Mill.**
Haines Gauge Co., Philadelphia, Pa.

**Gear Cutters.**
D. E. Whiton Mach. Co., New London, Conn.

**Gears.**
Boston Gear Works Boston, Mass.
Gleason Tool Co., Rochester, N. Y.
Poole, Robt. & Son Co., Baltimore, Md.

**Glass Cutters.**
Monce, S. G., Bristol, Conn.

**Glass Tubes,**
Ashcroft Mfg. Co., 111 Liberty St., N.Y.

**Glue.**
Baeder, Adamson & Co., Phila., Pa.
Russia Cement Co., Gloucester, Mass.

**Grass Catchers.**
Supplee Hardware Co, Phila., Pa.

**Grinding and Polishing Machines.**
Norton Emery Wheel Co., Worcester, Mass.
Washburn Shops, Worcester, Mass.

**Grindstone Dressing Machinery**
Blake & Johnson, Waterbury, Conn.

**Grindstones.**
Cleveland Stone Co., Cleveland, O.

**Gunpowder,** *Makers of.*
Laflin & Rand Powder Co., 29 Murray St., N. Y.

**Hand Carts.**
Lansing Wheelbarrow Co., Lansing, Mich.

**Handles.**
New York Mallet and Handle Wks. 456 E. Houston St., N. Y.

**Hangers, Door.**
Coburn Trolley Track Mfg. Co., Holyoke, Mass
Lane Bros., Poughkeepsie, N. Y.
Victor Mfg. Co., Newburyport, Mass.

**Hardware Comm'n Merchants.**
Doscher, Martin, 88 Chambers, N. Y.
Field, Alfred & Co., 93 Chambers St., N. Y.
Graham, John H. & Co., 111 Chambers St., New York.
Jacobus, W. H., 90 Chambers, N. Y.

**Hardware Manufacturers.**
Hotchkiss, E. S. Bridgeport, Conn.
Stearns, E. C. & Co., Syracuse, N. Y.
Union Mfg. Co., 103 Chambers, N. Y.
Yale & Towne Mfg. Co., Stamford, Conn

**Hardware Mfrs. Agents.**
Bingham, W. Co., Cleveland, O.
Clarke Thomas, St. John, New Brunswick.
Graham, John H. & Co., 113 Chambers,
McCoy, Jos F. Co., 26 Warren St., N. Y
Sickles, Sweet & Lyon, 35 Barclay, N. Y,

**Hardware Specialties.**
Acme Shear Co., Bridgeport, Conn.
Belden Machine Co. New Haven. Conn.
Empire Portable Forge Co., Lansingburg, N. Y.
Enterprise Mfg. Co., Philadelphia, Pa.
Ette & Henger Mfg. Co., St. Louis, Mo.
Haines & Zimmerman, Phila Pa.
Hart, H. C Mfg. Co., Detroit, Mich.
Johnson, S. C., Racine, Wis.
Knapp & Cowles Mfg. Co., Bridgeport, Conn.
New Britain Hdw. Mfg. Co., New Britain, Conn.
North Bros. Mfg. Co., Philadelphia, Pa
Peabody & Parks, Troy, N. Y.
Shepard, Sidney & Co., Buffalo, N. Y.
Weiland, Chas., 149 Chambers St., N.Y
Wilson, J. Fred, Worcester, Mass.

**Hardware, Yacht and Ship.**
Ferdinand, L. W. & Co., Boston, Mass.

**Harness Snaps.**
Covert Mfg. Co., West Troy, N. Y.
Coverts' Saddlery Wks., Farmer, N.Y.
Fitch, W. & E. T., New Haven, Conn.

**Hay Knives.**
Holt, Hiram, Co., E. Wilton, Me.

**Hoisting Machines.**
Box, Alfred & Co., 314 Green, Phila.
Brown Hoisting & Conveying Mch. Co. Cleveland, Ohio.
Copeland & Bacon, 85 Liberty St. N.Y
Fulton Iron & Engine Wks., Detroit, Mich.
Harrington, E., Son & Co., Phila.
Lane Bros., Poughkeepsie, N. Y.
Lidgerwood Mfg. Co., 96 Liberty, N. Y.
Maris & Beekley, Philadelphia.
Moore Mfg. & Fdy. Co., Milwaukee, Wis
Morse, Williams & Co., Phila.
Sellers, Wm. & Co., Phila. and N. Y.
Speidel, J. G., Reading, Pa.
Yale & Towne Mfg. Co., Stamford, Ct.

**Hollow Ware.**
Bronson Supply Co., Cleveland, Ohio.
Cleveland Stamping & Tool Co., Cleveland, O.

**Hollow Ware, Aluminum.**
Illinois Pure Aluminum Co. Lemont, Ill

**Horse and Barbers' Clippers.**
Hotchkiss, E. S., Bridgeport, Conn.

**Horse Nails,** *Makers of.*
Capewell Horse Nail Co., Hartford, Conn.
National Horse Nail Co., Vergennes, Vt,
Putnam Nail Co., Neponset, Boston, Mass.

**Horse and Mule Shoes.** *Makers of.*
Bryden Horse Shoe Co., Catasauqua, Pa.
Burden Iron Co., Troy, N. Y.
Crescent Horse Shoe & Iron Co., Max Meadows, Va.
Diamond State Iron Co., Wilmington, Del.
Old Dominion Iron & Nail Works Co., Richmond, Va.
Phoenix Horse Shoe Co., Poughkeepsie N. Y.
Rhode Island Perkins Horse Shoe Co., Providence.
Shoenberger & Co., Pittsburgh, Pa.
Standard Horse Shoe Co., Boston, Mass.

**Hose.**
N. Y. Belting & Packing Co., Ltd., 15 Park Row, N. Y.

**Hydrants, &c.**
McLean, John, 296 & 298 Monroe, N.Y.

**Hydraulic Jacks.**
Dudgeon, Richard, 24 Columbia, N. Y.
Watson & Stillman, 204 E. 43d, N. Y.

**Ice-Cream Freezers.**
North Bros. Mfg. Co., Phila., Pa.
Packer, C. W., Philadelphia, Pa.
White Mountain Freezer Co., Nashua, N. H.

**Injectors.**
Eynon-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., New York.

**Insurance, Boiler.**
Hartford Steam Boiler Inspection & Insurance Co. Hartford Conn.

**Iron and Steel, Swedish.**
Lundberg, Gustaf, Boston, Mass.
Milne, A. & Co., 1 Broadway, N. Y

**Iron Commission Brokers.**
Corning, Edw. & Co., 29 B'way, N. Y.
Cotton, Bradley & Co., Philadelphia.
Etting, Edw. J., Philadelphia.
Hogan, John L. & Co., Philadelphia Pa.
Hoffman, J. W. & Co., Philadelphia.
Levis, Henry & Co., Philadelphia.
Keeley, Jerome & Co., Philadelphia.
Lea, J. Tatnall & Co., Philadelphia.
Mohr, J. J., 430 Walnut, Philadelphia.
Pilling & Crane, Philadelphia, Pa.
Sibell, Geo. H. & Co., Chicago, Ill.
Wister, L. & R. & Co., Phila., Pa.

**Iron Ore.**
Naylor & Co., 45 Wall, N. Y.
Pullman, J. Wesley, Phila. Pa.
Samuel, Frank, Philadelphia, Pa.

**Iron,** *Merchants.*
Barnes, C. K. & Co., Philadelphia, Pa
Borden & Lovell, 70 West, N. Y.
Bussenius & Cunliffe, Philadelphia.
Corning Edw. & Co., 29 B'way, N. Y.
Cox, Justice, Jr., Philadelphia
Cotton, Bradley & Co., Philadelphia
Hoffman, J. W. & Co., Philadelphia.
Leonard, J., 446 West St., N. Y.
Naylor & Co. 45 Wall St., N. Y.
Nicolls, Wheeler & Co., Philadelphia.
Ogden & Wallace, 85 Elm St. N. Y
Pierson & Co., 29 Broadway, N. Y.
Thomson, W. H. & Co., Phila., Pa.
Wallace, Wm. H. & Co., Albany & Washington streets, N. Y.
Whitney, A. R. & Co., 17 B'way, N. Y.
Wilson, E. H. & Co., Philadelphia.

**Iron,** *Importers.*
Abbott Wheelock & Co. N.Y. and Boston
Lundberg, Gustaf, Boston, Mass.

**Iron, Sheet.** *Manufacturers of.*
Cambridge Iron & Steel Co., Cambridge Ohio
W. Dewees Wood Co., Lim., McKeesport, Pa.

**Ironwork, Ornamental.**
Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Mast, Foos & Co., Springfield, O.
The Van Dorn Iron Works Co., Cleveland, O.

**Keys.**
Wollensak, J. F., Chicago, Ill.

**Ladders, Rolling.**
Coburn Trolley Track Mfg. Co., Holyoke, Mass.

**Ladles.**
Detroit Fdy. Equipment Co., Detroit, Mich.

**Lamp Stoves.**
Glazier Stove Co., Chelsea, Mich.

**Lamps.**
Standard Lighting Co., Cleveland, O.

**Lanterns.**
Ohio Lantern Co., Tiffin, Ohio.
Steam Gauge & Lantern Co., Syracuse, N. Y.

**Lathes.**
Draper Machine Tool Co., Worcester, Mass.
Johnson, Israel H., Jr., & Co., Philadelphia, Pa.
Seneca Falls Mfg. Co., Seneca Falls N. Y.

**Lathing, Wire.**
Clinton Wire Cloth Co., Clinton, Mass
N. J. Wire Cloth Co., Trenton, N. J.
Wright & Colton Wire Cloth Co., Worcester, Mass.

**Lawn Mowers.**
Chadborn & Coldwell Mfg. Co., Newburg, N. Y.
Coldwell Lawn Mower Co., Newburg, N. Y.
Dille & McGuire Mfg. Co., Richmond, Ind.
F. & N. Mfg. Co., Richmond, Ind.
Henley, M. C., Richmond, Ind.
Mast, Foos & Co., Springfield, O.
Stearns, E. C. & Co., Syracuse, N. Y.
Supplee Hdw. Co., Phila. Pa.

**Lawn Rakes.**
Gibbs Mfg. Co, Canton, Ohio.
Konler, F. E. & Co., Canton, O.
Schaeffer & Co., Dayton, Ohio.
Syracuse Specialty Mfg. Co., Syracuse N. Y.

**Lawn Sprinklers.**
Ette & Henger Mfg. Co., St. Louis,
Gibbs Mfg. Co., Canton, Ohio.
McGowan, John H. Co., Cincinnati, O.

**Lemon Squeezers.**
Ripley Mfg. Co., Unionville, Conn.

**Letters and Figures, Metallic**
White, A. A. & Co., Providence, R. I.

**Letters, Paper.**
Tablet & Ticket Co., Chicago, Ill.

**Levels.**
Davis & Cook, Watertown, N. Y.
Richardson, C. F., & Son Athol, Mass.

**Locks & Knobs,** *Manufacturers of*
Deitz, A. E., 97 Chambers, N. Y
Keyless Lock Co., Chicago, Ill.
Reading Hdw. Co., Reading, Pa.
Smith & Egge Mfg Co. Bridgeport, Conn
Yale & Towne Mfg. Co., Stamford, Conn

**See Alphabetical Index, Pages 95 & 96.**

**Machinery.**
Am. Tool Works, Cleveland, Ohio.
Barnes, W. F. & John, Rockford, Ill.
Sement, Miles & Co., Philadelphia, Pa.
Bigelow, C. E., 45 Dey, N.Y.
Bignall & Keeler Mfg. Co., St. Louis.
Birmingham Iron Foundry, Birmingham, Conn.
Bliss, E. W. Co., Brooklyn, N. Y.
Bogert, Jno. L., Flushing, N. Y.
Briggs, Marvin, 12 Broadway, N. Y.
Carlin's Sons, Thos., Allegheny, Pa.
Cinn. Milling Mch. Co., Cincinnati, Ohio.
Clapp, Geo. M., agt., 74 Cortlandt, N.Y
Coulter & McKenzie Mch. Co., Bridgeport, Conn.
Detrick & Harvey Mch. Co., Baltimore, Md.
Fitchburg Mch. Works, Fitchburg, Mass.
Garvin Mch. Co., Laight & Canal Sts
Gould & Eberhardt, Newark, N. J.
Hamilton Mch. Tool Co., Hamilton, O.
Harrington, E. Son & Co., Phila. Pa.
Henderer, A. L., Wilmington, Del.
Hendey Machine Co., Torrington, Ct.
Hill, Clarke & Co., Boston, Mass.
Johnson, Israel H., Jr., & Co., Phila.
Jones & Lamson Mch. Co., Springfield Vt
Lovegrove & Co., Philadelphia, Pa.
McCabe, J. J., 68 Cortlandt, N. Y.
Machinists Supply Co. Rochester, N.Y
Manville, E. J. Mch. Co, Waterbury, Conn
Newark Mch. Tool Works, Newark, N.J
New Haven Mfg. Co., New Haven, Conn
New York Mach'y Depot, N. Y.
Niles Tool Wks., 138 Liberty St., N. Y.
Pittsburgh Mfg. Co., Pittsburgh, Pa.
Place, Geo., 120 Broadway, N. Y
Poole, Robt. & Son Co., Baltimore, Md
Powell Planer Co., Worcester, Mass.
Pratt & Whitney Co., Hartford, Conn
Prentiss Tool & Supply Co., N. Y
Scranton Supply & Mchry. Co., Scranton, Pa.
Sellers, Wm. & Co., Phila.
Seyfert's Sons L. F., Philadelphia, Pa
Steptoe, J. & Co., Cincinnati, O.
Stow Flexible Shaft Co., Ld., Phila.
Toomey, Frank, Philadelphia, Pa.
Wetherill, Robert & Co., Chester, Pa.
Wilson, W. A., Rochester, N. Y.

**Machinery for Hardware Manufacture.**
Adt, Jno. & Son, New Haven, Conn.

**Machine Knives.**
Loring Coes & Co., Worcester, Mass

**Machine Screws.**
New Britain Hdw. Mfg. Co., New Britain, Conn.

**Machine Tools.**—*See Machinery.*

**Machine Work.**
Papping, J., 58th St., & 11th Ave., N.Y. City.

**Machinists' Scales.**
Coffin & Leighton, Syracuse, N. Y
Starrett, L. S., Athol, Mass
Vallentine Tool Co., Hartford, Conn.

**Machinists' Tools and Supplies.**
King, J. M. & Co., Waterford, N. Y.
Sellers, Wm. & Co., Inc., Phila.

**Mallets.**
N. Y. Mallet & Handle Works, N. Y

**Manufacturing Sites.**
Chicago, Milwaukee & St. Paul R. R., Chicago, Ill.

**Measuring Tapes.**
Keuffel & Esser Co., 127 Fulton St., N.Y.
Lufkin Rule Co., Saginaw, Mich.

**Meat Cutters and Stuffers.**
Enterprise Mfg. Co., Philadelphia, Pa.

**Mechanical Instruction.**
Correspondence School of Mechanics Scranton, Pa.

**Metals.**
Fearing, Wm. S., 100 Chambers, N. Y
Hendricks Bros., 49 Cliff, N. Y.
Naylor & Co., 45 Wall, N. Y.

**Metal Brokers.**
American Metal Co., N. Y.

**Metallurgists.**
Britton J. Blodgett, Phila.

**Milling Machines.**
Cin. Milling Mch. Co., Cincinnati, Ohio.

**Mincing Knives.**
Palmer Hdw. Mfg. Co., Troy, N. Y.

**Mine Lamps.**
Darby, Edw. & Sons Phila. Pa.
Leonard, B. E., Scranton, Pa.

**Mining Screens.**
Harrington & King Perforating Co Chicago, Ill.
Howard & Morse, 45 Fulton, N. Y

**Mirrors.**
Rice, C. F., Chicago, Ill.

**Models,** *Makers of*
Franklin, H. H. Mfg. Co., Syracuse, N. Y.

**Molding Sand.**
Obermayer, S. Co., Cincinnati, O.

**Motors, Water and Electric.**
C. & C. Electric Co., 402 and 404 Greenwich St., N. Y.
Dallett, Thos. H. & Co., Phila., Pa.

**Nail Machinery.**
Pittsburgh Mfg. Co., Pittsburgh, Pa.

**Nails (Cut) and Spikes.**
Borden & Lovell, 70 West, N. Y.
Cumberland Nail & Iron Co., Phila.
Oxford Iron Co., 81 Washington, Pottstown Iron Co., Pottstown, Pa.
Riverside Iron Wks, Wheeling, W. Va.

**Neck Yokes.**
Johnson, S. C., Racine, Wis.

**Nickel Platers' Supplies.**
Colburn Electric Mfg. Co., Fitchburg, Mass.
Zucker & Levett Chemical Company. 10 to 14 Grand St., N. Y

**Norway Shapes,** *Rollers of.*
Rowland, William & Harvey, Frankford, Philadelphia

**Novelty Manufacturers.**
Franklin, H. H. Mfg, Syracuse, N. Y.

**Nut Machines.**
Dunham Nut Mch. Co., Unionville, Ct

**Nuts, Bolts, &c.,** *Makers of.*
American Bolt Co., Lowell, Mass.
American Screw Co., Providence, R. I.
Blake & Johnson, Waterbury, Conn.
Haskell, Wm. H. Co., Pawtucket, R. I
Mt. Carmel Bolt Co., Mt. Carmel, Conn.
Port Chester Bolt and Nut Co., Chester, N. Y.
Russell, Burdsall & Ward, Port Chester
Sternbergh, J. H. & Son, Reading, Pa
Wilson, J. Fred., Worcester, Mass.
Wm. H. Haskell Co., Pawtucket, R. I.

**Oilers.**
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

**Oil Stones.**
Pike Mfg. Co., Pike Station, N. H.

**Oil Stoves.**
Glazier Stove Co., Chelsea, Mich.

**Ores.**
Wister, Francis, Philadelphia, Pa.

**Ox Shoes.**
Scranton Forging Co., Scranton, Pa.

**Packing.**
Morrison, Robt., St. Louis, Mo.
N. Y. Belting & Packing Co. Ltd., N.Y.

**Padlocks.**
Ames Sword Co., Chicopee, Mass.
Fraim, E. T., Lancaster, Pa.
Hillebrand & Wolf, Phila., Pa.
Miller Lock Co., Philadelphia, Pa.

**Paint.**
Dixon, Jos. Crucible Co., Jersey City, N.J

**Paint Burners.**
Dangler Stove & Mfg. Co., Cleveland, O

**Paint Cans.**
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

**Patent Solicitors.**
Howson & Howson, Phila. & Wash'gton.
Jenner, H. W. T., Washington, D. C.
Stocking, E. B., Washington, D. C.

**Perforated Metal.**
Clinton Wire Cloth Co., Clinton, Mass.
Harrington & King Perforating Co. Chicago, Ill
Hendrick Mfg. Co., Ltd., Carbondale, Pa.

**Phosphor Bronze.**
Phosphor Bronze Smelting Co., Limited, 512 Arch, Philadelphia.

**Phosphor Tin.**
Crescent Phosphorized Metal Co., Philadelphia, Pa.
Crosby Steam Gage & Valve Co., Boston, Mass.
Halk & Naumann, 516 Pearl, N. Y.

**Picks and Mattocks.**
Plumb, Fayette R., Philadelphia, Pa.

**Pig Iron.**
Houston, C. B. & Co., Philadelphia, Pa
Montour Iron & Steel Co., Danville, Pa.
Naylor & Co., 45 Wall, N. Y.
Pilling & Crane, Philadelphia, Pa.
Samuel, Frank, Philadelphia, Pa.

**Pig Iron Storage.**
Am. Pig Iron Storage Warrant Co., 44 Wall, N. Y.

**Pile Drivers.**
Vulcan Iron Wks., Chicago, Ill.

**Pipe, Bent.**
National Pipe Bending Co., New Haven

**Pipe Cutting and Threading Machines.**
Bignall & Keeler Mfg. Co. St. Louis, Mo.
Merrill Mfg. Co., Toledo, O.
Pancoast Henry B. & Co., Philadelphia.
Saunder's Sons, D., Yonkers, N. Y.

**Pipe Grips.**
Prentiss Vise Co., 44 Barclay, N. Y,

**Pipes, Fittings, &c.,** *Makers of.*
McNab & Harlin Mfg. Co., N. Y.

**Pipe, Water and Gas,** *Makers of.*
Cumberland Nail & Iron Co., Phila, Pa
Donaldson Iron Co., Emaus, Pa.
Riverside Iron Works, Wheeling, W Va.
Wood, R. D. & Co., Philadelphia, Pa.

**Plane Irons,** *Manufacturers of.*
Buck Bros., Millbury, Mass.

**Planes,** *Manufacturers of.*
Stanley Rule & Level Co., N. Y

**Plated Ware.**
Boardman, L. & Son, New Haddam, Ct
Holmes & Edwards Silver Co., Bridgeport, Conn.
Rogers, Wm. Mfg. Co., Hartford, Ct.
Rogers & Hamilton, Waterbury, Ct.
Upson & Hart Co., Unionville, Ct.

**Plate, Iron and Steel,** *Mfrs of*
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Lukens Iron & Steel Co., Coatesville, Pa.
Mahoning Valley Iron Co., Youngstown, Ohio.
Moorhead-McLean Co., Pittsburgh, Pa.
McIlvain & Sons, Reading, Pa.
Pottstown Iron Co., Pottstown, Pa.
Pottsville Iron & Steel Co., Pottsville, Pa.
Singer, Nimick & Co., Pittsburgh, Pa.
The Mahoning Valley Iron Co., Youngstown, O.
Wellman Iron & Steel Co., Thurlow, Pa
Wood Alan Co., Philadelphia.

**Plating, Nickel, Brass and Silver.**
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

**Pokers and Lifters.**
Troy Nickel Works, Troy, N. Y.

**Polishing Machines.**
Watson & Stillman, 204 E. 43d, N. Y.

**Polishing Wheel.**
La Massena, C. E. & Co., Newark, N.J.

**Post Hole Diggers.**
Gibbs Mfg. Co., Canton, Ohio.
Wister, L. & R. & Co., Philadelphia, Pa.

**Poultry Nettings.**
Barnum, E. T., Detroit, Mich.
Gilbert & Bennett Mfg. Co., 42 Cliff St. N. Y
N. J. Wire Cloth Co., Trenton, N. J.
"Silver Finish."
Tyler Wire Wks. Co., W. S., Cleveland, O.
Wright & Colton Wire Cloth Co., Worcester, Mass.

**Powder.**
Laflin & Rand Powder Co., 29 Murray
New York Powder Co., 62 Liberty St., N. Y.

**Power Hack Saws.**
Millers Falls Co., 93 Reade St., N. Y.

**Power Hammers.**
Belden Mach. Co., New Haven, Conn.
Dienelt & Eisenhardt, Philadelphia.
Jenkins & Lingle, Bellefonte, Pa.
Long & Allstatter Co., Hamilton, Ohio.

**Presses, Dies, &c.**
E. W. Bliss Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Niagara Stamping and Tool Co., Buffalo, N. Y.
Stark Mch & Tool Co., Buffalo, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.
Waterbury Mch. Co., Waterbury, Conn

**Presses, Power,** *Makers of.*
Bliss, E. W. Co., Brooklyn, N. Y.
Manville, E. J. Mch. Co., Waterbury, Ct,
Merriman, A. H., Meriden
Niagara Stamping and Tool Co. Buffalo, N. Y.
Stark Mch. & Tool Co., Buffalo, N. Y.
Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.

**Pulleys.**
Keystone Clutch Mch. Wks., Phila., Pa.
Lane, J. H. & D. Co., Massillon, Ohio,

**Pulverizing Mill.**
Bradley Fertilizer Co., Boston, Mass.

**Pumping Machinery.**
Coulter & McKenzie Mch. Co., Bridgeport, Conn.
Dean Bros. Steam Pump Works, Indianapolis, Ind.
Hooker-Colville Steam Pump Co., Chicago, Ill.
Mcgowan, J. H. & Co., Cincinnati, O.
Maslin, J. & Son, Jersey City, N. J.
Norwalk Iron Wks. Co., So. Norwalk, Conn.
Southwark Fdy. & Mch. Co., Phila., Pa
Valley Pump Wks, Easthampton, Mass
Worthington, Henry R., 86 & 88 Liberty St., N. Y.

**Pumps,** *Makers of.*
Bellevue Pump Co., Bellevue, Iowa.
Deming Co., Salem, O.
Douglas, W. & B., Middletown, Conn.
Mast, Foos & Co., Springfield, O.
Myers, F. E. & Bro., Ashland, O.

**Punches and Shears, Hand and Power.**
E. W. Bliss Co., Brooklyn, N. Y.
Cockburn Barrow & Mch. Co., Jersey City, N. J.
Crosby, G. A. & Co., Chicago, Ill.
Henderer, A. L., Wilmington, Del.
Long & Allstater Co., Hamilton, Ohio.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Stark Mch. & Tool Co., Buffalo, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.
Waterbury Farrel Foundry and Mch. Co., Waterbury, Conn.
Watson & Stillman, 204 E. 43d, N. Y.

**Rails, Old and New.**
Perry, W. H. & Co., Providence, R. I.

**Rat and Mouse Traps.**
Burditt & Williams, Boston, Mass.
Estey, W. S. 65 Fulton, N. Y.
Ripley Mfg. Co., Unionville, Conn.

**Razors.**
Electric Cutlery Co., 113 Chambers, N.Y
J. R. Torrey Razor Co., Worcester, Mass

**Reels.**
Hendryx, A. B. Co., New Haven, Conn

**Refrigerator Door Fasteners.**
Conroy, P. J. & Co., Philadelphia.

**Rivets.**
Blake & Johnson, Waterbury, Conn.
Boyce Rivet Co., Muncie, Ind.
Burden Iron Co., Troy, N. Y.
Cobb & Drew, Plymouth, Mass.
Henderson, Jas. S., 165 Greenwich, N.Y.
Sternbergh, J. H. & Son, Reading, Pa.
Townsend, W. P. & Co., New Brighton Pa.

**Riveting Machines.**
Adt, Jno. & Sons, New Haven, Conn.

**Rock Drills.**
Sand Drill Co., 23 Park Place, N. Y.

**Rolling Mill Machinery**
Birmingham Iron F'dry, Birmingham, Conn.
Booth, The Lloyd, Co., Youngstown, O.
Leechburg Foundry & Mch. Co., Pittsburgh, Pa.
Mahoning F'dry & Mch. Co., Danville, Pa.
Morgan Construction Co., Worcester, Mass.
Robinson-Rea Mfg. Co., Pittsburgh.
Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.
Trethewey Mfg. Co., Pittsburgh, Pa.
Waterbury Farrel Foundry & Mch. Co., Waterbury, Conn.

**Roll Lathes.**
Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.

**Rolls, Chilled, Sand and Steel.**
Booth, The Lloyd, Co., Youngstown, O.
Garrison, A. Fdry. Co., Pittsburgh, Pa.
Seaman, Sleeth & Black, Pittsburgh.
Totten & Hogg Iron and Steel Fdry Co., Pittsburgh Pa.

**Roofing.**
Berlin Iron Bridge Co., E. Berlin, Conn
Boston Bridge Works, Boston, Mass.
Cambridge Roofing Co., Cambridge, O.
Johns, H. W Mfg. Co., 87 Maiden Lane

**Rope and Web Goods.**
Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Wks., Farmer, N. Y

**Rope Wheels.**
Cresson, Geo. V. Co., Philadelphia, Pa.

**Rubber Goods.**
Canfield, H. O., Bridgeport, Conn.

**Rules,** *Manufacturers of.*
Keuffel & Esser Co., 127 Fulton St., N.Y
Lufkin Rule Co., Saginaw, Mich.
Standard Tool Co., Athol, Mass.
Stanley Rule & Level Co., 29 Chambers,

**Sad Irons.**
Enterprise Mfg. Co., Philadelphia, Pa.

**Sand Paper.**
Baeder, Adamson & Co., Phila., Pa.

**Sash Balances.**
Pullman Sash Balance Co., Rochester, N. Y.
Vanderbilt Sash Balance Co., Canandaigua, N. Y.

**Sash Cords and Chains.**
Morton, Thos., 65 Elizabeth, N. Y.
Ossawan Mills Co., Norwich, Conn.
Samson Cordage Works, Boston, Mass.
Smith & Egge, Mfg. Co., Bridgeport.
Cincinnati Corrugating Co., Piqua, O.

**Sash Locks.**
Ives, H. B. & Co., New Haven, Conn.

**Sash Pulleys.**
Empire Portable Forge Co., Lansingburgh, N. Y.
Palmer Hardware Mfg. Co., Troy, N. Y

**Sash Weights.**
Brown, E. E. & Co., Philadelphia, Pa.

**Saw Filing Machines.**
Disston, Henry & Sons, Philadelphia, Pa.

**Saws,** *Makers of.*
Disston, Henry & Sons, Phila., Pa.
Hiss, C. A. & Co., 336-338 Carroll Ave Chicago, Ill.
National Saw Co., 96 Reade St., N. Y.
Simonds Mfg. Co., Fitchburg, Mass.

**Saw Sets.**
Taintor Mfg. Co., 84-86 Chambers, N

**Scales,** *Manufacturers of.*
Buffalo Scale Co., Buffalo, N. Y.
Chatillon, John & Sons, 85-89 Cliff, N.Y

**Scrapers, Road.**
Am. Steel Scraper Co., Sidney, Ohio.
Kilbourne & Jacobs Mfg. Co., Columbus, O.
Sidney Steel Scraper Co., Sidney, O.

**Screens, Coal and Ore.**
Hendrick Mfg. Co., Ltd., Carbondale, Pa.

**Screens, Door and Window.**
Queen Anne Screen Co., Burlington, Vt.

**Screw Cutting Machinery.**
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

**Screw Drivers.**
Brown, R. H. & Co., New Haven, Conn.
Capitol Mfg. Co., Chicago, Ill.
Mayhew, H. H. Co., Shelburne Falls, Mass.

**Screw Plate and Pipe Cutter.**
Jarecki Mfg. Co., Erie, Pa.

**Screws,** *Makers of.*
American Screw Co., Providence, R. I.
Blake & Johnson, Waterbury, Conn.
Wm. H. Haskell Co., Pawtucket.
Miles, F. S., 205 Quarry, Philadelphia.
National Screw & Tack Co., Cleveland, Ohio.
Reynolds & Co., New Haven, Conn.
Worcester Machine Screw Co., Worcester, Mass.

**Scroll Saws.**
Barnes, W. F. & John, Rockford, Ill.
Seneca Falls Mfg. Co., Seneca Falls N. Y

**Scythe Stones and Whetstones.**
Pike Mfg. Co., Pike Stat'n, N. H.
Cleveland Stone Co., Cleveland, O.

**Shafting,** *Makers of.*
Cresson, Geo. V., Co., Philadelphia, Pa.
Fairmount Mch. Co., Philadelphia, Pa.
Fitzsimons & Co., Cleveland, Ohio.
Sellers, Wm. & Co., Inc. Phila. Pa.
Stow. Co. Mfg, Binghamton, N. Y.

**Shaped Iron and Steel,**—*Manufacturers of.*
Ætna-Standard Iron & Steel Co., Bridgeport, O.

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Allentown Rolling Mill, Allentown, Pa
Lockhart Iron & Steel Co., Pittsburg, Pa.
Passaic Rolling Mill Co., Paterson, N.J.
Pottsville Iron & Steel Co., Pottsville Pa.
Roberts, A. & P. & Co., Phila., Pa.
The Phœnix Iron Co., Phila., Pa.
Tudor Iron Works, St. Louis, Mo.

**Shears and Scissors.**
Acme Shear Co., Bridgeport, Conn
Heinischs, R. Sons Co., Newark, N. J.

**Sheet Iron and Steel,** *Manufacturers of.*
Ætna-Standard Iron and Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, Ohio.
Chess Bros., Pittsburgh, Pa.
Mahoning Valley Iron Co., Livingston, Ohio.
Moorehead-McCleane Co., Pittsburgh,
Pierson & Co., 29 Broadway, N. Y.
Singer, Nimick & Co., Ld., Pittsburgh, Pa.
The Mahoning Valley Iron Co., Youngstown, O.
Alan Wood Co., Philadelphia.
W. Dewees Wood Co., McKeesport, Pa.

**Sheet Metal Work.**
Clark & Cowles, Plainville, Conn.

**Sheet Zinc.**
Matthiessen & Hegeler Zinc Co., La Salle, Ill.

**Shelf Brackets.**
Koch. A. B. & Co., Peoria, Ill.

**Sinks.**
Douglas, W. & B., Middletown, Conn.

**Skates. Ice.**
Barney & Berry, Springfield, Mass.
Dame, Stoddard & Kendall, Boston, Mass.
Lovell, Jno. P. Arms Co., Boston, Mass.
Sickels, Sweet & Lyon, 35 Barclay St., N. Y.
Winslow, Sar'l, Skate Mfg. Co. Worcester, Mass.

**Skates. Roller.**
Barney & Berry, Springfield, Mass.
Henley, M. C., Richmond, Ind.
Winslow, Saml., Skate Mfg. Co., Worcester, Mass

**Smelting Works.**
Reeves, Paul S., 760 S. Broad, Phila.

**Soldering Coppers.**
Clendenin Bros., Baltimore, Md.

**Speaking Tubes.**
Ostrander, W. R. & Co., 204 Fulton St., N. Y.
Wollensak, J. F., Chicago, Ill.

**Specialties, Pat. Articles.**
Konigslow, O., Cleveland, O.

**Spelter.**
Matthiessen & Hegeler Zinc Co., La Salle, Ill.

**Spoons and Forks.**
Boardman, L. & Son, New Haddam, Conn.
Holmes & Edwards Silver Co., Bridgeport, Conn.
Rogers, The Wm. Mfg. Co., Hartford, Conn.
Rogers & Hamilton Co., Waterbury, Conn.
Upson & Hart Co., Unionville, Ct.

**Sporting Goods.**
Hartley & Graham, 313-315 B'way, N.Y

**Springs.**
Dunbar Bros., Bristol, Conn.
Miller & Van Winkle, Brooklyn, N. Y
Morgan Spring Co., Worcester, Mass
Nourse, Fred. Co., 315 to 319 E. 22d St., N. Y.
Roland, Wm. & Harvey, Phila., Pa.
Sabin Machine Co., Montpelier, Vt
Tuck Mfg. Co., Brockton, Mass
Washburn & Moen Mfg. Co., Worcester, Mass.
Wolff, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.

**Spring Hinges.**
Bardsley, J., 149 & 151 Baxter St., N.Y.
Pullman Sash Balance Co., Rochester N. Y.
Stover Mfg. Co., Freeport, Ill.
Van Wagoner & Williams Co., 14 Warren St., N. Y.

**Stamped Ware.**
Am. Stamping Co., 104 & 106 John St, New York.

**Stamping Works.**
Cleveland Stamping & Tool Co., Cleveland, O.

**Staples.**
Cobb & Drew, Plymouth, Mass.
Titchener E. H. & Co. Binghamton N.Y

**Steam Gauges.**
Ashcroft Mfg. Co., 111 Liberty St., N.Y
Bristols Mfg. Co., Waterbury, Conn.

**Steam Hammers, &c.,** *Makers of*
Dienelt & Eisenhardt, Philadelphia.
Dudgeon, Richard, 24 Columbia Street, N. Y.
Trethewey Mfg. Co., Pittsburgh, Pa.

**Steam Heating.**
Webster Warren & Co., Camden, N.J.

**Steam Separators.**
Goubert Mfg. Co., 32 Cortland St N. Y.
Harrison Safety Boiler Wks. Phila. Pa

**Steel, Cold Rolled Strip.**
Wilmot & Hobbs Mfg. Co., Bridgeport Conn.

**Steel Figures and Alphabets.**
Hoefig, C. W., 52 Fulton St., N. Y.
Krogsrud, W., 61 Fulton N. Y.
Wolff, C. H., 177 William St., N. Y.

**Steel Importers.**
Abbott, Wheelock & Co., N. Y. and Boston.
Hobson, Francis, Seaman & Co., 9 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.
Milne, A. & Co., 1 Broadway, N. Y.
Newton & Shipman, 88 John, N. Y.
Wetherell Bros., 93 Liberty St., N. Y
Whitney, A. R. & Co., B'dway, N. Y.
Wolff, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.

**Steel (Mushet's Special).**
Jones, B. M. & Co., Boston.

**Steel Manufacturers.**
Ætna-Standard Iron & Steel Co., Bridgeport,
Bethlehem Iron Co., S. Bethlehem, Pa
Boker, Hermnan & Co., 103 Duane St.
Carbon Steel Co., Pittsburgh, Pa.
Chester Steel Castings Co., Phila., Pa.
Chrome Steel Works, Brooklyn, N. Y.
Crescent Steel Co., Pittsburgh, Pa.
Elken & Co., Hagen, Germany.
Frankford Steel Co., Philadelphia.
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.
Hobson, Francis, Seaman & Co., 9 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.
Kayser, Ellison & Co., Sheffield, Eng.
La Belle Steel Co., Pittsburgh, Pa.
Lukens Iron & Steel Co., Coatesville, Pa
Moorhead-McCleane Co., Pittsburg Pa
Moss, F. W., 83 John N. Y
Naylor & Co., 45 Wall, N. Y.
Pottsville Iron and Steel Co., Pottsville, Pa.
Rowland, Wm. & Harvey, Frankford Philadelphia.
Singer, Nimick & Co., Pittsburgh.
Stanley Works, New Britain, Conn.
Steel & Iron Improvement Co., Pittsburgh, Pa.
Taylor Iron & Steel Co. High Bridge, N.J
Wardlaw, S. & C., Sheffield, Eng
Wetherell Bros., 93 Liberty, N. Y.
Wilmot & Hobbs Mfg. Co., Bridgeport Conn

**Steel,** *Manufacturers' Agents.*
Barnes, C. K. & Co., Philadelphia, Pa
Corning, Edw, & Co., 29 B'way, N. Y
Frasse Co., 19 Warren St., New York.
Lindsay, Jas. G. & Co., Phila., Pa.
Pierson & Co., 29 Broadway, N. Y.

**Steel Rails,** *Manufacturers of.*
Bethlehem Iron Co., S. Bethlehem, Pa
Cambria Iron Co., Johnstown, Pa.
Montour Iron & Steel Co., Danville Pa
Riverside Iron Wks., Wheeling, W. Va

**Steel, Tool.**
Frankford Steel Co., Philadelphia. Pa.
Jessop, Wm. & Sons, Sheffield, England, 91 John, N. Y.
Jones, B. M. & Co., Boston, Mass.
La Belle Steel Co., Pittsburgh, Pa.

**Step Ladders.**
Bicycle Step Ladder Co., Chicago, Ill,
Croissant, M., Albany, N. Y.

**Stocks and Dies.**
Armstrong Mfg. Co., Bridgeport, Conn
Billings & Spencer Co., Hartford, Conn.
Butterfield & Co., Derby Line, Vt.
Hart Mfg. Co., Cleveland, O.
Saunder's Sons, D., Yonkers, N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield Mass.

**Stove Linings.**
Ostrander Fire Brick Co., Troy, N. Y

**Stove Pipe Thimbles.**
Cheney, S. & Son Manlius, N. Y

**Stove Trimmings.**
Troy Nickel Works, Troy, N. Y.

**Street Lamps.**
Steam Gauge & Lantern Co., Syracuse N. Y.

**Strops.**
Electric Cutlery Co. 113 Chambers, N.Y
J. R. Torrey & Co., Worcester, Mass.

**Structural Iron Work.**
Berlin Iron Bridge Co., East Berlin, Conn.
Boston Bridge Wks., Boston, Mass.
Lindsay, Jas. G. & Co., Phila., Pa.
Wrought Iron Bridge Co., Canton, O.

**Sulphuric Acid.**
Matthiessen & Hegeler Zinc Co. La Salle, Ill.

**Tacks, Brads, Staples, &c.**
Atlas Tack Corporation. Boston, Mass
Clendenin Bros., Baltimore, Md.
Cobb & Drew, Plymouth, Mass.
Grand Crossing Tack Co., Grand Crossing, Ill.
Nat. Screw & Tack Co., Cleveland O.
Phillips, E. & Sons, South Hanover.
Trufant, W. E., Whitman, Mass.

**Taps and Dies.**
Butterfield & Co., Derby Line, Vt.
Carpenter, J. M., Tap & Die Co., Pawtucket, R. I.
Manning, Maxwell & Moore, 111 Liberty St., N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

**Testing Laboratories.**
Riehle Bros. Testing Mch. Co., Philadelphia.

**Testing Machines.**
Riehle Bros. Testing Mch. Co., Phila.

**Theatrical Hardware.**
Wollensak, J. F., Chicago, Ill.

**Thill Springs.**
Frost Thill Spring Co., Boston, Mass.
Sabin Machine Co., Montpelier, Vt.

**Time Record.**
Scattergood, H. W., Phila., Pa.

**Tinners' Hardware.**
Berger Bros., Philadelphia, Pa.

**Tinning Process.**
Sands, Thomas, Nashua, N. H.

**Tin Plate Machinery.**
Lloyd Booth Co., Youngtown, Ohio.

**Tinware.**
Am. Stamping Co., 104 & 106 John St.,

**Tire Upsetters.**
Butts & Ordway, Boston, Mass,

**Toe Calks, Steel.**
Burke, P. F., Boston, Mass.

**Tool Chests.**
Am. Tool Co., 200 W. Houston St., N.Y.

**Tools.**
Brown, R. H. & Co., New Haven, Conn.
Frasse Co., 19 Warren St., New York.
Mayhew, H. H. Co., Shelburne Falls, Mass.
Millers Falls Co., 93 Reade, N. Y.
Richardson, C. F. & Son, Athol, Mass.
Standard Tool Co., Athol, Mass.
Stanley Rule & Level Co., 29 Chambers,
Starrett, L. S., Athol, Mass.

**Tools, Blacksmith and Wheelwrights.**
Buffalo Forge Co., Buffalo, N. Y.
Butts & Ordway Boston, Mass.
Champion Blower & Forge Co., Lancaster, Pa.
Plumb, Fayette R. Philadelphia, Pa.
Wiley & Russell Mfg. Co., Greenfield, Mass.

**Tools, Steam and Gas Fitters'**
Saunders' Sons, D., Yonkers, N. Y.

**Torches, Oil and Gasolene.**
Dangler Stove & Mfg. Co., Cleveland, O.
Schneider & Trenkamp Co., Cleveland, Ohio.

**Transom Lifters.**
Wollensak, J. F. Chicago, Ill.

**Trucks.** *Manufacturers of.*
Berger Bros., Philadelphia, Pa.
Boston & Lockport Block Co., Boston, Mass., and Lockport, N. Y.
Clark, G. P., Windsor Locks, Conn.
Lansing Wheelbarrow Co. Lansing Mich.

**Tubes, Seamless Drawn Copper.**
Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.
Randolph & Clowes, Waterbury, Conn.

**Tubes, Steel.**
Ellwood Shafting & Tube Co., Ellwood City, Pa.
Leng's John S. Son & Co., 4 Fletcher St., New York.

**Tumbling Barrels.**
Henderson Bros., Waterbury, Conn.

**Turnbuckles.**
Cleveland City Forge & Iron Co., Cleveland, O.
Merrill Bros., Brooklyn, E. D.

**Twist Drills.** *Makers of.*
Cleveland Twist Drill Co., Cleveland.
Morse Twist Drill & Machine Co., New Bedford, Mass.
New Process Twist Drill Co., Taunton, Mass.
Standard Tool Co., Cleveland.

**Valves, Gas, Water and Steam.**
Best, Fox & Co., Pittsburgh, Pa.
Chapman Valve Mfg. Co., Boston.
Eynon-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., 71 John, N. Y.
McNab & Harlin Mfg. Co., 56 John N. Y.
Mason Regulator Co., Boston, Mass.

**Ventilator Appliances.**
Howard & Morse, 45 Fulton, N. Y.

**Vise Jaws.**
Newark Mch. Tool Co., Newark, N. J.

**Vises.**
Capital Mch. Tool Co., Auburn, N. Y.
Hollands Mfg. Co., Erie, Pa.
Howard Iron Works, Buffalo, N. Y
Millers Falls Co., 93 Reade St., N. Y.
Prentiss Vise Co., 44 Barclay N. Y.
Van Wagoner & Williams Co., 14 Warren St., N. Y.

**Wagon Jacks.**
Boston & Lockport Block Co., Boston, Mass., and Lockport, N. Y.
Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Works, Farmer, N. Y

**Washers.**
Haskell, Wm. H. Co., Pawtucket, R. I.
Milton Mfg. Co., Milton, Pa.
Sternbergh, J. H. & Son, Reading, Pa.

**Water Meters.**
Worthington, Henry R., 86 & 88 Liberty St., N. Y.

**Water Wheels.**
Poole, Robt. & Son Co., Baltimore, Md.

**Wheelbarrows.**
Akron Tool Co., Akron, O.
Amer. Steel Scraper Co., Sidney, Ohio.
Cockburn Barrow & Mch. Co., Jersey City, N. J.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Lansing Wheelbarrow Co., Lansing, Mich.
Sidney Steel Scraper Co., Sidney, O.
Sweatt Mfg. Co., Minneapolis, Minn.

**Whips.**
American Whip Co., Westfield, Mass,

**Window Cord,** *Makers of.*
Samson Cordage Works, Boston, Mass

**Wire,** *Manufacturers of.*
Consolidated Steel & Wire Co., St. Louis, Mo.
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.
Miller & Van Winkle, Brooklyn, N. Y.
New Castle Wire Nail Co., New Castle, Pa.
New Haven Wire Mfg. Co., New Haven, Conn.
Salem Wire Nail Co., Salem, O.
Trenton Iron Co., Trenton, N. J.
Washburn & Moen Mfg. Co., Worcester
Wetherell Bros., 93 Liberty St., N. Y.
Wolff, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
Wright & Colton Wire Cloth Co. Worcester, Mass

**Wire Cloth.**
Barnum, E. T., Detroit, Mich.
Clinton Wire Cloth Co., Clinton, Mass.
Darby, Edward & Sons, Philadelphia.
Estey, W. S., 65 Fulton, N. Y.
Gilbert & Bennett Mfg. Co., 42 Cliff.
Howard & Morse, 45 Fulton, N. Y.
N. J. Wire Cloth Co., Trenton, N. J.
Prentiss, Geo. W. & Co., Holyoke, Mass.
Reliance Wire & Iron Wks. Milwaukee Wis.
Scheeler & Sons, Buffalo, N. Y.
Wickwire Bros., Cortland, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.
W. S. Tyler Wire Works Co., Cleve'd.

**Wire Cutters.**
King, J. M. & Co., Watertown, N. Y.

**Wire Dies.**
McFarland, Wm., Trenton, N. J.
Newton & Shipman, 88 John, N. Y.

**Wire Fences.**—*See Fencing, Iron and Wire.*

**Wire Goods,** *Manufacturers of.*
Darby, Edward & Sons, Phila.
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
Ludlow-Saylor Wire Co., St. Louis.
Ossawan Mills Co., Norwich, Conn.
Scheeler & Sons, Buffalo, N. Y.
Wickwire Bros, Cortland, N. Y.
Williamson, C. T. Wire Novelty Co. Newark, N. J.

**Wire Machinery.**
Am. Tool Wks., Cleveland, O.
Manville, E. J. Mch. Co., Waterbury, Ct.
Morgan Construction Co., Worcester Mass.
Waterbury Mch. Co., Waterbury, Conn

**Wire Straightening and Cutting Machinery.**
Adt, John & Son, New Haven, Conn.

**Wire Nails.**
Consolidated Steel & Wire Co., St. Louis, Mo.
Indiana Wire Fence Co., Crawfordsville, Ind.
Kilmer Mfg. Co., Newburg, N. Y.
New Castle Wire Nail Co., New Castle Pa.
Phillips, E. & Sons, South Hanover Mass
Phillips, Townsend & Co., Phil., Pa.
Salem Wire Nail Co., Salem, O.
Whitney, A. R. & Co., New York City

**Wire Rods. Steel.**
Consolidated Steel & Wire Co., St. Louis, Mo.
New Castle Wire Nail Co., New Castle Pa.
Washburn & Moen Mfg. Co., Worcester, Mass.
Whitney, A. R. & Co., 17 B'way, N. Y.
Wolff, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y

**Wire Rope, Iron and Steel** *Makers.*
Broderick & Bascom Rope Co., St. Louis, Mo.
California Wire Works, San Francisco
Hazard Mfg. Co., Wilkesbarre, Pa.
A. Leschen & Sons Rope Co., St. Louis
Trenton Iron Co., Trenton, N. J.
Washburn & Moen Mfg. Co., Worcester Mass.
Williamsport Wire Rope Co., Williamsport, Pa.

**Wood-Working Machinery.**
Seneca Falls Mfg. Co., Seneca Falls, N. Y

**Wrenches,** *Manufacturers of.*
Bemis & Call Hardware & Tool Co. Springfield, Mass.
Billings, Spencer & Co., Hartford, Conn
Capitol Mfg. Co., Chicago, Ills.
Coes Wrench Co., Worcester, Mass.
Keystone Mfg. Co., Buffalo, N. Y.
Trimont Mfg. Co., Roxbury, Mass.
Williams, J. H., Brooklyn, N. Y.

**Wringers.**
Colby Wringer Co., Montpelier Vt.
Peerless Mfg. Co., Cleveland, Ohio.

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Atlas Mfg. Co 85
Atlas Tack Corporation. 11
Babcock & Wilcox Co. 34
Baeder, Adamson & Co. 58
Banker & White 65
Bardsley, J. 78
Barns, C. K. & Co. 21
Barnes, W. F. & John. 39
Barnett, G. & H. 65
Barney & Berry. 70
Barnum, E. T. 9
Bass Foundry & Machine Works. 32
Belden Machine Co. 39
Bell, Geo. E. 49
Bellevue Pump Co. 61
Bement, Miles & Co. 41
Bemis & Call Hardware & Tool Co. 84
Berger Bros. 61
Berlin Iron Bridge Co. 10
Best, Fox & Co. 3
Bethlehem Iron Co. 21
Bevin Bros. Mfg. Co. 71
Bickford Drill & Tool Co. 46
Bicycle Step Ladder Co. 78
Bigelow, C. R. 51
Bignall & Keeler Mfg. Co. 43
Billings & Spencer Co. 84
Bingham, W. Co. 68
Birmingham Iron Foundry. 23
Bissell, E. Son & Co. 54
Blake & Johnson. 12
Bliss Co., E. W. 38
Boardman, L. & Son. 71
Bogert, John L. 55
Boker, Hermann & Co. 18
Boone, W. C. Mfg. Co. 25
Booth, The Lloyd Co. 28
Borden & Lovell. 11
Borgner, Cyrus. 28
Boston Bridge Works 15
Boston Gear Works. 33
Box, Alfred & Co. 46
Boyce Rivet Co. 98
Bradlee & Co 16
Bradley Fertilizer Co. 44
Brass Goods Mfg. Co. 2
Bridgeport Chain Co. 68
Bridgeport De-oxidized Bronze & Metal Co. 2
Bridgeport Gun Implement Co. 52
Briggs, Marvin. 51
Bristols' Mfg. Co. 1
Britton, J. Blodgett. 27
Broderick & Bascom Rope Co 6
Bronson Supply Co. 74
Brown, E. E. & Co 79
Brown Hoisting & Conveying Mch. Co. 36
Brown, R. H. & Co. 58
Bryden Horse Shoe Co. 81
Buck Bros. 67
Buckeye Engine Co. 32
Buffalo Forge Co. 98
Buffalo Scale Co. 84
Buffalo Edge Tool Works. 66
Buffalo Specialty Mfg. Co. 67
Bullock Bellows Co. 40
Burden Iron Co. 81
Burditt & Williams. 73
Burgess & Loxley 98
Burke, P. F 83
Burr & Houston Co. 28
Bussenius & Cunliffe. 52
Butterfield & Co. 44
Butts & Ordway. 43
C. & C. Electric Co. 29
California Wire Works. 5
Cambria Iron Co 19
Cambridge Iron & Steel Co. 23
Cambridge Roofing Co. 15
Canfield, H. O. 37
Capewell Horse Nail Co. 82
Capital Machine Tool Co. 60
Capitol Mfg. Co. 85
Carbon Steel Co. 20
Carlin's Sons, Thomas. 50
Carpenter, J. M. Tap & Die Co. 97
Chadborne & Coldwell Mfg. Co. 88
Chambers Bros. Co. 90
Champion Blower & Forge Co. 44
Champion Iron Co. 7
Chapman Mfg. Co. 98
Chapman Valve Mfg. Co. 32
Chatillon, John & Sons. 73
Cheney, S. & Son. 23
Chess Bros. 23
Chester Steel Casting Co. 25
Chrome Steel Works. 24
Church, Isaac. 90
Cincinnati Milling Mch. Co 49
Clafien Mfg. Co. 37
Clapp, Geo. M. 51
Clark, H. P. 86
Clark & Cowles. 9
Clarke, Thomas. 62
Clendenin Bros. 12
Cleveland Block Co. 79
Cleveland City Forge & Iron Co. 1
Cleveland Stamping & Tool Co. 72
Cleveland Stone Co. 49
Cleveland Twist Drill Co. 45
Clinton Wire Cloth Co. 8
Cobb & Drew. 12
Coburn Trolley Track Mfg. Co. 76
Cockburn Barrow & Machine Co. 86
Coes, Loring & Co. 85
Coes Wrench Co. 85
Coffin & Leighton. 40
Colburn, A. M. 44
Colburn Electric Mfg. Co. 29
Colby Wringer Co. 77
Coldwell Lawn Mower Co. 87
Colliau, Victor. 27
Conroy, P. J. & Co. 79
Consolidated Steel & Wire Co. 14
Continental Iron Works. 32
Copeland & Bacon. 38
Corbin, P. & F. 76
Corning, Edw. & Co. 16
Correspondence School of Mechanics 97
Cotton, Barclay W. & Co. 16
Coulter & McKenzie Machine Co. 40
Covert Mfg. Co. 82
Covert's Saddlery Works. 57
Cox, Justice, Jr. 17
Cramp, Wm. & Sons S. & E. B. Co. 3
Crescent Horse Shoe & Iron Co. 83
Crescent Phosphorized Metal Co. 3
Crescent Steel Co. 20
Cresson, Geo. V. Co. 43
Croissant, M. 78
Crosby, G. A. & Co. 39
Crosby Steam Gage & Valve Co. 3
Cross & Speirs Machine Co. 42
Crown Smelting Co. 3
Cumberland Nail & Iron Co. 17
Cushman Chuck Co. 44
Dallett, Thos. H. & Co. 45
Dame, Stoddard & Kendall. 70
Dangler Stove & Mfg. Co. 73
Darby, Edw. & Sons. 8
Davis & Cook. 58
Davis, I. B. & Son. 29
Davol, John & Sons. 2
Dayton Malleable Iron Co. 98
Dean Bros. Steam Pump Works. 35
Deitz, A. E. 85
Deming Co. 60
Detrick & Harvey Machine Co. 47
Detroit Foundry Equipment Co. 27
Diamond Clamp & Flask Co. 98
Diamond State Iron Co. 81
Dienelt & Eisenhardt. 41
Dille & McGuire Mfg. Co. 88
Disston, Henry & Sons. 63
Dixon, Jos., Crucible Co. 37
Donaldson Iron Co. 28
Doscher, Martin. 67
Douglas, W. & B. 60
Draper Machine Tool Co. 50
Dudgeon, Richard. 42
Durbar Bros. 5
Dunham Nut Machine Co. 55
Durant, W. N. 35
Dwight Slate Machine Co. 40
Eagle Bicycle Mfg. Co. 97
Eccles, Richard 79
Edge Moor Iron Co. 28
Eicken & Co. 19
Electric Cutlery Co. 68
Ellwood Shafting & Tube Co. 6
Emory, P. P. Mfg. Co. 11
Empire Portable Forge Co. 71
Enterprise Mfg. Co. of Pa. 75
Erie Engine Works 33
Estey, W. S. 12
Ette & Henger Mfg. Co. 89
Etting, Edw. J. 17
Eureka Cast Steel Co. 98
Evans-Friction Cone Co. 3
Eynon-Evans Mfg. Co 31
F. & N. Mfg. Co. 88
Fairmount Machine Co. 47
Fearing, Wm. S. 2
Ferdinand, L. W. & Co. 71
Field, Alfred & Co. 66
Fitch, W. & E. T. 97
Fitchburg Machine Works 41
Fitzsimons & Co. 17
Flagg, Stanley G. & Co. 98
Forehand Arms Co. 72
Fraim, E. T. 2 & 77
Frankford Steel Co. 19
Franklin, H. H. Mfg. Co. 52
Frasse Co. 24
Frost Thill Spring Co. 79
Fulton Iron & Engine Works. 46
Gardner, Jas. & Son. 25
Garrison, A., Foundry Co. 23
Gartland Foundry Co. 25
Garvin Machine Co. 51
Gautier Steel Department 15
Gaylord, F. L. Co. 3
Gibbs Mfg. Co 87
Gilbert & Bennett Mfg. Co. 8
Gleason Tool Co. 33
Glazier Stove Co. 57
Goodell Co. 68
Goubert Mfg. Co. 34
Gould & Eberhardt. 37
Graham, John H. & Co. 74
Grand Crossing Tack Co. 11
Grant Corundum Wheel Mfg. Co. 48
Green, A. H. 59
Gurney, F. B. 67
Haight & Clark. 28
Haines & Zimmermann. 71
Haines Gauge Co. 29
Halk & Naumann. 3
Halsey, Jas. T. 44
Halsey, W. S. & Co. 25
Hamilton Machine Tool Co. 42
Hammer & Co. 84
Hardware Board of Trade. 53
Harrington, E., Son & Co. 47
Harrington & King Perforating Co. 9
Harrison Safety Boiler Wks. 29
Hart, Henry C. Mfg. Co. 71
Hart Mfg. Co. 45
Hartford Steam Boiler Insp. and Ins. Co. 31
Hartley & Graham. 1
Haskell, Wm. H. Co. 90
Hazard Mfg. Co. 6
Heinisch's R. Sons Co. 67
Henderer, A. L. 41
Henderson Bros. 25
Hendey Machine Co. 56
Hendricks Bros. 2
Hendrick Mfg. Co., Ltd. 7
Hendryx, A. B. Co. 3
Henley, M. C. 72&88
Herrick, J. A. 26
Hiertz, T. & Son. 4
Hiles, C. A. & Co. 62
Hillebrand & Wolf. 43
Hill, Clarke & Co. 51
Hobson, F., Seaman & Co. 18
Hoefig, C. W. 5
Hoffman, C & A. 66
Hoffman, J. W. & Co. 17
Hogan, John L. & Co. 17
Hollands Mfg. Co. 61
Holmes & Edwards Silver Co. 69
Holt, Hiram & Co. 89
Hooker-Colville Steam Pump Co. 50
Hotchkiss, E. S. 74
Houston, C. B. & Co. 17
Howard Iron Works. 79
Howard & Morse. 7
Howson & Howson. 6
Ideal Mfg. Co. 71
Illinois Pure Aluminum Co. 62
Indiana Wire Fence Co. 7
Ives, H. B. & Co. 79
Jacobus, W. H. 90
Jarecki Mfg. Co. 40
Jeffrey Mfg. Co. 36
Jenkins Bros. 1
Jenkins & Lingle. 39
Jenner, H. W. T. 6
Jessop, Wm. & Sons. 18
Johns, H. W. Mfg. Co. 15
Johnson, I. G. & Co. 98
Johnson, I. H., Jr., & Co. 46
Johnson, S. C. 86
Jones, B. M. & Co. 21
Jones, Jesse & Co. 62
Jones & Lamson Machine Co. 56
Kayser, Ellison & Co. 18
Keeley, Jerome & Co. 17
Kennedy, Julian. 26
Keuffel & Esser Co. 61
Keyless Lock Co. 77
Keys, W. W. & R. M. Co. 3
Keystone Clutch & Machine Works. 44
Keystone Mfg. Co. 59
Kilbourne & Jacobs Mfg. Co. 86
Kilmer Mfg. Co. 7
King, J. M. & Co. 65
Knapp & Cowles Mfg. Co. 69
Koch, A. B. & Co. 66
Kohler, F. E. & Co. 88
Konigslow, Otto. 87
Kreischer, B. & Sons. 25
Krogsrud, W. 71
La Belle Steel Co. 22
Laflin & Rand Powder Co. 23
Lake, J. H. & D. Co. 47
Lane Brothers. 77
Lansing Wheelbarrow Co. 86
Laughlin, Alex & Co. 26

Lea, J. Tatnall & Co. 22
Lean, D. R. Co. 27
Le Count, C. W. 81
Leechburg Foundry & Machine Co. 24
Le Massena, C. E. & Co. 49
Leng's, Jno. S. Son & Co. 98
Leonard, B. E. 85
Leonard, J. 21
Leschen, A. & Sons Rope Co. 6
Levis, Henry & Co. 21
Lidgerwood Mfg. Co. 98
Lindsay, Jas. G. & Co. 17
Link-Belt Engineering Co. 39
Lockhart Iron & Steel Co. 22
Long & Allstatter Co. 26
Lovell, Jno. P. Arms Co. 71
Lovell Mfg. Co., Ltd. 55
Lovell, Tracy & Co. 83
Lovegrove & Co. 51
Ludlow-Saylor Wire Co. 7
Lufkin Rule Co. 61
Lukens Iron & Steel Co. 16
Lundberg, Gustaf. 18
McCabe, J. J. 50
McCaffrey File Co 65
McClure, Amsler & Co. 26
McCoy, Jos. F. & Co. 62
McFarland, Wm. 4
McGowan, J. H. & Co. 35
McIlvain, Wm. & Sons 27
McKay, Jas. & Co 17
McKinney Mfg. Co. 76
McLean, John 32
McLeod & Henry Co. 25
McNab & Harlin Mfg. Co. 32
Machinists' Supply Co. 51
Mackey, James T. 33
Mahoning Foundry&Machine Shop. 24
Mahoning Valley Iron Co. 21
Main Belting Co. 37
Manning, Maxwell & Moore 45
Manville Machine Co., E. J. 49
Mansfield, H. H. 51
Maris & Beekley 47
Maslin, J. & Son 35
Mason Regulator Co. 97
Mast, Foos & Co. 89
Matthiessen & Hegeler Zinc Co. 2
Maurer, H. & Son 25
Mayhew, H. H. Co 59
Merrill Bros. 17
Merrill Mfg. Co. 42
Merriman, A. H. 43
Miles, F. S. 4
Miller & Van Winkle 4
Miller Lock Co. 77
Millers Falls Co. 58 & 93
Milne, A. & Co. 19
Milton Mfg. Co. 89
Miner & Peck Mfg. Co. 40
Mohr, J. J. 17
Monce, S. G 84
Montour Iron & Steel Co. 21
Moore, Dr. Gideon E 56
Moore Mfg. & Foundry Co. 47
Moore & White Co. 44
Moorhead-McCleane Co. 22
Morgan Construction Co. 4
Morgan Spring Co. 4
Morrison, Robert. 33
Morse Twist Drill & Machine Co. 45
Morse, Williams & Co. 47
Morton, Thos. 78
Moseley Iron Bridge & Roof Co. 7
Mount Carmel Bolt Co. 97
Myers, F. E. & Bro. 60
National Horse Nail Co. 83
National Manufacturing Co 66
National Pipe Bending Co. 31
National Saw Co. 62
National Screw & Tack Co. 11
Naylor & Co. 21
Newark Machine Tool Works. 56
New Britain Hardware Mfg. Co. 86
New Castle Wire Nail Co. 12
New Haven Copper Co. 2
New Haven Mfg Co. 42
New Haven Wire Mfg. Co. 6
N. J. Wire Cloth Co. 8
New Process Twist Drill Co. 45
Newton & Shipman. 18
N. Y. Belting & Packing Co. 37
N. Y. Machinery Depot. 50
N. Y. Mallet & Handle Works 66
N. Y. Powder Co. 23
Niagara Stamping & Tool Co. 40
Nicholson File Co. 65
Nicolls, Wheeler & Co. 16
Niles Tool Works. 51
North Bros. Mfg. Co. 17
North Bros. Mfg. Co. 57
Northampton Cutlery Co. 68
Northampton Emery Wheel Co. 49
Norton Emery Wheel Co. 48
Norton & Jones Machine Tool Works. 36
Norwalk Iron Works Co. 35
Nourse, Fred Co. 5
Nubian Iron Enamel Co. 31
Obermayer, S. Co. 20
Ogden & Wallace. 21
Ohio Lantern Co. 72
Old Dominion Iron & Nail Works Co. 83
Osborn, G. Edw. & Co. 35
Ossawan Mills Co. 97
Ostrander Fire Brick Co. 25
Ostrander, W. R. & Co. 58
Otto Gas Engine Works. 33
Oxford Iron & Nail Co. 12
Packer, C. W. 57
Palmers & De Mooy. 25
Palmer Hardware Mfg. Co. 58
Pancoast Henry B. & Co. 43
Passaic Rolling Mill Co. 21
Peabody & Parks. 62
Peck, A. G. & Co. 98
Peerless Mfg. Co. 75
Penna. Diamond Drill & Mfg. Co. 33
Pennsylvania Mch. Co. 50
Perry, W. H. & Co. 50
Philadelphia Drop Forge Co. 28
Philadelphia Engineering Wks. 36
Phillips, E. & Sons. 11
Phillips, Townsend & Co. 12
Phœnix Horseshoe Co. 81
Phœnix Iron Co. 16
Phœnix Iron Works Co. 33
Phosphor Bronze Smelting Co. 3
Pierson & Co 20
Pike Mfg. Co. 49
Pilling & Crane. 17
Pittsburgh I. & S. Eng. Co. 26
Pittsburgh Mfg. Co 41
Pittsburgh Reduction Co. 56
Place, Geo. 50
Plumb, Fayette R. 68
Plume & Atwood Mfg. Co. 2
Pollock, W. B. & Co. 32
Poole, Robt. & Son Co. 84
Pope Mfg. Co. 57
Popping, J. 55
Port Chester Bolt & Nut Co. 90
Pottstown Iron Co. 19
Pottsville Iron & Steel Co. 16
Powell Planer Co. 41
Pratt & Whitney Co. 46
Prentiss, Geo. W. & Co. 6
Prentiss Tool & Supply Co 50
Prentiss Vise Co. 60
Pullman, J. Wesley 22
Pullman Sash Balance Co. 78
Putnam Nail Co. 64
Queen Anne Screen Co. 79
Quint, A. D 42
Rainey, W. J. 1
Rand Drill Co. 34
Randolph & Clowes 1
Read, Wm. & Sons. 97
Reading Hardware Co. 77
Reece, Edw. F. 44
Reeves, Paul S. 98
Reliance Wire Wks Co. 8
Reynolds & Co. 11
R.I. Perkins Horse Shoe Co. 81
Rice, C. F. 55
Richardson, C. F. & Son. 69
Ridgway, Craig & Son. 48
Riehlé Bros. Testing Machine Co. 38
Ripley Mfg. Co. 71
Riverside Iron Works. 24
Roberts, A. & P. & Co. 19
Roberts, Frank C. & Co. 26
Roberts Mfg. Co. 36
Robinson-Rea Mfg. Co. 25
Rogers & Hamilton Co. 61
Rogers, The Wm. Mfg. Co. 69
Rollason Gas Engines. 33
Rouse, Duryea Cycle Co. 57
Rowland, Wm. & Harvey. 98
Russell, Burdsall & Ward. 98
Russia Cement Co. 59
St. Louis Bronze & Aluminum Works 2
Sabin Machine Co. 4
Salem Foundry & Machine Shop. 44
Salem Wire Nail Co. 12
Samson Cordage Works. 1
Samuel, Frank. 16
Sands, Thomas 53
Saunder's Sons, D. 42
Scattergood, H. W. 55
Schaeffer & Co 87
Scheeler & Sons. 6
Schneider & Trenkamp Co. 75
Scott, Geo. M. 41
Scoville Mfg. Co. 2
Scranton Forging Co. 81
Scranton Supply & Machine Co. 50
Seaman, Sleeth & Black. 23
Sellers, Wm. & Co. 47
Seneca Falls Mfg. Co. 46
Sessions Foundry Co. 25
Seyfert's Sons, L. F. 50
Shepard, Sidney & Co. 73
Shipman Engine Co 33
Shoenberger & Co 80
Shultz Belting Co. 1
Sibell, Geo. H. & Co. 51
Sibley & Ware 46
Sickels, Sweet & Lyon. 71
Sidney Steel Scraper Co 87
Sigourney Tool Co. 40
"Silver Finish". 5
Silver Mfg. Co. 55
Simonds Mfg. Co. 62
Singer, Nimick & Co. 22
Smith & Egge Mfg. Co. 46
Smith, H. D. & Co. 83
Smith, J. D. Foundry Supply Co. 25
Smith, Lyon & Field 69
Smythe, S. R. Co., Inc. 26
Sommer's Son, John 98
Southwark Foundry & Machine Co. 33
Speidel, J. G. 47
Speirs, J. C. & Co. 23
Spencer's I. S. Sons. 28
Standard Fdry. & Mfg. Co. 21
Standard Horse Shoe Co. 81
Standard Steel Casting Co. 98
Standard Tool Co. 45
Standard Tool Co. 59
Stanley Rule & Level Co. 97
Stanley Works. 57
Stark Mch. & Tool Co. 39
Starrett, L. S. 61
Steam Gauge & Lantern Co. 73
Stearns, E. C. & Co. 56
Stechert, G. E. 48
Steel & Iron Improvement Co. 56
Steptoe, J. & Co. 52
Sterling Emery Wheel Co. 48
Sternbergh, J. H. & Son. 90
Stevens Arms & Tool Co. 74
Stiles & Parker Press Co. 38
Stocking, E. B. 6
Storm Mfg. Co. 60
Stover Mfg. Co. 79
Stow Flexible Shaft Co. 45
Stow Mfg. Co. 45
Sturtevant, B. F. Co. 41
Supplee Hardware Co. 88
Sweatt Mfg. Co. 87
Sweetser, W. A. 26
Swindell, W. & Bros. 27
Syracuse Specialty Mfg. Co. 87
Taintor Mfg. Co. 65
Tablet & Ticket Co 55
Talcott, W. O. 37
Taylor Iron & Steel Co. 24
Thomson, W. H. & Co. 17
Tiebout, W. & J. 78
Titchener, E. H. & Co. 7
Tod, Wm. & Co. 32
Toomey, Frank. 51
Torrey, J. R. Razor Co 67
Totten & Hogg Iron and Steel Fdry. Co. 23
Townsend, W. P. & Co. 90
Trenton Iron Co. 4
Threthewey Mfg. Co. 26
Trimont Mfg. Co. 84
Troy Nickel Works. 67
Tuck Mfg. Co. 5
Tudor Iron Works. 1
Tyler Wire Works Co. W. S. 56
Union Mfg. Co. 46
Union Metallic Cartridge Co. 1
Upson & Hart. 69
Valentine, M. D. & Bro. 28
Vallentine Tool Co. 39
Valley Pump Works. 35
Van Dorn Iron Works Co. 7
Vanderbilt Sash Balance Co. 77
Van Wagoner & Williams Co. 98
Victor Mfg. Co. 78
Vulcan Iron Works. 23
Wallace Wm. H. & Co. 21
Wardlow, S. & C. 18
Washburn & Moen Mfg. Co. 4
Washburn Shops. 41
Waterbury Brass Co. 2
Waterbury Farrel Foundry & Machine Co. 35
Waterbury Machine Co. 43
Watson & Stillman. 42
Webster, Warren & Co. 30
Weiland, Chas. 52
Wellman Iron & Steel Co. 16
Wells Bros. & Co. 46
Western Wheel Works. 71
Wetherell Bros. 18&22
Wetherhill, Robt. & Co. 97
White, A. A. & Co. 79
White, L. & I. J. Co. 67
White Mt. Freezer Co. 57
Whitlock Coil Pipe Co. 31
Whitney, A. R. & Co. 20
Whitney, A. & Sons. 21
Whiton, D. E. Mch. Co. 44
Wickwire Bros. 7
Wilcox & Howe Co. 84
Wiley & Russell Mfg. Co. 43&98
Williams, J. H. & Co. 84
Williamson, C. T. Wire Nov. Co. 97
Williamsport Wire Rope Co. 6
Wilmot & Hobbs Mfg. Co. 1&98
Wilson, E. H. & Co. 17
Wilson, John. 66
Wilson, J. Fred. 89
Wilson, W. A. 41
Winslow, Sm'l, Skate Mfg. Co. 70
Wister, Francis. 17
Wister, L. & R. & Co. 21
Witherow, Jas. P. Co. 26
Wolcott & West. 55
Wolff, C. H. 77
Wolff, R. H. & Co. Ltd. 5
Wollensak, J. F. 59&79
Wood Alan & Co. 17
Wood, R. D. & Co. 28
Wood, W. Dewees Co. 22
Worcester Mch. Screw Co. 90
Worthington, Henry R. 35
Wright & Colton Wire Cloth Co. 8
Wrought Iron Bridge Co. 14
Wurster, F. W. & Co. 98
Wyman & Gordon. 28
Yale & Towne Mfg. Co. 47&59
Zucker & Levett Chem. Co. 29

# THE IRON AGE

THURSDAY, NOVEMBER 30, 1893.

## Steel Castings.

BY JOSEPH S. OWEN, CHICAGO, ILL.

Within the last ten years steel castings have come very extensively in use, but they have not given universal satisfaction. Invariably complaints come in about "blow holes." I cannot see what trouble there is to be feared if the holes are small—that is, if the general appearance of the casting is not bad, inasmuch as the solidity of a casting is obtained at the expense of the strength in general. Therefore, castings with blow holes are stronger than solid ones, everything else being equal chemically Blow holes can be prevented chiefly by the addition of silicon, aluminum and manganese in proper quantities and at the proper stage of the operation. About 17 years ago the properties of silicon in reference to the manufacture of steel castings became known and appreciated, and at that time attention was called to the fact in a paper which was read before the British Iron and Steel Institute on the manufacture of solid steel castings. In that communication attention was called to the fact that the gases produced in the manufacture of steel, alike by the Bessemer and open-hearth processes, were retained in the liquid metal and caused the blow holes, or air bubbles, that have been found in steel castings and are so difficult of expulsion. That is to say, the gases occluded in the liquid bath, and which when the metal becomes solid are still unexpelled, constitute the source of the honeycombed structure which was formerly so frequently to be met with. Silicon, however, when introduced at the proper time and in certain proportions into the liquid metal enables those blow holes to be got rid of and a solid steel to be produced. The rationale of this action of silicon has been much discussed among scientific metallurgists. So long as the only gas discovered in the liquid metal and in the blow holes of the solid metal was carbonic oxide the matter appeared to be simple enough, and the explanation of the effects of silicon which was suggested at that time was that silicon neutralized carbonic oxide in the production of silica and free carbon according to the formula $Si + 2CO = SiO_2 + 2C$. This explanation appeared to be satisfactory enough until Dr. Mueller discovered, and Mr. Richards and Mr. Stead afterward confirmed, the fact that the greater part of the gases occluded in the blow holes was not carbonic oxide at all, but was hydrogen resulting from the moisture of the air, hence the new problem was presented of the effect of silicon on hydrogen. These considerations led to the investigation of the phenomena of the increasing solubility of both carbonic oxide and hydrogen when silicon is present in sufficient quantities. This action is analogous to that which is obtained when limestone is dissolved in water in the presence of carbonic acid; however, such an explanation appears to be a little open to question still, in my way of thinking.

Aluminum in very small proportions produces a very marked effect on a bath of soft steel. In Osberg's petroleum furnaces, known as the Mitis process, from 0.05 to 0.10 of 1 per cent. of aluminum was added to metal low in carbon, being also fairly low in silicon. The results were very satisfactory for soundness and toughness. These results were obtained at one establishment in particular by the crucible process. Aluminum increases fluidity when working with steel low in carbon, but thickens to a certain extent high carbon metal. Aluminum seems to oxidize very quickly, as only traces are found in the castings by analysis. Aluminum, however, releases gases from metal through the suddenly increased fluidity, inasmuch as after the "stock" is melted gases are then taken up by the metal. "Killing" the steel is not necessary when aluminum is properly used by the crucible process.

For castings that are liable to draw and crack in cooling, manganese, in my opinion, is essential, its presence giving the casting strength when in the semi-solidified condition. Manganese when added to oxygenated iron removes the oxygen as oxide of manganese or silicate of manganese, thus it is a positive cure for red shortness by setting free intermixed particles of slag as a double silicate of manganese, at the same time being a strong carrier of sulphur in the slag. Steel foundrymen have a dread of high manganese in their castings, but the writer has seen steel castings carrying as high as 0.85 to 0.95 of manganese, which proved very tough and strong. This does not support the theory that 5 parts of manganese are equal to 1 part of phosphorus in producing brittleness.

## The Mansfield Disappearing Gun Carriage.

One of the most important questions at present confronting the army is that of carriages for the heavy guns and mortars intended for seacoast defense batteries. In this matter it appears that the guns have reached a degree of perfection, comparatively speaking, far in advance of the carriages.

It is therefore interesting to present a description of a design the invention of Lieut.-Col. S. M. Mansfield, Corps of Engineers, U. S. A. This system possesses an elasticity throughout which relieves the carriage from undue strain. Further, it is composed of few parts, which are strong, and there is no delicate machinery liable to get out of order. In the firing position the muzzle of the gun is put well over the parapet, where the blast of discharge will do it no injury. With a reduced charge of powder giving an initial velocity to the projectile of about 1800 feet a second the gun will recoil gently to the loading position. The excess of energy of recoil due to charges giving a projectile velocity up to 1975 feet is taken up by a hydraulic buffer in the rear of the lower carriage.

Inside of the parapet is a well, Fig. 4, in which is suspended a counterpoise from the upper carriage on which the gun is mounted. The top of the well is covered by a metal plate having a hole formed in it for the passage of the rope from the counterpoise. The lower carriage is adapted to be traversed in a horizontal plane as usual, its upper end being for this purpose pivoted on a hollow cylindrical hub projecting upward from the well cover. Journaled near the upper end of the lower carriage and arranged to roll on the well cover, or on a circular plate attached to its top, are wheels or rollers. The lower end is provided with a series of wheels rolling on a segment, as is com-

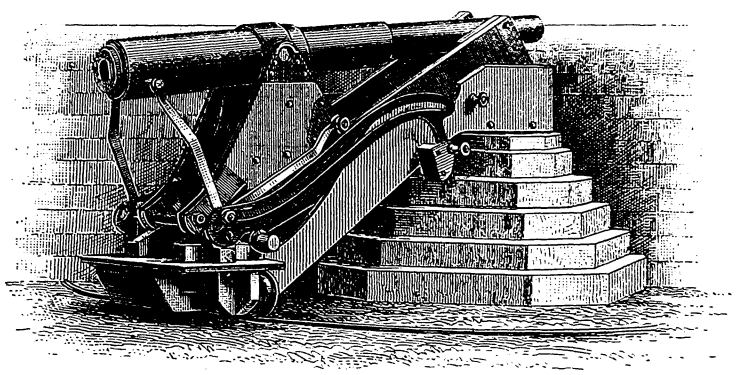


*Fig. 1.—Gun in Depressed Position.*

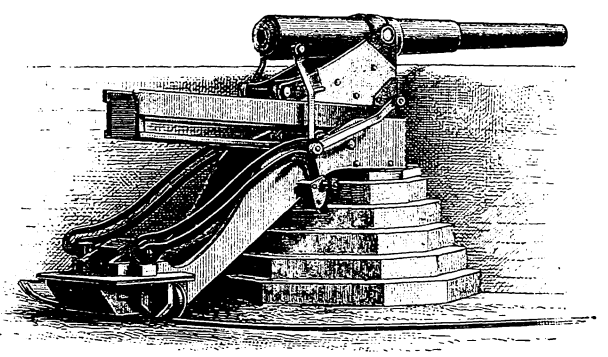


*Fig. 2.—Gun in Firing Position.*

THE MANSFIELD DISAPPEARING GUN CARRIAGE.

mon in gun carriages, shown plainly in Figs. 1 and 2. The chassis is between the upper and lower carriages, and is pivoted near its forward end to the lower carriage. The upper carriage is provided with wheels to act when the gun is run into battery, but during recoil the carriage rests upon its shoe, so as to cause a sliding and frictional resistance; the rear wheels being journaled eccentrically to allow of ready transfer from sliding to rolling friction, or *vice versa*.

For the purpose of automatically inclining the gun from its loading to firing position, and *vice versa*, there is pivoted on each side of the rear end of the lower carriage a slotted bar of desired curvature, the upper end of which is movable for the purpose of adjusting the gun in a vertical plane after it has been raised above the parapet, as shown in Fig. 4, or it may be set for elevation before the gun is raised into battery. The adjustment of the upper end of each of the slotted bars is accomplished by means of a pinion meshing in the teeth of a curved rack, forming a part of the upper end of each of the slotted bars, these pinions being secured to a shaft journaled in the upper end of the lower carriage and actuated by means of power applied to a crank. To each side of the rear end of the gun is pivoted loosely journaled on a transverse shaft, on which is also journaled a pair of rollers adapted to roll on the upper edges of the lower carriage during the depression of the gun. It is essential that the roller shaft should be connected to the upper carriage during the depression of the gun, and for this purpose the upper carriage is provided with one or more vertically yielding spring actuated clutches adapted when released to encompass the roller shaft during the recoil and depression of the gun, and to be automatically released from the shaft shortly before the upper carriage reaches its lowest position on the chassis, such release being accomplished by the lower end of the clutch coming in contact with a cam surface or incline on the lower carriage. During the upward motion of the carriage on the chassis and upward swinging motion of the latter on its pivot, the roller shaft remains in the rear end of the grooves until the chassis inclines slightly downward, when the shaft rolls forward in the grooves until it reaches its position, where it is ready to engage with the upper carriage in its elevated position ready for a discharge. When the chassis by the gravity of the gun is swung into position for discharge the clutches are automatically raised to allow the shaft and its rollers to come into the position above mentioned, and this is accomplished by means of a lever (for each clutch) pivoted to the lower carriage, the rear end of which lever is swung upward against the lower end of the clutch when a projection at the front end of the chassis comes in contact with the forward end of the pivoted lever, as shown in Fig. 4.

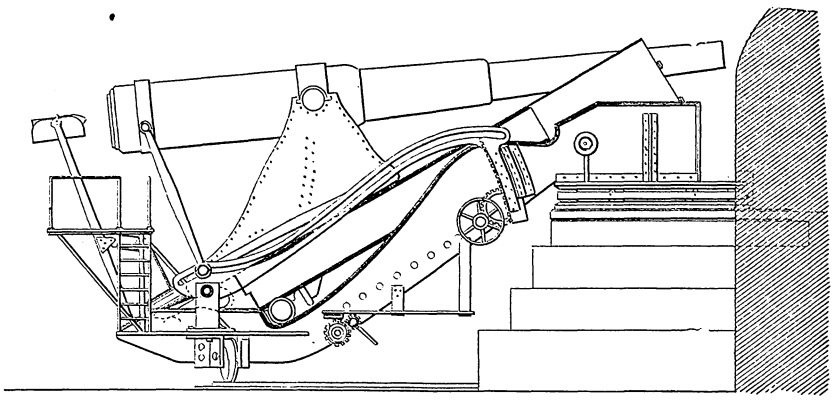


*Fig. 3.—Side Elevation of Gun in Depressed Position.*

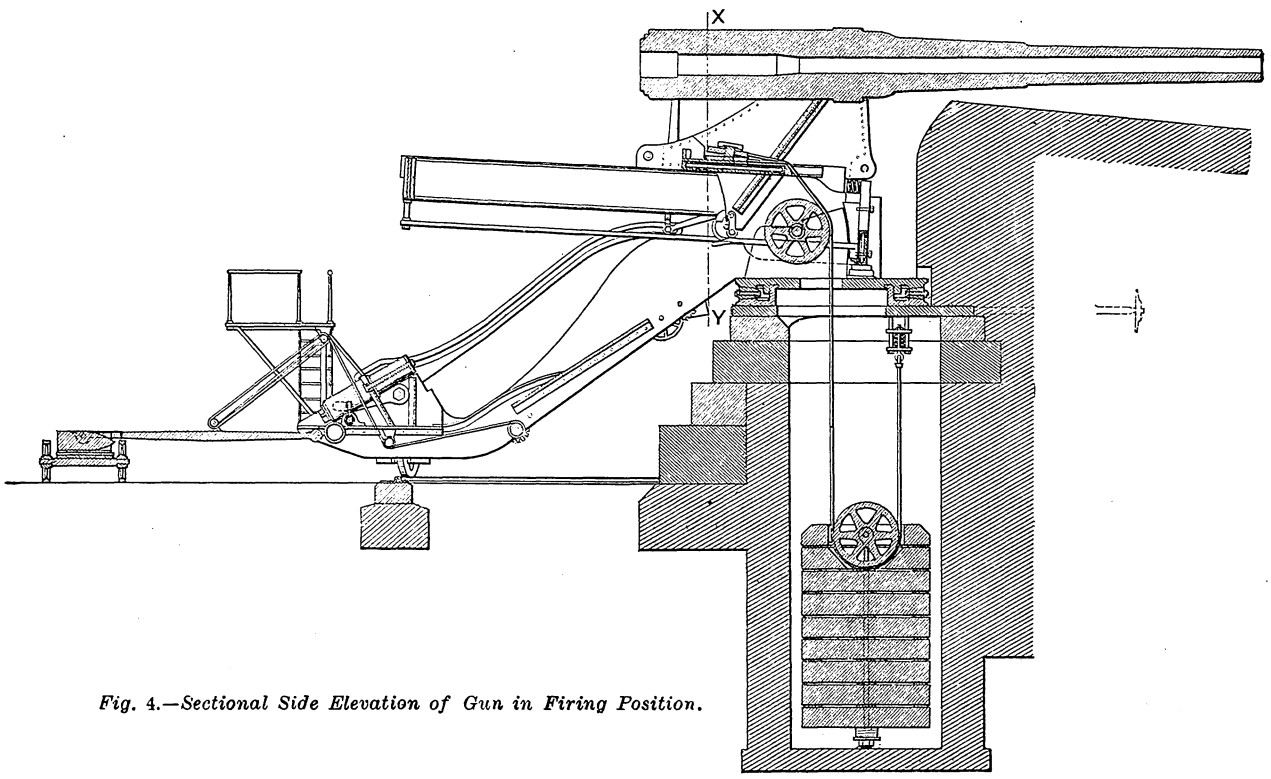



*Fig. 4.—Sectional Side Elevation of Gun in Firing Position.*

THE MANSFIELD DISAPPEARING GUN CARRIAGE.

a link, the lower end of which is guided in the slotted bar, and to the lower end of the link is pivoted a link, the forward end of which is pivoted to the upper carriage, as shown in the drawings. By this arrangement of links and grooved bar the gun is automatically guided from the position shown in Fig. 3 to the position shown in Fig. 4, and *vice versa*, during the raising or lowering of the gun to or from firing position.

Each chassis rail has on its under side a longitudinal groove formed by means of a rail secured at a suitable distance from the under side of such chassis, as shown in Figs 4 and 5. In these chassis grooves are located rollers

The operation of the system is as follows: Supposing the gun to be in the elevated position and ready for discharge, as represented in Fig. 4, the discharge of the gun causes its carriage to recoil on the chassis under sliding friction. The clutches on the upper carriage are automatically connected to the roller shaft the moment they pass beyond the rear end of the levers. The chassis commences to swing downward as soon as the center of gravity of the gun and its carriage has moved back of the pivot where the chassis is hinged to

the lower carriage, and during such downward swinging motion of the chassis the rollers on the shaft are caused to roll respectively against the under side of the chassis and top of the lower carriage, by which the downward sliding motion of the upper carriage on the chassis and the tipping motion of the latter on its fulcrum are properly constrained and retarded so as to check recoil and prevent a too rapid and dangerous descent of the gun to the depressed position. When the chassis reaches its lowest position its rear end comes to a stop against an abutment on the lower carriage. During the descent of the upper carriage as it approaches its lowest position on the chassis the weight of it and the gun will be overcome by the counterpoise, causing the upper carriage to be automatically moved upward and forward on the chassis, and as the center of gravity of the gun and its carriage comes in advance of the fulcrum the chassis will gradually assume the slightly forward tipped position shown in Fig. 4, and as it reaches such position the clutches are automatically raised by the projection and lever, allowing the shaft and its rollers to roll forward on the rails until the rollers on the shaft are brought to the forward end of the chassis grooves ready to engage with the upper carriage, as before stated. During such upward motion of the gun it is gradually inclined from the position shown in Fig. 3 to the one shown in Fig. 4 by the agency of the links and grooved bar, as stated.

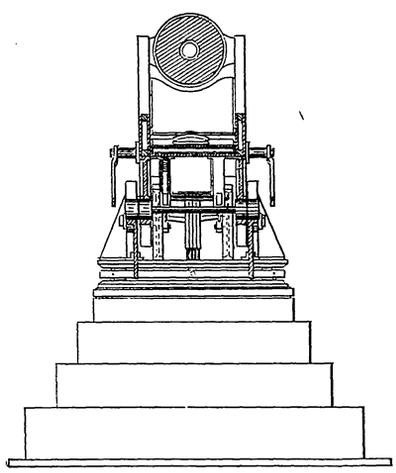


*Fig. 5.—Section on Line X Y of Fig. 4.*

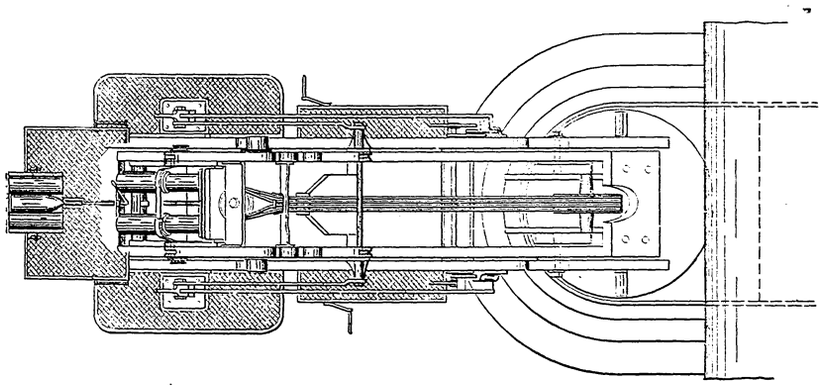


*Fig. 6.—Plan of Carriage with Gun Removed.*

THE MANSFIELD DISAPPEARING GUN CARRIAGE.

clutches are automatically released from the shaft by a cam or incline, and the carriage is brought against the buffer, causing the gun to come to its loading position without shock or jar. During the descent of the gun the counterpoise attached to the carriage is raised and its rope guided on the rotary wheel or pulley. The gun will remain in its depressed position by the frictional resistance between the carriage and upper portions of the chassis. During the descent of the gun it is automatically inclined from the position shown in Fig. 4 to the one shown in Fig. 3 by the pivoted links and grooved bar, as before mentioned. After loading the gun, when it is desired to raise it, it is only necessary to cause the upper carriage to rest with a rolling friction on the chassis, which is done simply by adjusting the eccentric rollers until they bear on the chassis, when the rolling friction of the carriage and of the drum, which blows the scale out of the boiler. The device is nearly completed and ready for trial.

F. E. Fitch of the Northern Central machine shops, Elmira, N. Y., is the inventor of a device called a circulator, which is attached to the boiler of a locomotive. It has long been a source of great trouble to engineers to have the scale caused by unclean water in the boiler cling to the flue pipes, and in time make what is called mud burn, which wears out the boiler. Engineer Fitch conceived the idea that circulating water would stop the scale deposits, and has arranged a set of 4-inch pipes which lead from the rear end of the boiler down through the fire box into a drum which is located about 4 feet in front of the fire box. The drum is 3 feet long and 1 foot in diameter. A blow off cock is located in the bottom

Governor Peck of Wisconsin is receiving donations at Milwaukee for the destitute iron ore miners of the Lake Superior region. Generous contributions of food, clothing and money have already been forwarded from Chicago, while the citizens of Wisconsin are making vigorous efforts to help the sufferers.

The demand for water works machinery is growing very much livelier. During the past two weeks bids were opened in New York for two 10,000,000 gallon and two 4,000,000 gallon engines, in Philadelphia for four 20,000,000 gallon engines and in St. Louis for two 30,000,000 gallon engines.

# Heavy Steel Forgings—II.*

## Their Production in the United States.

BY RUSSELL W. DAVENPORT, BETHLEHEM, PA

### Gun Forgings.

The high working strains to which modern heavy ordnance is subjected have called for the highest attainable qualities in the material of which the parts are made. To insure this end, the specifications governing the manufacture of gun forgings have been drawn with great care, a large number of test specimens, cut from the actual forgings after final treatment, are required to show uniform and high physical qualities, and the manufacture is subject to constant and thorough inspection. The result is that the steel for gun forgings is melted of the best obtainable material, ingots are cast with special care to avoid cracks, blow holes and other defects, hollow forging is practiced whenever possible, and tempering and annealing is universally applied. In short, all the resources of the steel maker's art have been called upon to insure a perfect product in which the highest attainable physical qualities have been developed. As steel gun forgings have up to the present time been in general made of simple steel, improvements in physical qualities to meet the demands of higher working pressures must be looked for in some steel alloy. Chrome has been used to a limited extent for parts of small dimensions where great hardness and high elastic limit are aimed at, as in the Brown segmental gun, but nickel offers the best promise of improvement in the physical qualities of gun forgings. A complete set of forgings for an 8-inch gun has been made by the Bethlehem Iron Company for the Bureau of Ordnance, U. S. Navy, of nickel steel and are now being assembled at the Washington Navy Yard. The average physical qualities obtained in these forgings in transverse specimens were:

| | Tensile strength. Pounds per square inch. | Elastic limit. Pounds per square inch. | Extension. Per cent. | Contraction of area. Per cent. |
|---|---|---|---|---|
| Tube.. | 93,200 | 58,300 | 21.2 | 42.0 |
| Jacket | 99,900 | 60,000 | 20.4 | 45.9 |
| Hoops. | 109,100 | 68,200 | 20.5 | 46.9 |

Size of specimen, 2¼ inches diameter and 2 inches long.

As compared with an average of qualities usually obtained in corresponding navy gun forgings, made of simple steel, the tensile strength shows an increase of about 10 per cent., and the elastic limit an increase of from 22 to 28 per cent.; the elongation and contraction of area are but slightly reduced.

It is believed that by modifying the composition of this steel a considerably higher tensile strength and elastic limit can be obtained without dangerous sacrifice in ductility.

The Ordnance Department of the Army have also ordered a tube for a 12-inch gun, model 1892, to be made of nickel steel. The physical qualities guaranteed in transverse specimens $\frac{9}{16}$ inch diameter and 3 inches long are as follows: Tensile strength, 85,000 pounds per square inch; elastic limit, 53,000 pounds per square inch; elongation, 18 per cent.; contraction of area,

* From a paper read at the first annual meeting of the Society of Naval Architects and Engineers.

35 per cent., which is an increase of 9 per cent. in tensile strength, 26 per cent. in elastic limit, 6 per cent. in extension and 17 per cent. in contraction of area over the usual minimum requirements.

It is thought probable that tubes of nickel steel may offer an increased resistance to erosion of bore as compared with simple steel, and it is hoped that more extended experiments will be made to determine this important point.

### Armor Plate.

The remarks made regarding the high standard aimed at in the manufacture of gun forgings are also applicable to that of steel armor plate. "The best is none too good," is a safe motto. Besides meeting certain physical requirements in specimens taken from the plates, the manufacturer has to guarantee a successful ballistic trial of any plate of a group which the inspector may choose to select; and as the financial loss in case of failure may be very great, it is evident that every possible care must be taken to perfect and control the manufacture. The ballistic acceptance test of armor plate for the United States Navy is more severe than that demanded in any other country.

Forged armor plates made of simple steel, as originally developed by the Creusot Works, offered a much greater resistance to penetration than wrought iron or even compound plates when attacked with steel armor piercing projectiles, but the vice of the all steel plate lies in cracking, and it was the introduction of nickel into the steel, as already stated, which to a great degree corrected this defect.

It is probable that an increased resistance to penetration may be obtained by the introduction of other metals along with nickel, and at the St. Chamond Works, in France, steel containing both nickel and chromium has given good results. Developments in this direction, however, have been somewhat checked by the advent of hard faced steel plates, by which it is aimed to stop and break up the steel projectiles before serious penetration takes place.

The introduction of carbon by cementation into the face of the plate with subsequent water hardening, as proposed by Harvey, and known as the "Harvey process," has, up to the present time, given the best results in this direction. The application of this process, which was developed at the Bethlehem Works, with the energetic aid of the Bureau of Ordnance of the United States Navy, has now passed its experimental stage for plates of medium thickness, and the Harveyized 12-inch taper plate representing the side armor of the "Maine" (recently tested at Indian Head), and manufactured by the Bethlehem Iron Company, gave highly satisfactory results, and is beyond doubt the most resisting "service" armor plate ever submitted to trial.

### Marine Shafting and Engine Forgings.

It may be said that in the manufacture of this class of heavy steel forgings it is not yet the usual practice to aim at the highest attainable combination of physical qualities, and that therefore there is a wider field for improvement in this direction than in the case of forgings for guns and armor plate.

From this statement it must not be inferred that the demands of the United States Navy specifications, which may now be taken as the standard in this country, are not such as to insure an excellent quality of steel; on the contrary, the conditions of inspection are rigorous, the amount of testing large, and the physical qualities demanded are such as can only be obtained by the use of high grade stock, by ample forging facilities and by careful manufacture throughout. The present physical requirements for shafting, including cranks, are: Tensile strength not less than 58,000 pounds per square inch, and an average elongation of not less than 28 per cent. in longitudinal specimens ½ inch diameter and 2 inches long, cut from full sized prolongations of forgings. For connecting and piston rods a somewhat harder steel, with a tensile strength of not less than 65,000 pounds per square inch and an elongation of not less than 25 per cent., is used. No treatment other than annealing is prescribed, and the elastic limit is not considered as a condition of acceptance. From these requirements it will be seen that a distinctly soft steel is being used, in which the elastic limit often falls to about 27,000 pounds per square inch, and averages something over 30,000 pounds. In adopting such soft steel, the practice of the English Admiralty and merchant marine has been followed, and in view of the fact that this practice is based upon wide experience and the use of a very large amount of material, much of which has done excellent service, it has been a wise and conservative course to make no hasty and radical departures from same.

It must indeed be conceded that soft steel presents in some respects marked advantages as the standard material for shafts and engine forgings, particularly when the manufacture is intrusted to forges having insufficient facilities and lack of experience in handling the harder classes of steel. In the ingot form and during forging soft steel can bear with safety rougher treatment than harder steels; it is less sensitive to the hurtful effects of irregular and repeated heatings, and dangerous internal strains and defects are less apt to be developed thereby; these are important considerations, especially in the case of forgings of irregular shape, such as solid forged cranks, connecting rods, &c. Further, by the use of soft steel the cost of machining, and hence the cost of finished forgings, is reduced to a minimum. It is natural, therefore, that marine engineers should hesitate to make a change in a matter of such importance, feeling, as they do, that in soft steel forgings there is an element of safety that cannot be overlooked.

In calculating the dimensions of marine engine forgings the elastic limit of the material used has not been as important a factor as in the designing of heavy guns. This is principally due to the larger factor of safety used in engine forging to insure stiffness or rigidity of parts under transverse strains. There is much evidence at hand, however, to indicate that the importance of a high elastic limit in steel forgings has not been sufficiently considered, and that many failures of soft steel forgings of excellent quality can be ascribed to a low elastic limit. A notable instance is that of locomotive crank pin forgings, where soft steel has in many cases failed by breakage as frequently as wrought iron, and where a harder steel with higher elastic limit has given far better results. The length of service of hammered piston rods has also been much increased by the use of steel of high elastic limit. These are instances of machine parts subjected to exceptionally severe working strains.

In the highest development of the modern marine engines reduction of weight of all parts is of prime importance. This can only be accomplished by reducing sectional areas. On the other hand, outside dimensions cannot be usually reduced without sacrificing necessary stiffness. We are, therefore, led to removing the metal along the neutral axes, or, in other words, to the use of hollow forgings. This practice has been followed in designing the shafting of all the ships of the new navy except the four Roach ships.

In most cases, however, the danger of too great a reduction of sectional area has evidently been feared, and the diameters of axial holes have been made too small to allow of advantageous hollow forging on a mandrel. Solid forging with subsequent boring has, therefore, been necessary, whereby a distinct loss in quality of metal has occurred.

It is evident that to reduce further relative weights as well as to increase the absolute strength of parts, the designer of marine engines needs a stronger material than that now employed; that is, a material having a greater elastic limit, but at the same time possessing such a degree of toughness as to insure resistance to sudden strain or shock. Such a material can be found in steel harder than that now used, strengthened and toughened by tempering and annealing. Simple steel of the proper natural hardness, and so treated, will show in specimens cut from the center of sections, say 3 to 6 inches thick, an elastic limit of about 45,000 pounds per square inch, an elongation of about 23 per cent. in 2 inches and a contraction of area of from 50 to 55 per cent. To allow of safe and effective tempering forgings must be made hollow wherever possible, rectangular sections reduced in thickness as far as practicable, large fillets used, and sharp re-entering angles and sudden changes from thin to thick sections avoided. In shafting, axial holes should be made large enough wherever practicable to allow of hollow forging, and additional strength with the same weight obtained by increasing both outside and inside diameters and thus reducing thickness of walls.

A further and very pronounced improvement in strength and toughness can be obtained, as already indicated, by the use of nickel steel, tempered and annealed and prepared for treatment as above described. The use of nickel allows a reduction of carbon, makes the steel more sensitive to temper, and facilitates the tempering of irregular shapes. Specimens from nickel steel forgings, tempered and annealed, will show uniformly an elastic limit of from 50,000 to 55,000 pounds per square inch, an elongation of 23 per cent. and above, in specimens 2 inches long and 1½ inches in diameter, and a contraction of area of from 55 to 60 per cent. In cases where, owing to thickness of section and irregular shape, tempering is not advisable, nickel steel will still show a higher combination of elasticity and toughness than any other material known under the same conditions.

Here, then, is a material admirably suited to the shafting and engine forgings required by the marine engineer in the construction of modern high service engines, and it is believed that as its merits become known its use will be widely extended.

The Bureau of Steam Engineering has already taken this material into consideration, and in designing the shafting

of the "Brooklyn" and "Iowa," it was decided to make the two propeller shafts of the former and the two intermediate line shafts of the latter ship of nickel steel. The diameters of the "Brooklyn's" propeller shafts will be 17 inches outside and 11 inches inside, giving walls 3 inches thick, while the line shafts of the "Iowa" will be 15¾ inches outside diameter and 9¾ inches inside diameter, with walls also 3 inches thick.

The specifications prescribe that these shafts shall be oil tempered, and demand a tensile strength of not less than 85,000 pounds per square inch, an elastic limit of not less than 50,000 pounds, an average elongation of 23 per cent. in specimens 2 inches long and ½ inch in diameter (no specimen to fall below 20 per cent.).

A comparison of the strength of these shafts within their elastic limit with that of solid shafts of same sectional area made of soft, simple steel, having an elastic limit of 30,000 pounds per square inch, and also a comparison of their weights per linear unit with that of soft steel solid shafts of equal strength may be of interest. The following table gives the results of calculations made by Prof. Mansfield Merriman of the Lehigh University:

| Comparison of three steel shafts. Case I. | Propeller shaft United States steamship "Brooklyn." Hollow. Outside diameter 17 inches, inside diameter 11 inches. Nickel steel. E. L. 50,000 pounds per square inch. | Solid shaft, same (approximate) sectional area. Diameter 13 inches. Simple steel. E. L. 30,000 pounds per square inch. | Solid shaft of same strength under applied loads, or horse-power. Diameter 18.9 inches. Simple steel. E. L. 30,000 pounds per square inch. |
|---|---|---|---|
| Areas of sections, square inches | 131.95 | 132.73 | 280 55 |
| Weights per yard, pounds | 1,346 | 1,354 | 2,861 |
| Comparative strengths under applied loads in flexure, or under applied horse-power in torsion | 307 | 100 | 307 |
| Load, in pounds, at middle of a span of 12 feet on two supports, which strains to one-half elastic limit | 276,200 | 89,900 | 276,200 |
| Length of beam on two supports, which is strained by its own weight to one-half elastic limits, feet | 121.6 | 77.6 | 83.4 |
| Horse-power transmitted at 50 revolutions per minute when strained to one-half elastic limits | 15,780 | 5,130 | 15,780 |

| Comparison of three steel shafts. Case II. | Intermediate line shaft United States steamship "Iowa." Hollow. Outside diameter 15¾ inches, inside diameter 9¾ inches. Nickel steel. E. L. 50,000 pounds per square inch. | Solid shaft, same (approximate) sectional area. Diameter 12⅜ inches. Simple steel. E. L. 30,000 pounds per square inch. | Solid shaft of same strength under applied loads or horse-power. Diameter 17.71 inches. Simple steel. E. L. 30,000 pounds per square inch. |
|---|---|---|---|
| Areas of sections, square inches | 120.17 | 120 28 | 246.34 |
| Weights per yard, pounds | 1,225 | 1,227 | 2,513 |
| Comparative strengths under applied loads in flexure, or under applied horse-power in torsion | 293 | 100 | 293 |
| Load which, at middle of a beam 12 feet in span on two supports, causes strains equal to one-half elastic limit, pounds | 227,200 | 77,500 | 227,200 |
| Length of beam on two supports which is strained by its own weight to one-half elastic limits, feet | 115.6 | 75.9 | 80.8 |
| Horse-powers transmitted at 50 revolutions per minute when strained to one-half elastic limits | 12,980 | 4,430 | 12,980 |

From the above it will be seen that by the use of the hollow shafts made of the stronger steel there is again in strength of three to one and a reduction in weight of more than one-half as compared with solid steel shafts of equal weight and equal strength respectively.

It must be borne in mind that this gain in strength and reduction of weight are not obtained at a dangerous sacrifice of toughness, for the stronger tempered steel is also extremely tough, as shown by cold bending and by the extension and the contraction of area of tensile specimens.

It will be readily admitted that such gains cannot be overlooked by the marine engineers and that there is here a wide field open for improvement in marine engine forgings.

## The Morewood Company's Tin Plate Works.

The Morewood Company are now getting in shape their new tin plate works at Gas City, Ind. For some time they have been running the coating department, but results have not been satisfactory, owing to frequent delays in receiving supplies of black plates, some of which have been purchased from American makers and some imported from Wales. Meantime the erection of rolling mills has been pushed, and these will shortly be in operation, after which there will be no interruption to the company's business for lack of essential materials.

The establishment of this plant at Gas City is wholly due to the enterprise of the president of the company, J. H. Rogers, one of the foremost manufacturers of tin plate in Wales, operating two large works. For some years Mr. Rogers had foreseen that the United States would eventually engage in the manufacture of tin plate, and contemplated making a venture on his own account. Some two years since this idea developed into a determination, and he visited this country to survey the field with that object in view. Early in 1892 he decided to locate at Gas City, but in the meantime put up temporary coating works at Elizabethport, N. J., which are now being removed to Gas City. Contracts for the building and much of the machinery were let in the spring and summer of 1892, but ground was not broken for the foundations until October. Since then work has been pushed as rapidly as consistent with the erection of a good plant on a thoroughly substantial basis. The buildings which have been erected are all strictly fire proof, having steel frames and metal roofs and sides. They are equipped with the best machinery adapted to the manufacture of tin plate, among which are found numerous special machines devised by Mr. Rogers for the rapid and easy handling of materials.

At present seven tinning stacks are in operation, but within a month three more will be at work. Of these there are three that exclusively run on ternes, while the others can vary from bright to ternes, according to the requirements of the trade. The pots used are not new, being principally of the kind invented by Mr. Rogers' father. This is a point upon which Mr. Rogers has expended much thought and investigation. He has decided that instead of seeking rapidity and cheapness in coating, at the sacrifice of quality, he will manufacture after the old style of soaking instead of merely painting the plate with a thin coat of tin in one passage through rolls. By this method say 40 sheets are placed in the tin bath at a time, then removed and the oxide of tin wiped off, after which they are dipped again and run through rolls in palm oil. This insures a perfect union of the tin with the steel sheet and makes a more durable plate. For months Mr. Rogers visited meat and fruit packers and other tin plate consumers, getting their criticisms of the ordinary plates and finding out what was demanded. The personal contact with the consumer convinced him that tin plate makers were altogether on the wrong track in trying to make their plates as cheaply as possible. Hence his decision with regard to the method of coating. He believes that this will obviate the long-standing complaint of pin holing.

In the pickling, annealing and rolling departments old methods are, however, dropped as much as possible. Here every effort is made to economize labor and insure rapidity of operation. Pickling vats are filled, agitated and emptied by ingenious machinery. Annealing furnaces are operated by a mechanical charger. The rolls are arranged on a plan not hitherto known in this country. There are four cold rolling mills in which the trains are set in parallel rolls run by gearing from a common engine. In other works the practice is to set the rolls in a straight line. There are numerous reasons advanced by the Morewood Company in favor of their method, in which they follow the latest and most improved practice in the best Welsh mills. The hot rolling mills now in course of construction will at first comprise four mills, but it is expected that four more will be added between now and next summer. For the present tin plate slabs will be purchased, but it is the intention of the company to erect steel works at an early day to make their own steel, and thus control the quality of their material as far as possible.

The brands adopted by the company thus far are as follows: F. W. B. This is the heaviest possible coated roofing plate. J. H. R. is the next grade of terne plate, and is of Worcester grade. H. C. B. is the Lille grade of terne. P. T. L. is a bright terne, and is the grade with which the exposition buildings in Philadelphia in 1876 were roofed. R. H. J. is a bright plate intended for the use of canners of meat, fish, fruit, &c., and will be made as near perfection as possible.

These statements are subject to some qualification, in view of possible action upon the tariff question. Mr. Rogers states that, from his knowledge of wages on both sides of the Atlantic, any serious reduction in the tin plate duty must be met by heavy reductions in the wages paid here or the manufacture of tin plate will have to be abandoned. Even with wages reduced to some extent during the prevailing depression, the labor cost in the rolling department is treble the cost in Wales, and in the finishing department it is double. If the duty is not disturbed it is the intention of the company to push extensions of the plant steadily forward until it becomes the largest in the world. In the arrangement of their buildings this has been kept in view, and plenty of room has been kept for that purpose. The inclosure comprises over 50 acres. It is in one of the best gas districts in Indiana, where the pressure is constant at nearly 300 pounds. Railroad connections are afforded by the Panhandle branch of the Pennsylvania system.

# Modern Fixed Ammunition*

BY HAROLD THOMAS ASHTON.

(*Concluded from page* 851, *November* 9.)

### Completing Operations.

The head is turned by a cutting tool, which is brought against it while the case is rotating at a high speed in a tightly fitting coned chuck, into which it has been fed by the usual combination of slides and spring fingers, or by hand. The distinguishing marks are stamped on the base by steel dies, under which the cases are brought by a revolving table. The fire hole is pierced at two operations, the first consisting in merely making a center mark, through which the hole is punched in the second operation. The machines for each are similar, the cases being fed by hand into a revolving table which carries them opposite the tools. The cases are cleaned by dipping them into an acid solution, and, after they have been washed, placing a number of them at a time with hard sawdust in a revolving drum. The cap chamber is rectified by the insertion of a plug made of the exact size required, serving to correct any distortion of the chamber due to the operation of tapering the case. The mouth of the case is finally reamed to give it the exact length required, and, by beveling the edges internally, to facilitate the insertion of the bullet when the case is loaded. This is done by feeding the case into a coned bush, in which it is moved up against rapidly revolving cutters.

### Necking.

The cases are then examined and gauged, but though the reduction of the mouth of the case to the bottle necked shape, Fig. 13, is not conducted in the small case under consideration until after it has been charged, it may be most conveniently described here. In the larger cartridge case, where the mouth is not rendered inconveniently small for the insertion of the charge by the process, the neck is formed before loading, and the case leaves the factory in its finished form; while in some types, such as the 1-inch Nordenfeldt machine gun and the revolver pistol ammunition, necking is not required. The method of operation is an extension of that used for coning the case. For this purpose the case is supported on its base, and a die brought down upon its mouth reduces it in diameter, and forms the straight cylindrical part and the shoulder. As under this treatment the metal does not thicken appreciably at the mouth, but obtains relief by extending slightly in length, a considerable strain is thrown on the portion of the case immediately below the shoulder, which, if too soft, bulges or buckles. Another defect occurring at this time if the metal is unequally distributed around the mouth, either as regards quality or quantity, is the formation of a crease or fold longitudinally in the straight part of the neck.

### Final Examination.

The examination of the finished cases is most severe. No case with the smallest scar, scratch or blemish in the shape of scaly or doubtful metal is allowed to pass, unless it is found on a second examination to be less defective than certain defined standards. The dimensions at every portion of the case are also tried by gauges made to the upper and lower limits of size allowed. The difference between the two is so small that the gauges require considerable care to prevent their wear becoming a serious source of error in passing the work. Thus, in the diameter of the cap chamber, the difference between the high and low gauges is only 0.001 inch, and an expert examiner will go through 7000 cases in an ordinary working day, the examination of each one wearing the gauge slightly. In the other dimensions somewhat more play is allowed, to the extent of 0.003 inch in the diameter of the body, 0.006 inch in the thickness of the head, 0.010 inch in the depth of the cap chamber, 0.020 inch in diameter of head, and 0.015 inch in total length. All the gauging has beeen done till recently by hand, but machines have been in use in Germany for some time which, it is stated, do the work as well or better than the inspectors they replace. They have been tried in the Royal Laboratory, but have not been found entirely satisfactory. With a view to obtain uniformity in the metal of the case, the weight is also laid down as 164–5 grains.

### General.

To insure this high degree of exactitude in the product of so many operations, it is necessary that each one should do its share of the work of manufacture with equal precision. In order that this may be done the same standard of accuracy must be maintained in the various stamping, drawing and cutting tools. As these are exposed to considerable wear in the performance of their work it is necessary to make them of the extreme limits of size allowable, and extremely hard, so that they may work for as long a time as possible before wearing to a size which causes them to produce work that would be rejected by the gauges. Also, as apart from accidents, the only stoppages in the running of the machines are those made to allow the tools to be changed, it follows that not only the quality, but also the quantity of the work done by any manufacturing plant is dependent on the excellence attained in the tools. These may be classified as punches, dies and cutting tools. With the cutting tools no great difficulties are experienced, as they can be made small in size and easy to harden, while the cartridge metal cuts freely, and so does not wear them seriously. The punches and bolsters are required to be as hard as possible, consistent with the possession of sufficient toughness to allow them to withstand considerable shocks and to yield slightly to work which has not left the previous operation absolutely correct. The dies for extending, coning, &c., should be somewhat harder than the punches, as they have more surface wear to resist; they must not readily score or chip at the edges, and must not split.

In making these tools, the actual shaping presents nothing more than accurate machine work finished to gauge, but in hardening them considerable skill is needed. Methods of hardening steel tools are very numerous, but the greater their simplicity and uniformity the better are the results obtained. Of the means specially adapted for cartridge case manufacture the following have been found most servicable: A small gas furnace is convenient for heating the tools, as it is clear and the temperature can be easily watched and regulated. For dies requiring a specially hard surface, an application of potash while the die is hot gives excellent results; and for many of the tools sulphuric acid as a cooling agent gives better results than water, which is, however, more generally useful. It is not well to be continually experimenting with either the steel or the methods of hardening, nor, if the usual methods or temperatures used prove unsatisfactory, is it wise to change them at once. Sometimes steel which has turned out badly at one time has been laid aside for weeks or months, and has then, when treated apparently in precisely the same manner, worked well, owing to some changes in the condition of the steel or of its surroundings. Changes of atmospheric temperature have a most marked effect on the hardened tools, so much so that those left in the machines from Saturday to Monday in frosty weather, or even over night if the temperature of the factory falls considerably, rarely last beyond a very short time after the work has been resumed, the punches breaking off short, and the dies bursting and cracking. With these, as with all other hardened steel articles, an interval between the time of hardening and the time of using adds to their stability.

In manufacturing the smaller sizes of solid drawn cartridge cases the use of hardened steel for all tools is obligatory; but for the larger varieties, where the masses of metal in the tools are large and the stresses upon them less concentrated, cast iron and unhardened steel may be used occasionally. Strong cast iron has been found particularly economical for use in the coning dies for the quick firing cases; it is cheaper than and has not the same tendency to score the cases as unhardened steel, while in hardening steel dies of the size required there is great loss owing to cracks and deformations. For large drawing punches chilled cast iron is used with success, and for the large drawing dies a high carbon steel, un-

* From the proceedings of the Institution of Civil Engineers.

hardened, is found most suitable. Some other variations from the course pursued in making the smaller cases are also noticeable in the manufacture of the large cartridge cases for quick firing guns.

As the cases increase in size they are made in tens instead of in thousands, and are fed into the comparatively slow running machines more often by hand and less by automatic gear. The machines employed are entirely different. The drawing machines have heavy saddles in which the dies are placed, traversed slowly to and fro in their frames horizontally by screws or racks like planing machine tables. The punches are fixed on both sides of a central stationary yoke, up to which the dies are moved alternately, work being done first on one side and then on the other, the traverse of the machine in each direction being utilized to effect different operations. The trimming machines develop into specially designed lathes with chucks, into which the cases are fitted by hand. The heading machines are large hydraulic presses which upset the heads of the cases under a pressure measured in hundreds of tons, or their place is taken by steam hammers in which a number of blows are substituted for one squeeze. Also in the large cartridge cases the primer occupies a smaller proportion of the area of the base than is required in the smaller ones and the hole for it is usually bored out of the solid metal.

One question enters into the construction of the machinery for the manufacture of all cases, particularly of the smaller kinds, which has not been touched upon and is of some interest. This is whether it is advisable to make machines so that the attendant merely feeds the cases into a slide or revolving table, and leaves the rest to the machine; or whether, as is possible in many of the lighter operations, such as trimming, the cases should be brought to the tools entirely at the will of the operator and at a speed dependent on his skill, enabling him at his best to exceed somewhat the speed of working of an automatic machine. The non-automatic machine is simpler, and is consequently less liable to stoppages due to accidents, but the automatic machine has the advantage of running more steadily when at work. The solution of the question depends chiefly on the human element involved, and, although there are exceptions, it appears generally best to place as much reliance on the machines and as little on the attendant as possible.

Here it may be well to consider the behavior of the case when set to do the work for which it was made. Defects which are not evident till the case fails in firing are for the most part due to the bad quality of the metal of which it has been manufactured; but some faults are due to methods of manufacture. Of these the most serious are the complete or the partial separation of the base from the body, owing to internal folding of the metal where the walls of the case spring from the base, arising from incorrect shaping of the punches used in the later drawing operations, and escapes of gas around the primer in consequence of imperfect consolidation of the metal of the head. Splits at the mouth must either be due to bad metal or to imperfect annealing having left it hard and inelastic. On the other hand, the metal may err by being too soft, making it difficult to extract the case after firing, owing to the head and body having expanded permanently. Splits and bursts may also occur anywhere owing to defective metal. A good case may be fired several times, if ordinary gunpowder forms the charge, provided the residue from the explosion is promptly cleaned away, as otherwise the metal deteriorates. If, however, the charge is composed of any of the smokeless explosives based on the nitro-compounds, although the pressure to which the case is exposed may be lower, the intense heat accompanying the explosion appears to render the thin metal rotten and untrustworthy for future use. In the stronger quick firing cases these evil results are not so marked, as the metal is thicker and has a greater factor of safety.

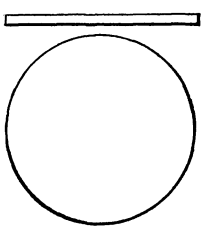


*Fig. 14.—Blank.*

*Fig. 26.—Formation of Cap.*

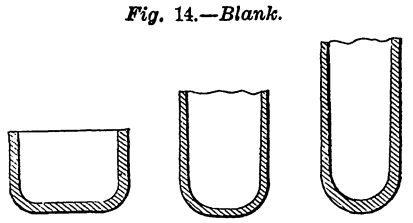


*Fig. 15. Cup.* *Fig. 16. 1st Draw.* *Fig. 17. 2d Draw.*

*Fig. 27.—Formation of Anvil.*

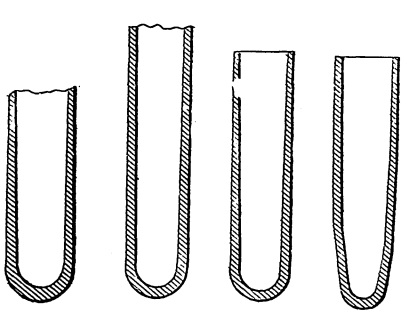


*Fig. 18. 3d Draw.* *Fig. 19. 4th Draw.* *Fig. 20. Trim.* *Fig. 21. Formed.*

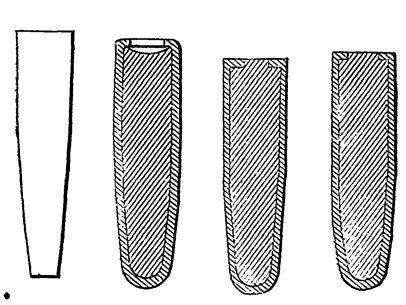


*Fig. 22. Core.* *Fig. 23. 1st Pressing.* *Fig. 24. 2d Pressing.* *Fig. 25. Rectified.*

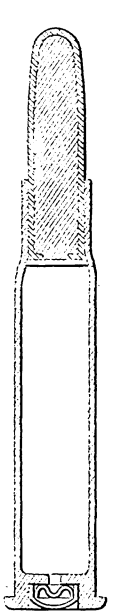


*Fig. 28.*

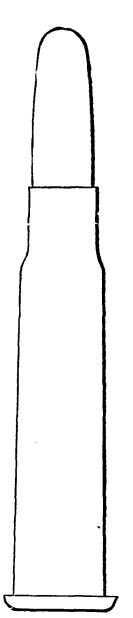


*Fig. 29.*

MODERN FIXED AMMUNITION.

### Means of Ignition.

The method of ignition, although not particularly affecting the active efficiency of the cartridge, provided that the ignition is uniformly and readily obtained, has an important bearing upon the safety of the ammunition during transit and use. A central firing percussion cap is now always used in small-arm ammunition and in the smaller varieties of quick firing cartridges. It consists of a cup of brass, or of an alloy of copper with a small percentage of lead, having cylindrical sides, with a layer of detonating composition pressed into the crown. This cup is tightly fitted mouth forward into the chamber prepared for it in the base of the cartridge case, in the center of which, either separate and inserted with the cap or formed as part of the case by raising a conical projection in the center of the chamber, is the anvil. When the cap is struck centrally the crown gives way and the detonating composition, crushed between the crown of the cap and the anvil, detonates and fires the charge by the flash it transmits around the anvil and through the hole or holes pierced for the purpose in the base of the cap chamber. The pressure caused by the explosion expands the cap tightly in its chamber and prevents all escape of gas around its edges, while the cap is prevented from being blown out by the friction between its walls and that of the chamber into which it has been forced. The

sensitiveness of the cap can be regulated by varying the material used for the detonating composition or the thickness of the crown. In the larger sizes of fixed ammunition an electrical primer is usually screwed in the base of the cartridge case so as to be removable at pleasure. An insulated contact piece and the body of the primer are connected by a fine wire bridge, which, when heated after the completion of the electrical circuit, fires the priming surrounding it, which in turn ignites the main charge. Escape of gas through or around the primer is prevented by packing or gas checks.

### The Projectile

The remaining component of the cartridge to be considered is the projectile. This, the actual agent of the work to be done by the ammunition, has as many forms as there are classes of targets to be attacked, and their detailed consideration would form a wide subject of inquiry. As, however, only a relatively small quantity of shot and shell are made up in fixed ammunition, for which the great majority of projectiles are merely what may be classed as bullets, it is proposed to consider these only; and as with the cases so with the projectiles, those for the new small bore rifle appear the most worthy of detailed consideration, as they are made in the largest quantities and present the most interesting features in manufacture. A principal object in the design of any projectile is that its powers of penetration on reaching the target should be sufficient to do the work required of it. The material and the striking velocity of the projectile are the chief factors in this equation. It is necessary that the larger projectiles used against all varieties of defenses and objects should be made of some of the hardest materials available, but this is not so with the bullets whose employment is principally against men. For these lead is universally adopted as the main element of their composition, owing to its great density and the consequent advantage obtained during its flight through the air and to its adaptability to the most convenient methods used to impart rotation, the disadvantage attending its comparative softness being overcome by the addition of a percentage of antimony or tin or a thin casing of some harder metal. The exact form of a projectile is comparatively unimportant. An ogival head or that approximation to it most suitable to the material of which it is made, gives the best results, the accuracy with which the target can be hit depending chiefly on the maintenance of certain relations between the velocity, speed of rotation and proportions of the projectile and on their individual uniformity. This in its turn, provided regularity has been obtained in the explosive charge, is dependent upon the completeness with which the projectile follows the direction of the rifling and fills the barrel from which it is fired and on the uniformity of the resistance therein encountered. A number of methods of arranging the projectile to take the rifling have been used. It has been made a mechanical fit, as in the Whitworth system, or partially so, as in the studded shot used in many muzzle loading guns, or the force of the explosion has been used to drive into the grooves of the rifling a cup, band or coating of soft metal fixed to the projectile. In breech loading small arms, however, the method almost invariably used has been to make the bullet sufficiently yielding to entirely fill the bore through which it has to pass on being driven forward by the explosion of the charge in spite of its irregular shape. No great difficulty was met with for a long time in the use of this system with a lead or lead alloy bullet, but as the muzzle velocities obtained from small bore rifles were raised and the calibers were diminished metallic fouling in the rifling at once increased in quantity, and became more objectionable. In rifles of a caliber as small as 0.4 inch, with a muzzle velocity of upward of 1500 feet per second, the difficulty was met by means of copious lubrication from a beeswax wad behind the bullet and by covering the rear cylindrical part of the bullet with fine paper. The bullet was made of an alloy of lead and tin. But in more modern rifles in which the caliber has been reduced to about 0.3 inch, and even less, and the muzzle velocity has been raised to 2000 feet per second, the difficulties due to fouling have been overcome by using a compound bullet consisting of a lead core pressed into a thin envelope or casing of suitable hard alloy, which, while its use is free from the worst difficulties in the barrel, possesses considerably greater penetration than a bullet of the same size formed of an alloy rich in lead. This bullet is shown in Fig. 25. The opening through which the lead core is inserted is at the rear of the envelope, which is thicker at the nose than elsewhere, and the attachment between the two is completed by turning over the rear edges of the envelope.

Major Rubini, the inventor of the compound bullet, is reported to have successfully used a modification of it consisting of a lead alloy bullet tipped with a steel cap to increase its penetrative power, and covered over its main diameter with specially prepared paper; but experiments in England on these lines have not given good results. Many materials, including almost all ductile alloys and plated iron and steel, have been experimented upon with a view to their use for the manufacture of bullet envelopes; but nothing has been found more suitable than an alloy of copper and nickel in the proportions of about 20 per cent. nickel and 80 per cent. copper, with small quantities of manganese, iron and silicon. This alloy is tough, hard and white, capable of taking a fine polish, only slightly affected by the atmosphere, and giving in rolled sheets a tensile strength of 27 tons per square inch, with an elongation of 25 per cent. in 5 inches.

### Preparation of Envelope.

The successful manufacture of this alloy requires the greatest care, extremely small deviation from the established course producing disastrous results. There is at the outset some difficulty in obtaining supplies of nickel of uniform quality, apparently due to the variations in the amount and manner of its reduction from the nickel oxide. The nickel and copper cannot be satisfactorily cast and worked by themselves, and the small percentage of other elements present in the alloy are introduced on this account. The particular methods of their introduction are regarded by some of the manufacturers who use them successfully as trade secrets, but the best effects have been obtained in the Royal Laboratory by the addition to the copper and nickel of a small amount of silico-spiegel, originally obtained for use in steel manufacture. Other physic, including varying quantities of ferromanganese, iron, zinc, aluminum and phosphorus, have been tried with varying results, some of the metal produced having worked well during manufacture, but failed completely in the final and severest test of firing, while some of it has been entirely satisfactory.

The alloy is cast in chills in the same manner as the metal used for cartridge cases, and is rolled down similarly, although it is not possible to do so much work upon it at each passage through the rolls without injuring it. The thickness to which the cupro-nickel strip is finally reduced is 0.04 inch, and this, after being annealed, cleaned and trimmed to a suitable width, is passed to cupping machines similar to those used in the first operation in the case manufacture, which at once punch out the blanks and form them up into the cups, Fig. 15, from which the envelopes are gradually formed. The cups having been annealed, are passed to drawing machines, which also are similar in design and action to those used for case manufacture. These extend the envelope and thin its walls to the required extent in four operations, which are accompanied by two trimming operations, in which the ragged edge at the mouth of the partially formed envelope is cut off, before and after it is drawn for the fourth time. It is not found necessary to anneal the cupro-nickel after every drawing operation, as is the case in dealing with the brass used for the cartridge cases. Indeed, it is the practice of some manufacturers not to anneal the cupro nickel after any operation subsequent to the formation of the cup. In the Royal Laboratory, however, the metal is found to give the best results if annealed after the fourth drawing operation.

In order to make the envelope with the rounded nose required, the drawing punches are approximate in shape to the final internal form. They cannot be made exactly of this form without being liable to punch out the front of the cups when descending upon them to force them through the drawing dies. Consequently the envelopes leave the drawing and trimming operations as hollow cylinders open at one end and closed by a dome at the other end, the interior cavity being slightly tapered, as shown in Fig. 20. In order to bring them to their finished proportions they are passed to the point forming machines, in which a punch, made exactly of the internal size of the finished envelope, presses them home into a die the exact size of the finished bullet. This tries the metal severely, for, although if good it receives no injury, weak or brittle metal gives way round the punch, which passes through the front of the would be envelope and at once destroys it. After being formed the envelope is completed by having its mouth reamered, and being trimmed to length.

### Preparation of Lead Cores.

The lead cores now inserted by hand into the envelopes are made of an alloy of lead with 2 per cent. of antimony. This alloy is squirted into a rod by hydraulic pressure, for which purpose it is cast into a cylindrical chamber in the head of a hydraulic press, which is raised immediately the metal has set. Directly above the cylindrical cavity, and entering it when the ram is raised, is a fixed piston in whose center is placed a hardened steel die, with a central hole through which the semi-plastic metal is squirted as the ram continues to rise. It is curious that the die through which the lead is forced continues to grow smaller for some time

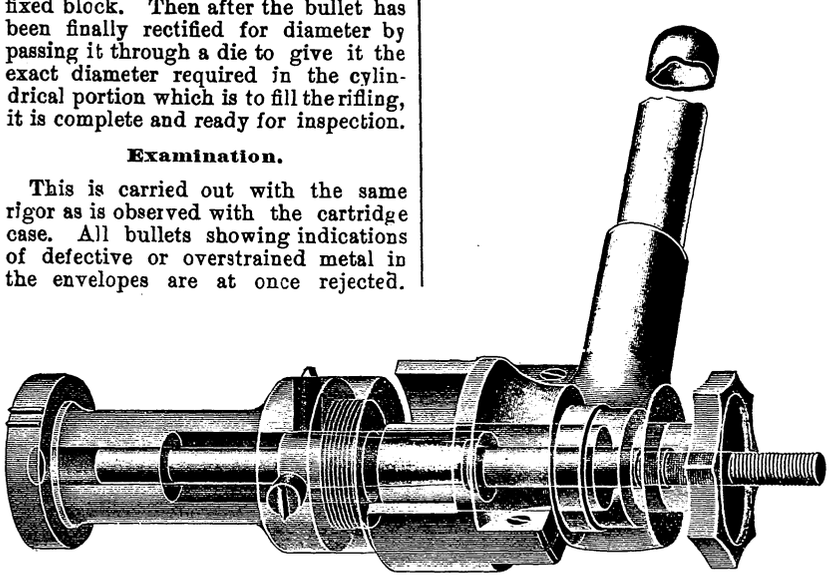
after it is first put in, instead of wearing larger, as would naturally be expected. This is due to the high temperature of the lead taking the temper out of the steel, and causing the die to shrink at a greater rate than is compensated for by the wear due to the passage of the lead. To make the cores the lead rod is passed to machines which cut it into short lengths, which are formed to the required shape by pressure in a die or mold.

**Assembling, &c.**

After the cores have been placed in the envelopes by hand they are pressed home so as to fill them completely. The envelope is held for the time in a die of the size of the finished bullet, and the tool that presses in the core turns in the rear edges of the envelope slightly in readiness for the next operation, which consists in pressing these edges firmly down on the core and consolidat the whole bullet. After this a cannelure or groove to contain lubricant is formed near its base by rolling it between a suitably shaped revolving disk and a fixed block. Then after the bullet has been finally rectified for diameter by passing it through a die to give it the exact diameter required in the cylindrical portion which is to fill the rifling, it is complete and ready for inspection.

**Examination.**

This is carried out with the same rigor as is observed with the cartridge case. All bullets showing indications of defective or overstrained metal in the envelopes are at once rejected.



THE LE VASSEUR BOILER TUBE CUTTER.

Two-thousandths of an inch are allowed between the high and low diameters of the bullets, but more latitude—viz, 0.032 inch—is allowed in its length. Large numbers of bullets are fired into water or sawdust, and are afterward examined to ascertain whether the envelope has held well together, and neither cracked along the marks made by the rifling nor been torn away at the rear. The weight is an important point, and is allowed to vary between 215 + or — 3 grains. Of this the envelope weighs 57 to from 60 grains.

The machines used in the manufacture of the compound bullet are all made on lines similar to those used for making the cartridge cases; in all, the envelopes or bullets are fed into tables or slides by hand and delivered to the operating tools by mechanical means. Also in the manufacture of the envelope, in which the chief difficulties in making the compound bullet lie, success depends as much on the quality of the tools used as in the manufacture of the solid drawn case, and the qualifications required in them are the same. The cupro-nickel is, however, both harder and stronger than the brass, and consequently wears the tools more rapidly, and causes them to scratch more easily.

As with the case so with the projectiles, more latitude is given in respect of weight, dimensions, quality of material and defects in manufacture in the larger sizes of small arm or quick firing ammunition; but the inspection of all varieties is extremely stringent.

**Assembling the Cartridge.**

In assembling the several components to form the complete cartridge, the object chiefly sought, after the production of perfectly sound ammunition, is safety while the work is being performed. This is attained by a system of carefully inspected danger buildings in which numerous precautions are taken, and from which all men and materials not actually required are excluded.

The operations here performed being similar for all kinds of ammunition, need only be particularly referred to as applied to the small arm class, the manufacture of bullets and cases for which has already been described. First, the cap, after having been primed, is inserted in the case, and firmly pressed home into the chamber prepared for it. Then after the insertion of the charge the case is bottle necked in the manner described. The internal diameter of the neck is made such as to just admit the bullet, the base of which has previously been coated over with beeswax, and is inserted in the case over wads—the beeswax doing double duty as lubricant for the bullet and water tight packing between the latter and the case. The neck of the case is then finally pinched on to the bullet and indented for cordite and cannelure, when the cartridge is complete. The examination and gauging which follows is chiefly designed for the detection of faults due to the manner of assembling, but also acts as a check on the previous examinations of the components of the cartridge. Every cartridge is tried in a socket gauge, smaller than the chamber in which it is intended that it should be fired, and most of the external dimensions of the cartridge are also gauged separately. The bundles of cartridges, as made up for service, are all weighed to make certain that no cartridge has found its way through the factories with any hidden part missing, such as the whole or portion of the charge or core of the bullet. Proofs are fired for velocity and accuracy, any defects developed in bullets or cases being noticed at the same time, while separate firing proofs specially for the detection of such defects may also be taken.

The accuracy of the shooting obtained from any ammunition, considered apart from the influence of the rifle used, depends on the extent to which uniformity is obtained in the components of the cartridges and in their arrangement on assembling, a principal factor being the hold which the case has upon the bullet; for, although insignificant in comparison with the enormous pressure finally developed by the exploded charge, the pressure required to start the bullet from the case has a considerable effect on the burning of the charge, particularly if it be made of one of the new smokeless explosives.

The tightness with which the bullet fits the mouth of the case has also considerable effect upon the stability of the cartridges under the rough usage to which they may be subsequently subjected. For, although carefully packed, their treatment in transit by sea and land is sufficiently rough to make itself severely felt. In use also they may have to bear considerable violence, for it can easily be imagined that the speed with which 500 or 600 cartridges per minute travel backward from the feeding belt, forward into the firing chamber, and with which the empty cases are extracted, in the Maxim automatic gun, is a severe trial both for the complete cartridge and for the fired case. The safety obtained by the use of the solid drawn case inclosing the charge is remarkable; for experiments have shown that it is impossible to explode any number of such cartridges at once, either by firing one of their number or by firing into the mass. It is for such important qualities that fixed ammunition having the solid drawn case has been preferred to all other varieties, and, indeed, has, owing to the extended use of machine and quick firing guns, become indispensable.

With regard to possible future developments it may be interesting to note that ammunition has been made in which a portion of the duties usually assigned to the case is performed by the charge, which in the form of a durable stick or tube of smokeless explosive is attached at one end to the bullet and at the other end to the rudiments of a solid drawn cartridge case consisting of a short gas check with a strong base containing the detonator. Such cartridges have not as yet, however, come into practical use, and cartridges of the type shown in Figs. 28 and 29 remain for the present the principal form assumed by modern fixed ammunition.

## The Le Vasseur Boiler Tube Cutter.

This tool is intended for cutting out old boiler tubes or flues for renewal or otherwise, and for trimming off new flues or cutting pipe. It consists of a mandrel conforming loosely to the size of the tube to be cut, in which are knives or cutters radiating from an inner mandrel of varying diameter and provided with a screw by means of which the knives may be fed out as the cut in the tube progresses. These knives are attached by dovetail grooves in the mandrel.

In operation the tool is placed in the tube with the knives at the point to be cut; the tool is then revolved by means of a ratchet handle and the nut is held stationary, which gradually draws the inner mandrel toward the handle, thus

bringing the larger diameter under the heels of the knives and throwing them out against the inner wall of the tube, the operation continuing in this manner until the cut is completed. When the nut is run back to its original position the mandrel may then be pushed from the handle and the knives drawn down into their sockets and the tool removed. This cutter is made by the Gouverneur Machine Company of Gouverneur, N. J.

## Management of Men and Manufacturing Industries *

SECOND PAPER.

### Engineering the Establishment of Competitive Manufacturing Enterprises.

BY THOMAS D. WEST, SHARPSVILLE, PA.

In days of sharp competition, the starting of new enterprises soon places upon the shoulders of its managers and investors a weight they had not figured on carrying, and all sentimental ideas of self importance and there is "millions in it" vanish long before dividends are declared.

Could the struggles of late enterprises to get a foothold be fully outlined we could not fail to have volume after volume giving recitals of trials. Could the principals in them have foreseen what they had to go through, with the chances to be taken ere they could establish a paying business, there would have been much hesitancy before starting in and a great probability of their not having done so.

The writer having fought through two such undertakings within the past five years, the first being lost by fire, should be in a position to know from experience some of the difficulties attending the establishment of a business open to free competition, an element most all new enterprises have to figure on combating.

#### Procuring Proficient Employees.

Of the many struggles to be met and mastered there is none more serious than that of getting a works filled with competent, faithful employees having qualifications such as are necessary to fill the many different characteristic lines of work called for in their business.

I know that there are those who do not believe it, but nevertheless such is true. There are industries which it may take from one to three years to procure the character of employees they would like to see filling all posts of duty, and one factor almost all new enterprises should specially figure on at the start is that of not being compelled to rush out work to the full capacity of their plant.

#### Go Slow the First Year.

The endeavor to do this will often entail serious loss financially. There are few whose character of manufacture will admit of such proceedings without loss, but with almost all it is much the better plan to go easy for the first year and be under as few obligations as possible in matters of manufacturing their product.

In first starting business the quality and quantity of an employee's daily out put is to be considered. A new firm will, by having new appliances, &c., have their own customs and standard they will desire to see adopted and achieved. No matter if the mechanic or employee did do the same character of work in his last place their standard is not yours and you want the benefit of modern arrangement and tools and the work done to your idea.

If your plant is rushed your men will know it and in nine cases out of ten you will find yourself placed in the position to shut up shop or let the employees, to a degree, establish their own notions of the customs and standard to be adopted.

No one but an experienced manager knows how difficult and expensive it is to undertake to change the customs, day's work and standard in a workshop after it is once established.

If in first starting up a firm could be assured of filling all its positions with men having the character and qualifications they would like them to have, and if it were not necessary before procuring one good man to discharge in some cases a dozen, business could be figured different, and the rushing of the plant to its full capacity, turning out the quality and quantity desired profitably, could be much more satisfactorily relied upon.

Taking the employees' side of the subject, it is also better for them that the starting off of a new plant should go slow, for it gives all more room to work, a better chance for the overseer to assist them in systemizing and becoming accustomed to their labors, and should the employee at first not manifest the ability required, business not being rushing the overseer can permit the man hanging on a little longer to see if he can make any success of him, and often eventually thereby making a reliable man that can stay as long as he may desire; otherwise he might be walking the streets looking for work.

#### Endangering Life and Breaking Machinery.

A factor to be also considered by the employer and employee in starting a new plant is the much lessened risks taken in persons being injured where there is much new machinery with green hands to run it by going slow the first year.

It is much better for the overseer to have ample time to watch and educate employees in the use of tools and machinery than to have them all crowded together with a go-as-you-can principle, injuring themselves and breaking the machinery.

#### Testing New Machinery.

Another good reason why it is advisable for new firms to figure on going slow the first year is to test their machinery. The plant is yet to be built that for the first year did not discover many weak points in its appliances and machinery that required shut downs and time to strengthen and repair. If rushed with work things will be found to go wrong that would not have given any trouble could there only have been the time spared to humor and nurse them, for new machinery often requires such treatment in order to have it run and act well just as much as a sick child.

#### Financial Troubles.

As a general thing a plant will be more sure of making money by going slow the first year than by attempting to drive the plant to its utmost capacity, and it is pretty sure to be the case that more money is laid out to put up the buildings and place machinery ready to start than was figured on, and the establishment often finds itself left with a very small working capital. If with such it is attempted to rush business the first year the chances are that the plant goes under, or is involved in difficulties from which several years of profitable work may extricate it.

A firm cannot survive many blunders, and the attempt to rush business the first year is generally to try a risk. "Be sure you are right, then go ahead."

* Read before the Civil Engineers' Club of Cleveland, Ohio, September 12, 1893.

## The Classification of Steel Plates.

A prominent manufacturer of steel plates writes to us as follows on the vexed question of this classification:

The classification of steel plates, as set forth by manufacturers generally, is misleading and puzzling to the average customer. There is a wide mark from uniformity, and competition becomes a matter of unequal conditions, so that manufacturers of steel plates are bidding against each other, with quality so far apart and prices of equal difference, placing the consumer in a quandary as to what it all means and creating a distrust as to the fairness of those he purchases from.

As the facts now exist some mills are making two grades of fire box steel, two grades of flange steel and two grades of shell steel.

As a rule, the purchaser of plates will buy the cheapest—if plates are stamped to indicate grades—regardless of what the quality may be, and so it is evident that much of the steel sold in the market is not of first-class quality, because the price is so low it cannot be made first class. However, the consumer wants to get the cheapest, and he buys at the lowest price. The practice is dangerous to consumers of plates and users of boilers, because the fact is that the very best is none too good to put into use where life is at stake.

It is evident that some uniformity of classification of grade should be adhered to and insisted upon by inspection departments, and it would seem that the grades should be simple, and each to carry requirements such as will insure only first-class quality. The following would seem to be clear and well defined:

*Fire Box Steel.*

| | |
|---|---|
| Tensile strength | 54,000 to 60,000 |
| Elastic limit, per cent | 50 to 60 |
| Elongation in 8 inches, per cent | 27 to 30 |
| Reduction of area, per cent | 55 to 60 |

*Flange Steel.*

| | |
|---|---|
| Tensile strength | 54,000 to 62,000 |
| Elastic limit, per cent, at least | 50 |
| Elongation in 8 inches, per cent | 25 to 28 |
| Reduction of area, per cent | 50 to 55 |

*Shell Steel.*

| | |
|---|---|
| Tensile strength | 56,000 to 64,000 |

*Tank Steel.*

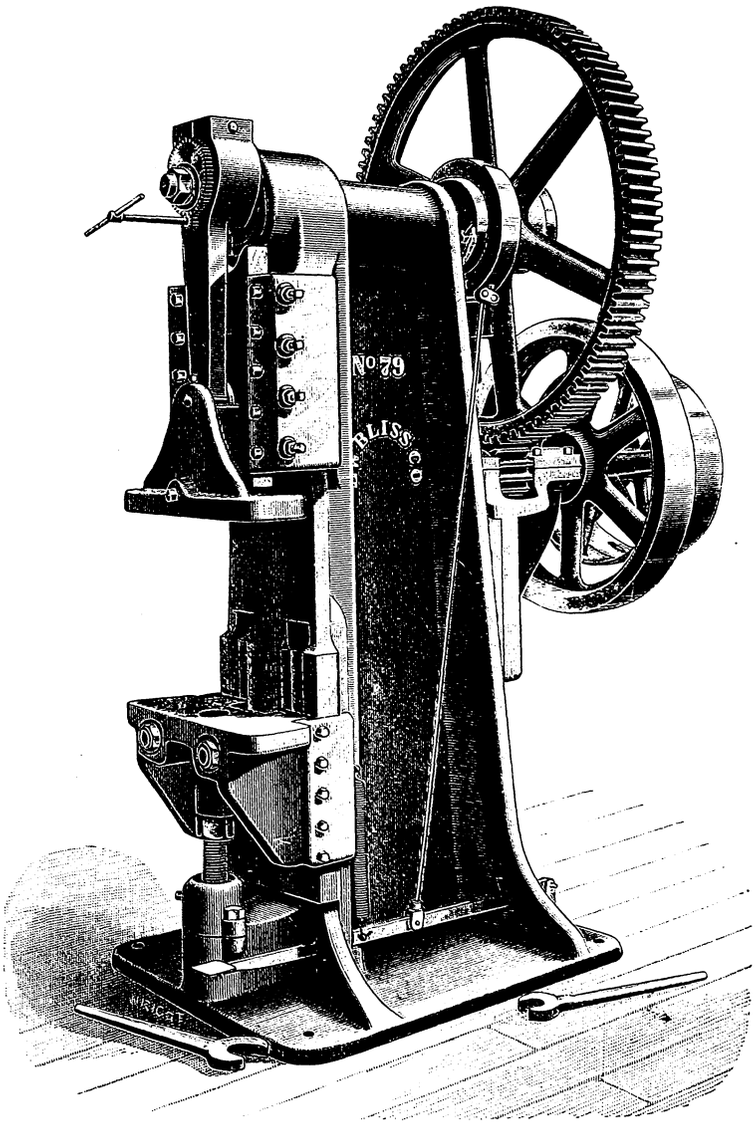
| | |
|---|---|
| Tensile strength, about | 60,000 |

It is the opinion of writer that practically the foregoing list would insure such material as would be suitable for first class work and would place a higher standard of quality before consumers, and command a comparative price, while the present system of "any quality, any price" is disastrous not only to the manufacturer as to sustaining prices, but also in the general use of boilers as to safety of life and property.

It is stated that a large quantity of steel rails have been shipped from London to Vancouver, B. C., by way of Cape Horn, for the British Columbia Pacific Railway.

## The Bliss Reducing Power Press.

The engraving shows a long stroke press designed by the E. W. Bliss Company of Brooklyn, N. Y., for redrawing, shaping, trimming and other operations on deep sheet metal articles. It is provided with a screw adjustment for the table, which permits the use of dies varying greatly in hight, and also has an eccentric device in the pitman which facilitates making the finer adjustments required for the tools. The press is provided with an automatic clutch controlled by foot power, so as to have the slide stop automatically at the top of the stroke, unless continuous strokes are wanted, in which case the foot is kept on the treadle. The machine is made with or without gearing. For broaching castings or forgings where a very slow movement is required it is frequently constructed with back gearing of much greater ratio than shown, in which case a friction clutch on the driving shaft is used instead of automatic clutch on the crank shaft. The press, as shown in the cut, weighs about 8200 pounds, has a maximum distance between bed and slide of 15½ inches, an adjustment for this space of 10 inches and a stroke up to 8 inches. The ratio of gearing is one to seven and a half and the number of strokes usually made per minute 40.




THE BLISS REDUCING POWER PRESS.

## Tariff Testimony.

A volume has been published which contains the tariff testimony submitted in hearings and in correspondence to the Ways and Means Committee. It contains a full stenographic report of the testimony submitted by the iron manufacturers, to which we referred at the time. The remarks of Joseph Wharton, W. R. Stirling, John Lambert, G. M. Laughlin and Cyrus Elder are full of interest. There are a few statements made by workmen, members of the Amalgamated Iron and Steel Association. John Jarrett, secretary of the Association of Iron and Steel Manufacturers and Tin Plate Manufacturers, presented figures relating to wages in the sheet rolling industry paid in this country and England. A letter is printed from E. H. Sears, president of the Collins Company, urging that the reciprocity features of the present law be retained, that scrap iron be placed on the free list, and that the duty on charcoal iron bars be reduced. Houghton & Richards of Boston plead for a reduction of the duty on high grade iron bars and plates, with a view to helping Low Moor. J. G. Batelle spoke on behalf of the makers of iron and steel sheets, representing 200 finishing trains of rolls, with an aggregate capacity of 400,000 tons. F. G. Niedringhaus of St. Louis, W. C. Cronemeyer of Demmler and W. B. Leeds of Elwood, Ind., were those who presented the views of the tin plate manufacturers during the same hearing.

At another time N. A. Gilbert of Cleveland made a statement on behalf of the Shelby Steel Tube Company of Shelby, Ohio, who ask that the duty be taken off from Swedish hollow billets, which they import for the manufacture of solid drawn tubing. They state that they are the only importers and on 2,505,842 pounds imported, which cost $97,158.74, they paid a duty of $38,-910.94. It is claimed that American steel makers cannot produce a satisfactory article, the analysis of which, by the way, is given as follows: Carbon, 0.13; silicon, 0.035; manganese, 0.155; sulphur, 0.005, and phosphorus, 0.041. In the course of the testimony the statement was made that the demand for bicycles is about 4 000,000 feet of cold drawn tubing per year and that last year the company, whose plant cost $350,000, made 2,000,000 feet.

Henry Disston & Sons of Philadelphia send a brief communication recommending that the duty on band saw plates, wholly or partially manufactured, black or bright, thinner than No. 13 gauge, up to 14 inches wide, be made 7 cents.

The California Wire Works of San Francisco ask that the duty on wire rods be reduced from 0.6 cent to 0.1 cent per pound. The Kidd Steel Wire Company of Sharpsburg, Pa., newly established, manufacturers of watch and needle wire, drill rods, &c., present a letter requesting the retention of the present duty on that class of wire. S. & C. Wardlow, importers, of New York, on the other hand, urge a reduction of the duties on steel and on flat steel wire or strips, on the ground that the present rates of duty are unjust to American makers of pens and producers of watch springs, &c. John A. Roebling's Sons Company point to the large increase in the imports of wire and demand a retention of present rates. The imports, which were 8,072,137 pounds in the fiscal year ending June 30, 1892, rose to 9,305,075 the next year.

The testimony of W. C. Dalgell of South Egemont, Mass., was put in on September 16. He called attention to the fact that the specific duty of 2 cents per pound is inadequate as applied to the higher grades of carriage axles. His testimony was supported by a letter similar in tenor from T. Gray of the Tomlinson Spring Company of Newark, N. J.

A particularly interesting talk is that of Thomas W. Bradley of Walden, N. Y., who with W. F. Rockwell of Meriden, Conn., represented the American pocket cutlery manufacturers. Mr. Bradley related his experience in his negotiations with the promoters of the United States Cutlery Company, his firm being mentioned in connection with it without authority.

George C. Hatch of Bridgeport submits a statement relating to the cost of pocket knives. He figures that the cost of making two dozen knives, which is an average day's work, is 70 cents in Germany and $2.20 in this country. This is the cutler's work. The cost of grinding and finishing is 24 cents in Germany and 56 cents here.

The retention of the present tariff on razors and razor blades is supported by an argument sent by J. R. Torrey of the Torrey Razor Company of Worcester, Mass., who estimates that fully 33 per cent. of the razors consumed in this

country to-day are of domestic manufacture.

A highly interesting document is that signed by James D. Foot of Kearney & Foot Company, in relation to files. Mr. Foot urges that files should be put in three classes, viz.: Files for mechanical uses, for jewelers' and silversmiths' uses and rasps for blacksmiths' or farriers' uses. Mr. Foot states that at the time when the Mills bill was being drawn up he urged a reduction of the duty on files. Now, however, he recedes from that position because the advantages once possessed by American manufacturers have disappeared. When he claimed at a former period ability to compete with foreign manufacturers in spite of a lower duty he relied upon the excellence and ingenuity of American machinery. Since that time, however, the foreigners have equipped themselves with machinery of American design, so that they are on equal terms in this respect and continue to enjoy the additional advantages of cheap labor. Mr. Foot presents some general information in regard to the decline in prices and in raw material and data relating to wages. Mr. Foot makes the somewhat surprising statement which follows: "To-day, through home competition, the price (of steel) varies from 4 to 6 cents per pound, and such is the fact that if by an act of Congress should an export business be established in files, by which the steel could be imported into this country and on custom house oath re-exported in files, thereby obtaining for the manufacturer of files a practical remittance of all duties, no manufacturer of files could afford to use this steel in comparison with home prices even with this rebate allowed. Consequently there would be no possibility of reducing the cost of producing files by a corresponding reduction in the cost of raw material in the shape of bar steel through the removal of duties on same." Mr. Foot does not seem to be aware of the fact that under the present law 99 per cent. of the duties are refunded as a drawback on exportation, so that if such a business was feasible, it could have been done for some time. We are inclined to believe, however, that foreign steel could be landed here at prices below that of American steel for a re-export business.

A number of manufacturers of shotguns urged the retention of the present duties.

The Ausable Horse Nail Company, through their president, A. Bussing, point out that the manufacture of horse nails by machinery is an American industry and that the machinery for this purpose is of exclusively American invention. The machinery now being used in Europe is built in this country. The annual production is from 6000 to 7000 tons. Mr. Bussing states that the industry can stand a reduction in the duty of 1 to 1½ cents per pound, making it 2½ to 3 cents per pound.

The interests of wood screw manufacturers are represented by a letter from M. J. Woodruff, president of the Russell & Erwin Mfg. Company of New Britain, Conn. Mr. Woodruff pronounces it a well recognized fact with all wood screw manufacturers that to provide for the daily product of each 1000 gross of screws of average sizes, capital invested in permanent plant, machinery, tools, fixtures and working means to the extent of $100,000 must be provided, and that the most successful manufacturers are unable to manufacture and market at average market prices a quantity of wood screws equal in value to the capital invested in less than two years of time; that is, it requires the market product of two years' time in which to turn the capital over once. Iron and steel wire drawn to required sizes is the raw material of the screw manufacturers. The average cost of this wire in this country to the screw manufacturers is about 3⅛ cents per pound; in England, 1⅞ cents per pound; in Germany, 1¼ cents per pound; in France, 1⅛ cents per pound; in Belgium, 1¼ cents per pound. Other incidental supplies, as oil, fuel, soda, gas, &c., bear about relative proportions.

Investigations recently made in the various foreign countries regarding comparative wages paid upon similar processes in manufacture of screws show that where the manufacturers in this country pay $1 in England is paid 52 cents, in Germany is paid 46 cents, in France is paid 47 cents and in Belgium is paid 43 cents. In Norway and Italy wages are still lower. Mr. Woodruff's company, being interested in works near Hamburg, have been able to verify this comparison.

Many foreign makers use the same pattern machinery as is used in this country, and the speed of the machine is governed by the power applied, and controls the rapidity of the product. In this country we are certainly not ahead of our foreign friends in the production or application of power for rapidity of production; consequently, one day's wages of foreign labor will produce as many screws as the same time of American labor.

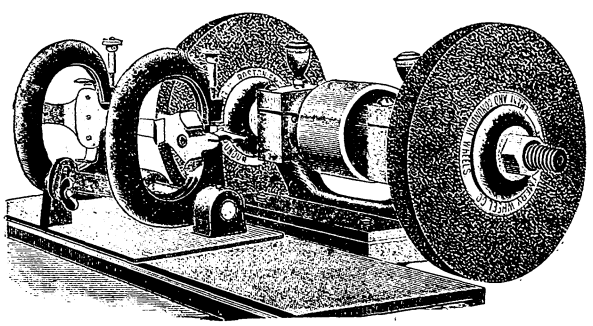
Mr. Woodruff asks for the continuance of the present classification and specific rates.

The facts relating to aluminum were presented in a paper by Albert E. Hunt, president of the Pittsburgh Reduction Company, who was closely questioned by the committee after its reading had been completed. He urges that a duty of 25 cents per pound be substituted for the present ad valorem duty of 45 per cent. upon rolled, forged or drawn bars, rods, plates, sheets, wire, pipe, tubing or castings of aluminum or of alloys of which aluminum is the component part of chief value.

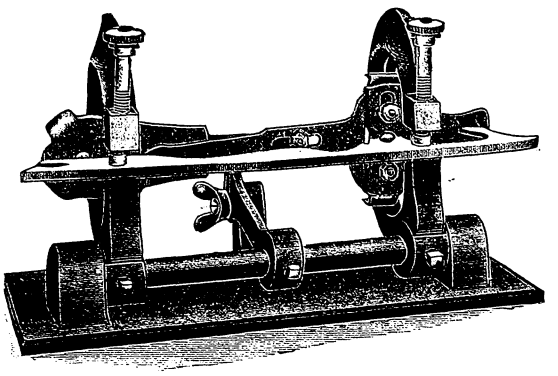
Very voluminous testimony was taken on the question of the duties on lead ores, L. E Holden, owner of the Cleveland *Plain Dealer*, and Hugh N. Camp of New York, representing the St. Joseph and Doe Run Lead companies of Missouri, being the two witnesses.

Among the other subjects taken up in the metal schedule was quicksilver, by W. B. Buckminster of the Napa Consolidated Quicksilver Mining Company; metallic bedsteads, cotton machinery, by the Knowles Loom Works, and bicycles, by the Pope Mfg. Company.

The testimony is closed by a letter from Henry T. Seymour, secretary of the American Shear Mfg. Association.



*Complete Machine.*



*Skate Holder.*

## THE KEENEDGE SKATE GRINDER.

### The Keenedge Skate Grinder.

The skate holder, shown detached in the right hand view, can be used on any emery grinder by attaching a plate to the grinder at such a hight as will bring the skate nearly opposite the center of the wheel. The holder consists of a flat bed plate upon which is mounted a shaft, carrying at each end a clamp for holding the blade of the skate. This shaft also carries a bar, by means of which the device may be adjusted so that the blade will be at the proper angle to the emery wheel. After the skate has been firmly clamped in the holder the latter is moved to and fro, the skate being held lightly against the wheel to prevent heating the runner. This holder will grind square or high on either edge, as may be desired. This device is made by Charles Perkins of Bridgewater, Mass.

## Silicon and the Grading of Pig Iron.

BY A. P. BJERREGAARD, IVANHOE, VA.

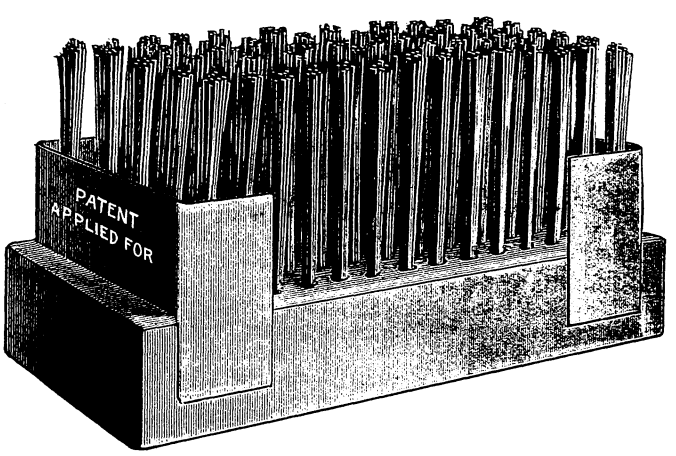
Why are there often several grades of iron in the same cast? This question often enters the mind of one having to do with the control of a blast furnace. It is a common opinion among furnacemen that they are caused by a difference in specific gravity. This explanation appears to receive corroboration from the observed fact that the closer grades are the first to leave the furnace and to fill the lower pig beds. But this phenomenon may also be attributed to the partial chilling of the iron in the cold sand runner. The runner soon becomes heated, so that the succeeding iron retains its heat, and therefore forms larger crystals. To determine whether there is any difference in specific gravity upon which the above mentioned opinion could be founded, the author made the following tests of specific gravity:

| | Specific gravity. |
|---|---|
| No. 1X pig iron | 6.972 |
| No. 2X pig iron | 7.044 |
| No. 3 pig iron | 7.109 |

*Silicon Contents of Different Grades of Pig Iron.*

| No. 1X. | No. 2X. | No. 3. |
|---|---|---|
| 3.71 | 3.57 | 3.29 |
| 3.58 | 3.43 | 3.24 |
| 3.29 | 3.19 | 3.06 |
| 2.89 | 2.35 | 2.12 |
| 2.82 | 2.47 | 2.21 |
| 2.82 | 2.45 | 2.12 |
| 2.81 | 2.49 | 2.16 |
| 2.80 | 2.48 | 2.36 |
| 2.78 | 2.63 | 2.33 |
| 2.63 | 2.35 | 2.02 |
| 2.63 | 2.04 | 1.79 |
| 2.56 | 2.45 | 2.37 |
| 2.41 | 2.32 | 2.23 |
| 2.40 | 2.04 | 1.83 |
| 2.31 | 2.16 | 2.07 |
| 2.26 | 2 17 | 2.02 |
| 1.93 | 1.88 | 1.60 |
| 1.76 | 1.22 | 0.87 |
| 1.75 | 1.41 | 1.32 |
| 1.57 | 1.27 | 1.18 |
| 1.25 | 1.03 | 0.89 |

It is the author's opinion that the variation in the silicon contents of the same cast is the cause of the difference in grade, and not an effect. For it is well known that silicon has the property of causing combined carbon dissolved in pig iron to crystallize out as graphite when the fluid iron solidifies. Since it is by the amount of coarsely crystalline graphite visible to the eye that the iron is graded, it follows that the grade is determined by the relative amount of silicon present.




STEEL WIRE BRUSH.

These figures seem to point to the truth of the opinion that the difference in grade is caused by a difference in specific gravity.

But it might reasonably be expected that these different grades or qualities of iron would become mixed, if not in the furnace at least in the runner. That they do not is proved by the difference in crystallization often observed in different parts of the same pig. It is not rare to see pigs composed of several grades arranged in crude layers, the closest generally at the bottom. However, the author has seen pigs in which the "close spot" was near the top.*

The difference of grade under discussion is not confined entirely to mere physical characteristics, but extends even to the chemical composition. This is illustrated by the following analyses. Several kinds of iron are represented. The table is arranged according to the amount of silicon in the No. 1X grade. In every case it will be seen that the No. 2X has less silicon than the No. 1X, and the No. 3 less than the No. 2X, although in each case the three grades were all produced in the same cast.

*No reference is here made to a chilled crust on the iron, which is sometimes formed. It may be either white, mottled, "close" or a lower grade of foundry iron than the heart of the pig.

The various masses of iron ore passing down through the furnace are associated with different amounts of silica, and different amounts of limestone, so that some particles of iron will have an opportunity to absorb more silicon than others. These various particles of iron, when melted, arrange themselves in layers, the heaviest, containing the least silicon, sinking to the bottom, the lightest, containing the most silicon, floating above.

Still another explanation possible is that the iron first formed lies at the bottom, and since it is for a longer time exposed to various cooling effects, it is not so hot as that above it, hence it will part with some of its silicon to its hotter neighbor above. Both these explanations will also account for the so-called "close spots." In the first case the melted iron will not all have an opportunity to reach its proper level before tapping, hence some of the closer iron will be mixed in the same pig with more open iron. In the second case the iron from next the wall will be as cold as that at the bottom, and it will become mixed with the hotter iron, so causing "spots." It may be that both these explanations are true causes.

Whatever theory may be accepted the fact remains that the most openly crytallized iron in each cast contains the most silicon, and the difference is often very great. We are, therefore, constrained to believe that the method of grading pig iron in vogue is not so arbitrary as is supposed; but that it really rests on a scientific basis.

Another fact noticeable in the table of analyses is that it is not the absolute but the relative amount of silicon that determines the grade. Whether the silicon in the whole cast is high or low, there is always more in the more open iron and less in the closer. If the comparison had been carried further, taking the "close" or gray forge grade into account, the same difference would be observed, but to a greater extent. One curious example that has come under the author's observation was some No. 2X pig iron containing a spot of white iron. The No. 2X iron contained 0.96 per cent. silicon, while the white iron layer near the bottom of the pig (yet entirely surrounded by foundry iron) contained 0.37 per cent.

There is often also a slight variation in the amounts of phosphorus and manganese in the different grades formed in the same cast, but so far no regularly occurring progressive variation has been observed. At best the difference is only a few hundredths of 1 per cent.

The phenomena discussed in this paper are entirely different from segregation. In segregation the impurities in the same pig will tend to collect themselves toward the center of the pig, whither the iron drives them while crystallizing. We have here to do with a more profound cause, one that takes its origin in the blast furnace itself.

## Steel Wire Brush.

This steel wire brush for cleaning castings is made by the S. Obermayer Company of Cincinnati, Ohio. It will be noted that there is a sheet metal strip inserted in each end of the block and which by the protection it affords the wires adds to the durability of the brush. It is stated that the wire will not crystallize and break, and that it will wear down to the block.

## Official Report on U. S. Cruiser "Columbia."

Rear Admiral Belknap, president of the Trial Board, reports to the Secretary of the Navy in regard to the recent official trial of the United States cruiser "Columbia," that the mean speed of the ship for two runs over the measured course from Cape Ann to Cape Porpoise, under forced draft, with an average air pressure of $\frac{9}{10}$ inch, carefully calculated and corrected for tidal flow, was at the rate of 22.80 knots per hour. The board finds that the "Columbia" fulfills the contract requirements in every respect, and regards the vessel as possessing qualities of steadiness, seaworthiness and ready obedience to helm in a marked degree. Only the best material and most thorough workmanship, says the report, could have produced engines and boilers of such notable performance. In conclusion the board expresses the opinion "that, in the 'Columbia,' the service and the country have a vessel that, as a type of superior construction, advanced enginery and great speed, marks an epoch in modern cruiser design and building." The result of the official speed trial insures a bonus for the "Columbia's" builders, the Cramps of Philadelphia, of about $350,000.

# THE WEEK.

Announcement is made that the Republic of Nicaragua is about to bring suit in the United States courts against the embarrassed Nicaragua Canal Construction Company for failure to fulfill their contracts with that Government. The reasons given are that no work has been done on the canal for a year and that the company have gone into the hands of a receiver.

An official report has been received in Washington from the special agent sent by the Government to investigate the gold discoveries in Minnesota. The agent reports that he is firmly convinced that the district in the vicinity of Rainy Lake is distinctively a mineral country. In the quartz of Township 71 the mineral is deemed very rich, and the land has been withdrawn from settlement.

On Wednesday, November 22, the first steel merchant vessel ever built in Maine was launched at Bath. She is the twin screw steamer "City of Lowell," built for the Norwich & New York Transportation Company, and designed by A. Cary Smith of New York. The vessel is a magnificent example of a modern Sound steamer. She is 336 feet long, 49 feet molded beam, or 66 feet from guard to guard amidship; will draw 13 feet of water when loaded and steam 20 knots an hour at the least, with a possible 22 knots. The hull is unusually strong, the frames being steel angle irons covered with steel plates $\frac{12}{16}$ inch thick. The decks are of steel covered with thick pine. The "City of Lowell" is a twin screw boat with triple expansion engines of 26, 40 and 64 inch cylinders, 36 inches stroke and 4500 indicated horse-power. Steamer will be supplied by six Scotch return tubular boilers, built for a working pressure of 165 pounds.

Experiments are being made in Italy with light electric vehicles, somewhat larger that ordinary tricycles. The vehicles are equipped with a battery of ten cells, capable of yielding sufficient energy to propel them for from three to five hours.

In Great Britain the work of connecting all the lightships and lighthouses with the telegraph system of the country has been begun.

The Alps are to be pierced by another railway tunnel. This time it is the Simplon that is to be attacked, by a company recently formed in Switzerland for the purpose. The work is estimated to cost $15,000,000 and to occupy five and a half years.

The Herreshoffs of Bristol, R. I., have received an order from a New York man for a Tobin bronze steam yacht, which, it is said, will be the finest yacht afloat. These famous builders are enthusiastic over the future and efficiency of Tobin bronze in yacht construction.

The present low price of wheat in the United States is not to be wondered at when it is considered that the stocks now held reach the immense aggregate of 67,000,000 bushels. This is double the amount held at this time last year, and is far larger than the stocks in hand at the like period for many years past.

A great pool, or combination, of the lake shipping interests which center at Buffalo and West Superior has, it is rumored, been arranged.

It is understood that the President's message to Congress will include the recommendation of an appropriation for the construction of another new battle ship and four torpedo cruisers for the navy.

Plenty of capital is said to be ready for carrying out a rapid transit system for New York City as soon as the commissioners come to a decision on the plan to be adopted.

Chicago is reported as suffering from a regular fire insurance famine. So many insurance companies have been crippled by large damage claims of late that big business concerns find it impossible to obtain all the insurance they desire to carry.

The Salvation Army in San Francisco recently undertook to sift the truth of the rumors about the large numbers of unemployed workingmen alleged to be in that city. It offered work at $1.40 a week and found no takers. The *Coast Seamen's Journal* does not think the test was a fair one.

The season's export trade of Montreal, Canada, ended on November 22, when navigation was closed. From all reports the season has been an exceptionally poor one. Freights have been remarkably low and prices bad on the other side. The amount of grain shipped from the St. Lawrence was 22,500,000 bushels.

The deplorable waste of natural gas continues. A well drilled recently near Greenfield, Ind., was wrecked by the pressure of gas, and by last accounts a flow of gas estimated at 30,000,000 cubic feet a day was rushing out unrestricted, the owners being totally unable to get it under control.

Certain localities in Ohio, West Virginia and other States are suffering from an acute visitation of the tramp plague.

Japanese trade with the United States, according to a late statement issued by the Japanese Customs Bureau, is increasing more rapidly than it is with England, France or Germany.

A British trade contemporary lays stress upon a noticeable feature that has recently developed in the engineering trades of the English Midlands—namely, the demand from Russia for machinery and plant for iron and steel making. Some important contracts have been lately forwarded and others are now in hand for rolling mill machinery of the most improved kind, showing the growth of enterprise in the direction of the manufacture of steel and iron in the dominions of the Czar.

A most curious dinner, so far as regards the place in which it was consumed, was given in Brooklyn last week, when 108 persons, guests of the Brooklyn City Railroad Company, were entertained inside the big chimney of that company's newly constructed power house. The chimney, which is 300 feet high, is the loftiest in New York State and one of the highest in the world, and forms a very conspicuous feature of the Williamsburg district of the city of Brooklyn.

A vessel sailed from San Francisco for Havre, France, last week, carrying the first full cargo of tallow ever shipped from the Pacific Coast.

October net earnings of the Reading Coal & Iron Company were $358,358, being the largest net earning for any month in the history of the corporation. It is nearly $50,000 in excess of that of October, 1892, although the ruling prices of coal at that time were 10 to 15 cents per ton higher. The company's collieries produced in October, 1893, 860,928 tons of coal, an amount only once before exceeded.

Coal fishing is a curious industry prevailing at the town of Northumberland, on the Susquehanna River. The bed of the stream in this vicinity is thickly lined with coal, washed down from various colliery centers and prevented from going beyond Northumberland by a large dam. The fuel thus recovered from the river last year amounted to 4000 tons, which was sold at an average price of $2.20 per ton.

Plans are afoot for a consolidation of the surface street railroads of Brooklyn, N. Y., with an aggregate stock of $55,000,000.

## A British Torpedo Boat Destroyer.

The British torpedo boat destroyer "Havock," recently built by Yarrow & Co. for the British Government, has, on her official trial, proved herself the fastest vessel in the British Navy, having maintained during three hours a mean speed of 26¼ knots per hour. This speed was the more remarkable on account of the trial having taken place in a very heavy sea, the water finding its way even into the engine room. The "Havock" is the first of 12 similar vessels of an entirely new and distinctive type, which are being built for the British Admiralty by private contract, after the design of the Director of Naval Construction, W. H. White. They are intended, as their name indicates, to act against torpedo boats, and to exceed those boats in speed. The "Havock" is 180 feet long by 18½ feet beam, and about 200 tons displacement. She has two sets of triple expansion engines, with cylinders 18, 26 and 39½ inches in diameter, by 26 inches stroke, designed to give 3500 horse-power at 400 revolutions per minute. They drive twin screws, having three manganese bronze blades, 6 feet 2 inches in diameter. Her boilers are two in number and of the locomotive type, one to each set of engines, in separate stokeholds, forced draft being supplied to them by two fans by Allen & Co., and are designed for a working pressure of 180 pounds per square inch. The armament of the "Havock" consists of one 12-pounder and three 6 pounder rapid fire guns, as well as one fixed bow torpedo and two revolving deck tubes, 18 inches in diameter. She carries an electric search light. Yarrow & Co. are building a sister ship, the "Hornet," from which they expect to obtain a speed of 27 knots.

At a fully attended meeting of the iron trade of Boston held November 20, noon, at the Chamber of Commerce, to take action on the death of Charles T. Richardson, who for more than 30 years has been identified with the iron trade of this city, the following resolutions were passed: "Called together by the event of the death of one of their number, Charles Tyng Richardson, who passed away November 18, 1893, the members of the iron and steel trade of Boston desire to express their appreciation of his integrity and honorable career as a merchant, and his kind and upright character as a friend and associate, and their sorrow at his death. They offer to his surviving family their tender and heartfelt sympathy in their great sorrow and affliction, and it is resolved, that a copy of the above be sent to the family and the trade be represented at the funeral."

# The Iron Age

New York, Thursday, November 30, 1893.

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JOHN S. KING, - - - BUSINESS MANAGER.


## Time to Look for Better Business.

It is a queer sort of philosophy that does not recognize conditions as they exist. It is more singular still that credit should be expected for the profound act of shutting one's eyes and refusing to look. Yet this is being done by persons connected with the iron trade who fancy that they possess some influence as leaders of opinion. For many weary months, so many that we dislike to count them, trade has been so bad that it could hardly be worse, and yet there are individuals to be found, and of some pretensions to leadership, who persistently ignore the distress into which manufacturers and merchants have been plunged and tell them in effect that matters are not really bad, but to keep up their spirits, as times will surely be better by and by. This is a Micawber like spirit, merely waiting for something to turn up. It is not the spirit of an alert business man keenly alive to the influences prevailing at the moment and studying how he can best take advantage of them and rise above them. When business is poor such a man realizes it, acknowledges the fact and endeavors to put himself in shape to endure it. There is nothing to be gained by his being falsely told that he is mistaken in his views, that he will soon find affairs very much improved, and that then he will laugh at his apprehensions of trouble.

We believe that manufacturers are to-day not much in need of advice how to act. Those who hardly knew what to do when hard times so suddenly chilled them have been driven by the force of circumstances into the only course possible. They have retrenched in every way and in directions which at one time would not have been deemed open for such action. Expenses have been curtailed which seemed to be rigidly fixed. Arguments as to costs by sellers of materials have been wholly ignored, and prices have ruthlessly been beaten down, making such producers in their turn grapple with their own difficult problems. Without concerted action, and with no preconceived theories as to a permanent lowering of values, the whole country has nevertheless proceeded in that direction, and to day we find ourselves to have been participants in a revolution. It is possible that a reaction may be inspired by causes now wholly invisible which will again force prices on a higher plane, but it seems to us the part of wisdom to base no hopes on such a change.

Accepting values as they exist to-day, that manufacturer or merchant who is able to adjust his views most quickly to the new order of things will reap the greatest benefits. In many lines possible tariff changes have already been anticipated. Perhaps most commodities have fallen in price as low as, if not lower than, prospective reductions in duties might have forced them to go if a new tariff had been put into effect over night. If this is the case, there is no reason why business men generally should not feel confidence in existing values and purchase freely to cover their known requirements. The worst having been prepared for, the general interests of the country are just so much better off, as the reductions in duty when made are found to fall short of what had been expected.

With the revision of the tariff discounted, so that it is no longer a bugaboo, and with the currency question happily settled on a sound basis, thus checking the flow of gold abroad, there is nothing to prevent a revival of trade except the lack of confidence, which was so rudely shaken during the past spring and summer. If the philosophers of optimism and cheerfulness can stimulate the growth of confidence, now is the time for them to come forward, but the people have probably lost faith in such blind leaders who did not recognize calamity when brought face to face with it.

## The Wilson Tariff.

We believe that iron manufacturers generally had settled down to the belief, during the past few weeks, that the rates of duty which would be proposed by the Ways and Means Committee would not be very radical. Apparently reliable forecasts of the principal features of the measure had agreed pretty well. None of them had prepared the metal industries for the heavy blow which is now aimed at them. At first sight the figures may not look alarming, because a comparison is difficult. A closer study is well calculated to bring consternation and dismay to the manufacturers and wage earners in the great American industries involved. That study presupposes familiarity with foreign values, to which the American iron trade has given little attention for some time, since domestic competition has crowded prices to a level at which foreign material has been practically out of the race, under the present rates of duty.

The plea made by Mr. Wilson that ad valorem rates of duty offer less opportunity for fraud than specific rates, because cheap weighers can be more readily bribed, will be brushed aside contemptuously by every business man, be he importer or manufacturer. The ad valorem rates have been adopted because they disguise the heavy cut made, and because with ignorant people they leave the impression that the iron industry has been generously dealt with. We shall not now deal with the inconsistencies of a measure which puts cotton ties on the free list as a raw material. We shall return later on to that grave defect in the bill which puts goods of the highest finish on the same basis as the cruder forms of the same group. We propose now merely to present some figures which will enable the trade to appreciate how sweeping the measure is.

Let it be fully understood at the outset that ad valorem duties are assessed on the market value at foreign works, so that it may happen that it is cheaper to buy from an inland plant abroad than from one which from its location at tidewater would be the natural seller. The apparently generous percentages are not measured upon American values, but upon the lowest foreign prices, often made to clear the home markets of European producers of an uncomfortable surplus. In our computations we have calculated the pound sterling at $4.88, and the mark per metric ton at 25 cents per gross ton.

*Pig Iron.*—Beginning with pig iron, we find that makers' brands of Cumberland Bessemer pig have sold as low as 42 shillings, or $10.25, f.o.b. With a duty of 22½ per cent. the rate would be $2.31, against $6.72 at present, a cut of $4.40. No. 1 Coltness Scotch foundry iron has sold down to 50 shillings, which would make the duty $2.75, or a cut of $4. The lowest price at which Scotch warrants have sold, so far as our records go, is 37 shillings, in June, 1888, which is $9.03. At this valuation the duty would be $1.99. A good deal has been said lately about the low prices at which Alabama warrants have been placed. The recent transactions referred to by us were at $7.50. Now, the cost of hauling the iron to tidewater at Savannah is $2, and it takes $2 more to bring it to New York. In other words, Alabama in the days of its greatest distress cannot get to tidewater as cheaply as Scotch iron on board ship at Glasgow, American duty paid, and cannot reach New York as cheaply as can the Scotch warrant iron.

Middlesborough warrants sold down, in July, 1886, to 29 shillings, equal to $7.07. On this valuation the duty would be $1.58 only. We do not know what could be done in freights from the East Coast, but a liberal allowance would put this warrant iron, if its lowest price were repeated, at $10.50, ex-ship New York.

*Steel Rails.*—The steel rail manufacturers have been led to believe that even the extremists would not venture to place the duty on that product at less than $5 per ton. But the rate has been put at 25 per cent. With rails at £3. 10/ at English works this figures out $4.25, as against $13.44, the present duty. Steel rails can be laid down under the proposed duty at $24, New York, figuring $1.75 for land and ocean freight and 50 cents for insurance and unloading. This would give foreign makers the Gulf markets, and surrender to them the Pacific Coast. Inci-

dentally it may be remarked that the latter market will be completely controlled by foreign producers in the whole line of iron and steel manufacture from one end to the other.

Lest the statement that the Gulf markets would be lost be held to be too sweeping, we are in a position to state on the authority of a leading firm of importers that negotiations for the sale of a block of 5000 tons of English steel rails fell through recently because a 5-shilling freight could not be secured. The buyer was willing to pay $30 at New Orleans. The English maker was anxious to sell at that figure, paying even $13.44 per ton duty.

*Steel Billets.*—In soft steel billets the Germans are by far the lowest sellers. At the present time 60 marks at works could be done, say $16. At the 25 per cent. rate of duty this would figure $4, or a cut of nearly $5 per ton, so that foreign billets could be landed at New York at $22.75 to $23. In this, as in other articles, the present domestic price could be low enough to keep out the foreign product. But it must be remembered that present domestic prices represent panic values, at which profits are squeezed out of everything, even to the best located and best equipped plants, and at which wages have been cut down to a level never attained during the last 20 years, and let it be hoped not to be reached again after the coming recovery.

*Beams.*—On structural shapes the proposed duty is 35 per cent. ad valorem. This article is sold, for American sections, at interior German mills at 75 marks per ton, or, say, $18.75, which would make the duty $6.56 per gross ton, as compared with the present rate of $20.16, or only one-third. Land and water freights and charges would put the German steel beams into this market at, say, 1.50 cents, when the lowest at which Western beams have sold in this market is 1.60 cents per pound. At this price confessedly the Eastern works cannot compete. The New England market would be lost to the domestic mills. Belgian beams at 110 francs, f.o.b. Antwerp, figure close to the German article. It may be of interest to note that a representative of a Belgian steel works began offerings of its material on the day following the announcement of the Wilson tariff.

*Bars and Plates.*—Welsh bars can be bought at £4. 10/, which at 30 per cent. could make the duty $6.59 and would enable the foreign makers to put them down at 1.40 cents, New York, coming close to our quotations for common iron. Marked Staffordshire bars are quoted at £6, on which the duty would be $8.78 per gross ton, allowing them to reach our shores at, say, 1.80 cents. In steel plates our mills could probably hold their own.

*Tin Plates.*—Recent quotations in Wales are 10 shillings and 6 pence for Bessemer plates, or, say, $2.56 per box of 108 pounds. At 40 per cent. the duty would amount to $1.03 per box, against $2.38 at the present time. In other words, the present duty would be reduced more than one-half on common plates, and about that amount on the better grades.

*Metals.*—The transfer of copper and its ores to the free list is a matter of indifference to American producers, as one of the foremost champions of their cause in former years acknowledged to the writer. We have become such great exporters that we have long been practically on the basis of the world's markets. Our nickel production is limited to one mine, which probably is unable to compete under any circumstances against the great deposits of Sudbury. We have never been able to establish a satisfactory antimony industry, while the producers of pig tin have forfeited all claims to consideration. The most serious proposal is that relating to lead. The duty is cut down one-half and the doors are opened wide to the importation of Mexican and Canadian ores. The latter particularly will develop into a very formidable competitor during the next few years. With silver down to present prices, and lead cut down to an importation point of 3 cents, New York, mining in the Rocky Mountains will suffer frightfully. Justice has not been done to the growing aluminum industry.

We believe that we have afforded an opportunity to appreciate how radical are the reductions proposed. The articles which we have touched cover only the coarser forms, which are relatively better able to resist the shock. Those goods into which labor enters to a much greater extent are in a much worse condition. Analysis is more difficult, but very striking facts will be presented.

Even when apparently our industries are safe, there is real and imminent danger. We are selling at panic prices now, and wages and profits are below a living level. Those who framed the Wilson bill now declare that we shall not rise above that level, that the plants and men now idle shall remain unemployed, and that our producers shall surrender the Pacific Coast and a part of the Gulf and New England markets.

We join with the majority in the trade in believing that the Wilson bill, in its present form, cannot pass, chiefly because it is so radical that it antagonizes sections of the country without whose active support it cannot hope to pull through both Houses of Congress.

Although the majority of the Ways and Means Committee has overshot its mark, all our industries must for months to come suffer from uncertainty and dread. The winter threatens to be an unprecedentedly poor one in the iron trade, for which the blame will rest with the majority of the Ways and Means Committee.

# THE TARIFF BILL.

**The bill to reduce taxation, to provide revenue for the Government and for other purposes has at length come forth from the Committee on Ways and Means.**

**The following is the complete text of the metal schedule, with the rates for the corresponding articles under the act of 1890. The difference can therefore be readily computed. The free list is also given, so far as it concerns raw materials of metals:**

### Schedule C.—Metals and Manufactures of.

IRON AND STEEL.

108. Iron in pigs, iron kentledge, spiegeleisen, ferromanganese, ferrosilicon, wrought and cast scrap iron, and scrap steel, twenty-two and one-half per centum ad valorem; but nothing shall be deemed scrap iron or scrap steel except waste or refuse iron or steel fit only to be remanufactured; Act 1890, three-tenths cent a pound.

109. All iron in slabs, blooms, loops, or other forms more advanced than pig iron, and less finished than iron in bars, twenty-five per centum ad valorem.

110. Bar iron, rolled or hammered round iron, in coils or rods, and bars or shapes of rolled iron, thirty per centum ad valorem; 1890, bar iron, eight-tenths, nine-tenths, one cent per pound; round iron, one and one-tenth cent a pound, with provisos. The act of 1883, respective rates were eight-tenths, one, one and one-tenth cents per pound, and round iron, one and two-tenths cents a pound.

111. Beams, girders, joists, angles, channels, car-truck channels, T T, columns and posts or parts or sections of columns and posts, deck and bulb beams, and building forms, together with all other structural shapes of iron or steel, whether plain or punched, or fitted for use, thirty-five per centum ad valorem; 1890, nine-tenths cent per pound; 1883, one and one-quarter cents per pound.

112. Boiler or other plate iron or steel, except saw plates hereinafter provided for, not thinner than number ten wire gauge, sheared or unsheared, and skelp iron or steel sheared or rolled in grooves, thirty per centum ad valorem; 1890, five-tenths, one and four-tenths, sixty-five-one-hundredths cent per pound; eight-tenths, one and one-tenth, one and five-tenths, two, two and eight-tenths, three and one-half cents per pound according to value; above thirteen cents per pound, forty-five per centum ad valorem.

113. Forgings of iron or steel, or forged iron or steel combined, of whatever shape, or in whatever stage of manufacture, not specially provided for in this act, thirty per centum ad valorem; 1890, two and three-tenth cents per pound.

114. Hoop, band, or scroll iron or steel, except as otherwise provided for in this act, thirty per centum ad valorem; 1890, one, one and one-tenth and one and three-tenths cents per pound.

115. Railway bars, made of iron or steel, and railway bars made in part of steel, T rails, and punched iron or steel flat rails, twenty-five per centum ad valorem; 1890, six-tenths cent per pound.

116. Sheets of iron or steel, common or black, including all iron or steel commercially known as common or black taggers' iron or steel, and skelp iron or steel, thirty-five per centum ad valorem; 1890, one, one and one-tenth and one and four-tenths cents per pound.

117. All iron or steel sheets or plates, and all hoop, band, or scroll iron or steel, excepting what are known commercially as tin plates, terne plates, and taggers tin, and hereinafter provided for, when galvanized or coated with zinc or spelter, or other metals, or any alloy of those metals, thirty-five per centum ad valorem; 1890, three-quarter cent per pound more than corresponding gauges black sheets.

118. Sheet iron or sheet steel, polished, planished, or glanced, by whatever name designated, thirty-five per centum ad valorem: 1890, two and one-half cents per pound.

119. Sheets or plates of iron or steel, or taggers' iron or steel, coated with tin or lead, or with a mixture of which these metals, or either of them, is a component part, by the dipping or any other process, and commercially known as tin plates, terne plates, and taggers' tin, forty per centum ad valorem; 1890, two and two-tenths cents per pound.

120. Steel ingots, cogged ingots, blooms and slabs, by whatever process made; die blocks or blanks; billets and bars, and tapered or beveled bars; steamer, crank and other shafts; shafting; wrist or crank pins; connecting rods and piston rods; pressed, sheared, or stamped shapes; saw plates, wholly or partially manufactured; hammer molds or swaged steel; gun-barrel molds not in bars; alloys used as substitutes for steel tools; all descriptions and shapes of dry sand, loam, or iron-molded steel castings; sheets and plates not specially provided for in this act; and steel in all forms and shapes not specially provided for in this act, twenty-five per centum ad valorem; 1890, four-tenths, five-tenths, eight-tenths, nine-tenths, one and two-tenths, one and six-tenths, two, two and eight-tenths, three and one-half, four and two-tenths and seven cents per pound, according to value.

WIRE.

121. Wire rods: Rivet, screw, fence, and other iron or steel wire rods, and nail rods, whether round, oval, flat, square, or in any other shape, in coils or otherwise, thirty per centum ad valorem; 1890, six-tenths cent per pound.

122. Wire: Iron or steel wire, and wire or strip steel, commonly known as crinoline wire, corset wire, and hat wire, flat steel wire, or sheet steel in strips, uncovered or covered with cotton, silk or other material, iron or steel wire cloths, and iron or steel wire nettings made in meshes of any form, iron or steel wire coated with zinc or tin,

or any other metal, wire rope and wire strand, thirty per centum ad valorem; 1890, one and one-quarter, one and three-quarters, two and one quarters and three cents per pound, according to gauge.

GENERAL PROVISIONS.

123. No allowance or reduction of duties for partial loss or damage in consequence of rust or of discoloration shall be made upon any description of iron or steel, or upon any article wholly or partly manufactured of iron or steel.

MANUFACTURES OF IRON AND STEEL.

124. Anchors, or parts thereof, of iron or steel, mill irons and mill cranks of wrought iron, and wrought iron for ships, and forgings of iron or steel, or of combined iron and steel, for vessels, steam engines and locomotives, or parts thereof, twenty-five per centum ad valorem; 1890, one and eight-tenths cents per pound.

125. Axles, or parts thereof, axle bars, axle blanks, or forgings for axles, whether of iron or steel, without reference to the stage or state of manufacture, twenty-five per centum ad valorem; 1890, two cents per pound.

126. Anvils of iron or steel, or of iron and steel combined, by whatever process made, or in whatever stage of manufacture, twenty-five per centum ad valorem; 1890, two and one half cents per pound.

127. Blacksmiths' hammers and sledges, track tools, wedges, and crowbars, whether of iron or steel, twenty-five per centum ad valorem; 1890, two and one-quarter cents per pound.

128. Boiler or other tubes, pipes, flues, or stays of wrought iron or steel, twenty-five per centum ad valorem; 1890, two and one-half cents per pound.

129. Bolts, with or without threads or nuts, or bolt blanks, and finished hinges or hinge blanks, whether of iron or steel, twenty-five per centum ad valorem; 1890, two and one-half cents per pound.

130. Card clothing, thirty per centum ad valorem.

131. Cast iron pipe of every description, twenty-five per centum ad valorem; 1890, nine-tenths cent per pound.

132. Cast iron vessels, plates, stove plates, and irons, sad irons, tailors' irons, hatters' irons, and castings of iron, not specially provided for in this act, twenty-five per centum ad valorem; 1890, one and two-tenths cents per pound.

133. Castings of malleable iron not specially provided for in this act, twenty-five per centum ad valorem; 1890, one and three-quarters cents per pound.

134. Cast hollow ware, coated, glazed, or tinned, thirty per centum ad valorem; 1890, three cents per pound.

135. Chains of all kinds, made of iron or steel, thirty per centum ad valorem; 1890, one and six-tenths, one and eight-tenths and two and one-half cents per pound.

CUTLERY.

136. Penknives or pocket knives of all kinds, or parts thereof, and erasers, or parts thereof, wholly or partly manufactured, razors and razor blades, finished or unfinished, valued at not more than sixty cents per dozen, thirty-five per centum ad valorem; valued above that, forty-five per centum ad valorem; 1890, twelve cents, fifty cents, one dollar, two dollars, and fifty per cent. per dozen.

137. Swords, sword blades, and side arms, thirty-five per centum ad valorem; 1890, thirty-five per centum.

138. Table knives, forks, steels, and all hunting, kitchen, bread, butter, vegetable, fruit, cheese, plumbers', painters', palette, and artists' knives; also all carving, cooks', and butchers' knives, forks, and steels. All sizes of all of the above, finished or unfinished, thirty-five per centum ad valorem; 1890, ten cents to five dollars, and thirty per cent. per dozen.

139. Files, file blanks, rasps, and floats, of all cuts and kinds, thirty-five per centum ad valorem; 1890, thirty-five cents to two dollars per dozen.

FIREARMS.

140. Muskets, muzzle loading shotguns, and sporting rifles, and parts thereof, twenty-five per centum ad valorem; 1890, twenty-five per centum.

141. Sporting, breech loading shotguns and pistols, and parts thereof, thirty per centum ad valorem; 1890, one dollar and fifty cents to six dollars, and thirty-five per centum; one dollar, and thirty-five per centum; and forty cents and one dollar, and thirty-five per centum.

142. Sheets, plates, wares, or articles of iron, steel, or other metal, enameled or glazed with vitreous glasses, thirty-five per centum ad valorem; 1890, forty-five per centum. and fifty per centum.

NAILS, SPIKES, TACKS, AND NEEDLES.

143. Cut nails and cut spikes of iron or steel, twenty five per centum ad valorem; 1890, one cent per pound.

144. Horseshoe nails, hob nails, and all other wrought iron or steel nails not specially provided for in this act, twenty-five per centum ad valorem; 1890, four cents per pound.

145. Wire nails made of wrought iron or steel, twenty-five per centum ad valorem; 1890, two cents to four cents per pound.

146. Spikes, nuts, and washers, and horse, mule, or ox shoes, of wrought iron or steel, twenty-five per centum ad valorem; 1890, one and eight-tenths cents per pound.

147. Cut tacks, brads, or sprigs of all kinds, twenty-five per centum ad valorem; 1890, two and one-quarter cents per thousand, two and three-quarters cents per pound.

148. Needles for knitting or sewing machines, crochet needles and tape needles and bodkins of metal, twenty-five per centum ad valorem; 1890, thirty-five per centum and twenty-five cents per pound.

PLATES.

149. Steel plates engraved, stereotype plates, electrotype plates, and plates of other materials, engraved or lithographed, for printing, twenty-five per centum ad valorem; 1890, twenty-five per centum.

150. Railway fish-plates or splice bars, made of iron or steel, twenty-five per centum ad valorem; 1890, one cent per pound.

151. Rivets of iron or steel, thirty per centum ad valorem; 1890, two and one half cents per pound.

SAWS.

152. Crosscut saws, mill, pit, and drag saws, circular saws, hand, back, and all other saws, twenty-five per centum ad valorem; 1890, eight cents to fifteen cents per linear foot; circular, thirty and forty per centum

153. Screws, commonly called wood screws, thirty per centum ad valorem; 1890, five cents to fourteen cents per pound, according to length.

154. Wheels, or parts thereof, made of iron or steel, and steel-tired wheels for railway purposes, whether wholly or partly finished, and iron or steel locomotive, car, or other railway tires or parts thereof, wholly or partly manufactured, 1890, two and one-half cents per pound; and ingots, cogged ingots, blooms, or blanks for the same without regard to the degree of manufacture, thirty-five per centum ad valorem; 1890, one and three-quarter cents per pound.

MISCELLANEOUS METALS AND MANUFACTURES OF.

155. Aluminium or aluminum, in crude form, alloys of any kind in which aluminum is the component material of chief value, fifteen per centum ad valorem; 1890, fifteen cents per pound.

156. Argentine, albata or German silver unmanufactured, fifteen per centum ad valorem; 1890, twenty-five per centum.

157. Brass, in bars or pigs, old brass, clippings from brass or Dutch metal, and old sheathing, or yellow metal, fit only for remanufacture, ten per centum ad valorem; 1890, one and one-half cents per pound.

158. Bronze powder, 1890, twelve cents per pound; metallics or flitters, bronze or Dutch metal, or aluminum, in leaf, thirty per centum ad valorem; 1890, eight cents package one hundred leaves.

COPPER.

159. Copper in rolled plates, called braziers' copper, sheets, rods, pipes, and copper bottoms, also sheathing or yellow metal of which copper is the component material of chief value, and not composed wholly or in part of iron ungalvanized, twenty per centum ad valorem; 1890, thirty-five per centum.

GOLD AND SILVER.

160. Bullions and metal thread of gold, silver, or other metals, not specially provided for in this act, twenty-five per centum ad valorem; 1890, thirty per centum.

161. Gold leaf, thirty-five per centum ad valorem; 1890, two dollars per package five hundred leaves.

162. Silver leaf, thirty-five per centum ad valorem; 1890, seventy-five cents per package five hundred leaves.

LEAD.

163. Lead ore and lead dross, fifteen per centum ad valorem upon the lead contained therein, according to the sample and assay at the port of entry: *Provided*, That all ores containing silver and lead, in which the value of the silver contents shall be greater than the value of lead contents, according to sample and assay at the port of entry, shall be considered silver ores; 1890, one and one-half cents per pound.

164. Lead in pigs and bars, molten and old refuse lead run into blocks and bars, and old scrap lead fit only to be remanufactured, one cent per pound; 1890, two cents per pound: *Provided*, That in case any foreign country shall impose an export duty upon lead ore or lead dross or silver ores containing lead, exported to the United States from such country, then the duty upon lead in pigs and bars, molten and old refuse lead run into blocks and bars, and old scrap lead fit only to be remanufactured, herein provided for, when imported from such country, shall remain the same as fixed by the law in force prior to the passage of this act.

165. Lead in sheets, pipes, shot, glaziers' lead, and lead wire, one cent per pound; 1890, two and one-half cents per pound.

166. Pens, metallic, except gold pens, thirty-five per centum ad valorem; 1890, twelve cents per gross.

167. Penholder tips, penholders or parts thereof, and gold pens, twenty-five per centum ad valorem; 1890, thirty per centum.

168. Pins, metallic, including hair pins, safety pins, and hat, bonnet, shawl and belt pins, not commercially known as jewelry, twenty per centum ad valorem; 1890, thirty per centum.

169. Type-metal, and new types, fifteen per centum ad valorem; 1890, one and one-half cents per pound for lead, twenty-five per centum new types.

WATCHES.

170. Chronometers, box or ship's, and parts thereof, ten per centum ad valorem; 1890, ten per centum.

171. Watches and clocks, or parts thereof, whether separately packed or otherwise, twenty-five per centum ad valorem; 1890, twenty-five per centum.

ZINC OR SPELTER.

172. Zinc in blocks or pigs, twenty per centum ad valorem; 1890, one and three-quarters cents per pound.

173. Zinc in sheets, twenty-five per centum ad valorem; 1890, two and one-half cents per pound.

174. Zinc, old and worn-out, fit only to be remanufactured, fifteen per centum ad valorem; 1890, one and one-quarter cents per pound.

175. Manufactured articles or wares, not specially provided for in this act, composed wholly or in part of any metal, and whether partly or wholly manufactured, thirty-five per centum ad valorem; 1890, 45 per centum.

THE FOLLOWING IS THE FREE LIST:

Antimony ore.
Bells, broken, and metal.
Bullion gold and silver.
Coal, anthracite, bituminous and shale, and coal slack or culm.
Coke.
Copper in ores.
Old copper.
Regulus of copper, and black and coarse copper and copper cement.
Copper in plates, bars, ingots or pigs or other forms not manufactured.
Cotton ties of iron or steel, cut to length and with or without buckles for baling cotton.
Iron ore, including manganiferous iron ore, also the dross or residium from burnt pyrites, and sulphur ore as pyrites or sulphuret of iron in its natural state.
Models of inventions.
Needles.
Nickel, nickel oxide, alloy of any kind in which nickel is the component material of chief value.
Ores of gold, silver and nickel, and nickel matte.
Pewter and Britannia metal,
Platina in ingots, &c.
Platinum, unmanufactured, &c.
Plows, tooth and disk harrows, harvesters, reapers and other agricultural implements.
Quicksilver.
Shotgun barrels.
Tin ore, &c., cassiterite or black oxide of tin, and tin in bars, &c.

# A Comparison of the Present and Proposed Duties.

| Articles. | Present Duties. | Proposed Duties. |
|---|---|---|
| Iron ore | 75 cents per ton. | Free. |
| Pig iron | $6.72 per ton. | 22½ % ad valorem. |
| Wrought scrap iron, cast scrap iron and scrap steel | $6.72 per ton. | |
| Iron rails over 25 pounds | $13.44 per ton. | 30 % ad valorem. |
| Steel rails over 25 pounds | | |
| Iron or steel rails not over 25 pounds | | |
| Iron or steel flat rails, punched | | |
| Flat bar iron not less than 1 inch wide nor less than ⅜ inch thick | 8-10 cent per pound. | 30 % ad valorem. |
| Round bar iron not less than ¾ inch in diameter, and square bar iron not less than ¾ inch square | 9-10 cent per pound. | |
| Flat bar iron less than 1 inch wide or ⅜ inch thick, round bar iron from 7-16 to ¾ inch in diameter, and square bar iron less than ¾ inch square | 1 cent per pound. | |
| Round iron less than 7-16 inch in diameter | 1 1-10 cents per pound. | |
| Rolled iron not specially enumerated | 1 1-10 cents per pound. | |
| All iron bars, blooms, billets or sizes or shapes of any kind, in the manufacture of which charcoal is used as fuel | $22 per ton. | |
| Iron or steel, with longitudinal ribs for the manufacture of fencing | 6-10 cent per pound. | |
| Beams and structural shapes | 8-10 cent per pound. | 35 % ad valorem. |
| Plate iron or steel not thinner than No. 10 wire gauge: | | |
| Valued at 1 cent per pound or less | 5-10 cent per pound. | 30 % ad valorem. |
| " above 1 cent and not above 1.4 cents per pound | 65-100 cent per pound. | |
| " " 1.4 " " " 2 " " | 8-10 cent per pound. | |
| " " 2 " " " 3 " " | 1.1 cents per pound. | |
| " " 3 " " " 4 " " | 1.5 cents per pound. | |
| " " 4 " " " 7 " " | 2.0 cents per pound. | |
| " " 7 " " " 10 " " | 2.8 cents per pound. | |
| " " 10 " " " 13 " " | 3.5 cents per pound. | |
| " " 13 " per pound | 45 per cent. | |
| Galvanized plates and sheets: | | |
| Thinner than No. 10 and not thinner than No. 20 wire gauge | 1.75 cents per pound. | 35 % ad valorem. |
| " " 20 " " " 25 " | 1.85 cents per pound. | |
| " " 25 wire gauge | 2.15 cents per pound. | |
| Polished, planished or glanced sheet iron or sheet steel | 2½ cents per pound. | |
| Plate or sheet or taggers iron or steel, pickled | 1.35 cents per pound. | |
| Sheet iron: | | |
| Thinner than No. 10 and not thinner than No. 20 wire gauge | 1 cent per pound. | |
| " " 20 " " " 25 " | 1.10 cents per pound. | |
| " " 20 wire gauge | 1.40 cents per pound. | |
| Taggers iron | 1 cent per pound until after July 1, 1891; after that date 2.2 cents per pound. | 40 % ad valorem. |
| Tin plates | | |
| Cotton ties | 2-10 cent per pound additional on hoop, &c., from which they are made = 1 3-10 cents per pound. | |
| Hoop iron: | | |
| Valued at 3 cents per pound or less, 8 inches or less in width and less than ⅜ inch thick, and not thinner than No. 10 wire gauge | 1 cent per pound. | 35 % ad valorem. |
| Thinner than No. 10 and not thinner than No. 20 wire gauge | 1 1-10 cents per pound. | |
| Thinner than No. 20 wire gauge | 1 3-10 cents per pound. | |
| Cast iron pipe | 9-10 cent per pound. | 25 % ad valorem. |
| Cast iron stove plates, &c. | 1 2-10 cents per pound. | |
| Iron castings not specially enumerated | 1¾ cents per pound. | |
| Cut nails and spikes (iron or steel) | 1 cent per pound. | |
| Wire nails | 2¼ cents per 1000. | |
| Cut tacks not exceeding 16 ounces to the 1000 | 2¾ cents per 1000. | |
| " exceeeding 16 ounces to the 1000 | | |
| Iron or steel fish plates: | | |
| Two inches long or longer, not lighter than No. 12 wire gauge | 2 cents per pound. | |
| From 1 to 2 inches in length, lighter than No. 12, not lighter than No. 16 | 2½ cents per pound. | |
| Shorter than 1 inch and lighter than No. 16 wire gauge | 4 cents per pound. | |
| Malleable iron castings not specially enumerated | 1¾ cents per pound. | |
| Spikes, nuts, washers and horseshoes | 1 8-10 cents per pound. | |
| Rivets | 2½ cents per pound. | 30 % ad valorem. |
| Bolts or bolt blanks, hinges or hinge blanks | 2¼ cents per pound. | 25 % ad valorem. |
| Anchors | 1 8-10 cents per pound | |
| Anvils | 2½ cents per pound. | |
| Forgings for vessels, steam engines and locomotives | 1 8-10 cents per pound. | |
| Iron or steel axles | 2 cents per pound. | |
| Blacksmiths' hammers and sledges | 2¼ cents per pound. | |
| Forgings not specially enumerated | 2 3-10 cents per pound. | |
| Horseshoe nails and hob nails | 4 cents per pound. | |
| Boiler tubes, or flues, or stays, of wrought iron or steel | 2½ cents per pound. | |
| Other tubes or pipes of wrought iron or steel | | |
| Chains not less than ¾ of an inch in diameter | 1 6-10 cents per pound. | 30 % ad valorem. |
| " less " " " " " | 1 8-10 cents per pound. | |
| " " " ⅜ " " " | 2⅞ cents per pound. | |
| Cross cut saws | 8 cents per linear foot. | 25 % ad valorem. |
| Mill, pit and drag saws: | | |
| Not over 9 inches wide | 10 cents per linear foot. | |
| Over 9 inches wide | 15 cents per linear foot. | |
| Circular saws | 30 per cent. | |
| Other saws | 40 per cent. | |
| Files: | | |
| 4 inches in length and under | 35 cents per dozen. | 35 % ad valorem. |
| Over 4 inches in length and under 9 inches | 75 cents per dozen. | |
| 9 inches in length and under 14 | $1.30 per dozen. | |
| 14 inches in length and over | $2 per dozen. | |
| Steel ingots, blooms, slabs, billets, &c.: | | |
| Valued at 1 cent per pound or less | 4-10 cent per pound. | 30 % ad valorem. |
| " above 1 cent and not above 1 4-10 cents per pound | 5-10 cent per pound. | |
| " " 1 4-10 cents " " 1 8-10 " " | 7-10 cent per pound. | |
| " " 2 1-10 " " " 2 2-10 " " | 9-10 cent per pound. | |
| " " 2 2-10 " " " 3 " " | 1 2-10 cents per pound. | |
| " " 3 " " " 4 " " | 1 6-10 cents per pound. | |
| " " 4 " " " 7 " " | 2 cents per pound. | |
| " " 7 " " " 10 " " | 2 8-10 cents per pound. | |
| " " 10 " " " 13 " " | 3½ cents per pound. | |
| " " 13 " " " 16 " " | 4 2-10 cents per pound. | |
| " " 16 " per pound | 7 cents per pound. | |

| Articles. | Present Duties. | Proposed Duties. |
|---|---|---|
| Steel circular saw plates | 1 cent per pound extra on above rates for saw plates. | 30 % ad valorem. |
| Steel or iron wheels, and iron or steel tires for railway purposes | 1¼ to 2½ cents per pound. | 35 % ad valorem. |
| Iron or steel wire rods : | | |
| Not smaller than No. 6 wire gauge | 6-10 cent per pound. | |
| Smaller than No. 6 to be classified as wire | | |
| Wood screws : | | |
| More than 2 inches in length | 5 cents per pound. | |
| Over 1 inch and not more than 2 inches in length | 7 cents per pound. | |
| " ½ " " " 1 " " | 10 cents per pound. | |
| ½ inch and less in length | 14 cents per pound. | |
| Iron wire : | | |
| Not smaller than No. 10 wire gauge | 1¼ cents per pound. | |
| Smaller than No. 10 and not smaller than No. 16 wire gauge | 1¾ cents per pound. | |
| " " 16 " " " 26 " | 2¼ cents per pound. | |
| " " 26 wire gauge | | |
| Steel wire | 45 cents per pound. | |
| Not smaller than No. 10 wire gauge | 1¼ cents per pound. | |
| Smaller than No. 10 and not smaller than No. 16 wire gauge | 1¾ cents per pound. | |
| " " 16 " " " 26 " | 2½ cents per pound. | |
| " " 26 | 3 cents per pound. | |
| Wire of iron, covered with cotton, silk, or other material, and wire commonly known as crinoline, corset and hat wire | 5 cents per pound. | |
| Wire of steel, covered : | | |
| Not smaller than No. 10 wire gauge | 5 cents per pound. | |
| Smaller than No. 10 and not smaller than No. 16 wire gauge | | |
| " " 16 " " " 26 " | | |
| " " 26 wire gauge | | |
| Iron wire, galvanized : | | |
| Not smaller than No. 10 wire gauge | 1¾ cents per pound. | |
| Smaller than No. 10 and not smaller than No. 16 wire gauge | 2¼ cents per pound. | |
| " " 16 " " " 26 " | 2¾ cents per pound. | |
| " " 26 wire gauge | 3½ cents per pound. | 30 % ad valorem. |
| Steel wire, galvanized | 45 per cent. | |
| Not smaller than No. 10 wire gauge | 1¾ cents per pound. | |
| Smaller than No. 10 and not smaller than No. 16 wire gauge | 2¼ cents per pound. | |
| " " 16 " " " 26 " | 2¾ cents per pound. | |
| " " 26 wire gauge | 3½ cents per pound. | |
| Wire rope and wire strand, made of iron wire: | | |
| Not smaller than No. 10 wire gauge | 2¼ cents per pound. | |
| Smaller than No. 10 and not smaller than No. 16 wire gauge | 2¾ cents per pound. | |
| " " 16 " " " 26 " | 3¼ cents per pound. | |
| " " 26 wire gauge | 4 cents per pound. | |
| Galvanized | 3¾ cents per pound.<br>4½ cents per pound. | |
| Made of steel wire: | | |
| Not smaller than No. 10 wire gauge | 3¼ cents per pound. | |
| Smaller than No. 10 and not smaller than No. 16 wire gauge | 3¾ cents per pound. | |
| " " 16 " " " 26 " | 4¼ cents per pound. | |
| " " 26 wire gauge | 5 cents per pound. | |
| Galvanized | 4¼ cents per pound. | |
| Wire cloth and wire nettings, made in meshes of any form, of iron or steel wire: | | |
| Not smaller than No. 10 wire gauge | 3¼ cents per pound. | |
| Smaller than No. 10 and not smaller than No. 16 wire gauge | 3¾ cents per pound. | |
| " " 16 " " " 26 " | 4¼ cents per pound. | |
| " " 26 wire gauge | 5 cents per pound. | |
| Galvanized: | | |
| Not smaller than No. 10 wire gauge | 4¼ cents per pound. | |
| Smaller than No. 10 and not smaller than No. 16 wire gauge | 4¾ cents per pound. | |
| " " 16 " " " 26 " | 5 cents per pound. | |
| " " 26 wire gauge | 50 cents per pound. | |
| Pocket knives: | | |
| Valued at not more than 60 cents per dozen | 12 cents per dozen and 50 %. | |
| " at more than 60 cents and not exceeding $1.50 per dozen | 50 cents per dozen and 50 %. | Valued at not more than 60 cts. per dozen, 35 %; above, 45 %. |
| " " " $1.50 " " $3 " | $1 per dozen and 50 %. | |
| " " " $3 per dozen | $2 per dozen and 50 %. | |
| Razors: | | |
| Valued at less than $4 per dozen | $1 per dozen and 30 %. | |
| " " $4 or more | $1.75 per dozen and 30 %. | |
| Swords, sword blades, and side arms | 35 per cent. | |
| Table knives, &c.: | | |
| Valued at not more than $1 per dozen | 10 cents per dozen and 30 %. | |
| " at more than $1 and not more than $2 per dozen | 35 cents per dozen and 30 %. | |
| " " " $2 " " $3 " | 40 cents per dozen and 30 %. | |
| " " " $3 " " $8 " | $1 per dozen and 30 %. | 35 % ad valorem. |
| " " " $8 per dozen | $2 per dozen and 30 %. | |
| Carving, &c.: | | |
| Valued at not more than $4 per dozen pieces | $1 per dozen and 30 %. | |
| " at more than $5 and not more than $8 per dozen pieces | $2 per dozen and 30 %. | |
| " " " $8 " $12 " " | $3 per dozen and 30 %. | |
| " " " $12 per dozen pieces | $5 per dozen and 30 %. | |
| Steel not specially enumerated | | |
| Cutlery not specially enumerated | | |
| Hollow ware, coated, glazed or tinned | 3 cents per pound. | 30 % ad valorem. |
| Manufactures of iron or steel, not specially enumerated | 45 per cent. | 35 % ad valorem. |

## OBITUARY.

STEPHEN WILCOX.

Stephen Wilcox, vice president of the Babcock & Wilcox Company, New York and Glasgow, died November 27 at his residence, 298 Washington avenue, Brooklyn, N. Y., aged 63 years. The cause of his death was pneumonia. Mr. Wilcox was one of the founders of the Babcock & Wilcox Company, whose business was established in 1868.

SYLVESTER PHINEAS PIERCE.

Sylvester Phineas Pierce, president of the Pierce, Butler & Pierce Mfg. Company and S. P. Pierce, Sons & Co., Syracuse, N. Y., died on November 5, aged 79 years. Mr. Pierce was born in the little hamlet of Sanquoit, Oneida County, N. Y., on September 19, 1814. The success and position in the trade of the concerns with which he was so long connected were largely due to Mr. Pierce's exceptional business sagacity and steadfast integrity.

F. J. V. Skiff, chief of the Mines and Mining Department of the World's Fair, is conspicuously mentioned in connection with the directorship of the Columbian Museum, now being put in shape by the citizens of Chicago. Mr. Skiff's eminent fitness for such a position seems to be firmly established by his achievements in the Mines and Mining Department of the late exposition. He not only carved out a new field hitherto unknown in universal expositions, but made it a shining success, showing great ability as an organizer and decided executive force.

The Ste. Etienne Steel Works Company, Ste. Etienne, France, have taken up the manufacture of armor plates by the Harvey process.

# MANUFACTURING.

### Iron and Steel.

The appraisers of the Wellman Iron & Steel Company, who are now in the hands of a receiver, made their final report on November 22. The appraisers find that the assets of the company reach the total of $1,216,052.13, which is divided as follows: Real estate, including permanent machinery, $940,111.43; personal property and chattels, $163,559.46; book accounts receivable, $107,213.74; bills receivable, $5067.50; stock, $100.

The Sanders & Thompson magnetic ore separator is undergoing trial at the Lebanon Valley furnace plant of J. & R. Meily, Lebanon, Pa.

The blast furnace of Isaac McHose & Sons, at Norristown, Pa., will shut down for an indefinite period, it is stated, after working up the stock now on hand.

The Irondale Rolling Mills, at Anderson, Ind., which burned recently, will probably not be rebuilt there. Indiana papers report that the offer made by Middletown, Ind., in the next county to that in which Anderson is located, has been accepted. The rolling mill company are to take $10,000 in lots, and get in addition to this $40,000. They agree to erect a plant that will employ 400 men. Thirty days will be given in which the money is to be paid over.

Kirkpatrick & Co., Limited, proprietors of the Leechburg, Pa., Iron Works, obtained an injunction restraining members of the Amalgamated Association from trespassing on or tampering with their property at the iron works there, or molesting non-union employees in their mills.

The Shenango Valley Steel Company have leased the Raney & Berger Furnace, at New Castle, Pa., for a limited period, and will, it is stated, start it up at an early date. The stack is now being put in working shape.

The puddling department of the Elmira, N. Y., Rolling Mills completed its first week since reopening on November 18. The iron which has been turned out is pronounced to be first class. Two more furnaces were fired November 20, which makes six furnaces in operation, all of which are manned by puddlers who were engaged in the mill before the strike of three years ago. It is quite probable that from present indications a large majority of the furnaces in the puddling mill will be working before the holidays.

The Linden Steel Company of Pittsburgh, Pa., are attracting special attention to their Linden patent steel floor plate, and particularly for its use for runner boards on locomotives, for which purpose it is being largely adopted, and for engine and fire rooms and steps of steam vessels. The plates are said to be very much superior to cast plates for general use wherever roughened surfaces are required on walks or places likely to be slippery or subject to much wear. Should they bend they can be easily straightened, and are, moreover, much easier to fit and lay down. The plates are made in weights from 10 to 22½ pounds per square foot, and in size as large as 40 x 96 inches.

The Excelsior Furnace, at Ishpeming, Mich., is to be put in blast as soon as the plant can be repaired. It is a charcoal furnace.

William Chambers, superintendent of the Anderson Steel Casting Company, Anderson, Ind., has asked the court to appoint a receiver for that company.

Blast furnace No. 6 of the Cambria Iron Company, Johnstown, Pa., has resumed.

In a circular letter which they are issuing to the trade, the Carbon Steel Company of Pittsburgh, Pa., call attention to the fact that they are the largest producers in this country of acid open hearth steel boiler, ship, bridge and tank plates. The standard of quality of this material is well testified to by the large amounts consumed annually in the construction of United States war ships, including the boilers for the same. The circular letter in question is accompanied by a reference card showing the different sizes of sheets and plates manufactured by the company, and by a neat nickel steel paper cutter, stamped with the name of the company.

A statement has at last been made of the indebtedness of Forsyth, Hyde & Co., the Chicago pig iron merchants, who failed early in the summer. It was filed in the County Court of Cook County last week, by E. Louis Kuhns, assignee of the firm, and shows liabilities of $529,804.41. Of this amount, $297,922 is for general or direct indebtedness, $231,120 for indorsements, $761 for labor performed. The heaviest holder is the Chemical National Bank of Chicago, with $134,311 general and $96,237 contingent. The First National Bank of Fond du Lac, Wis., holds a contingent claim of $55,149.39 and William Deering & Co. a direct claim of $30,488. These are largely on notes. The York Iron Company hold an account of $34,543 against the insolvents, while the Commercial National Bank of Milwaukee wants $20,478 on a note. The assets in sight are sufficient to realize probably 30 cents on the dollar, but they are clouded by other claims which may practically wipe them out.

The Milwaukee works of the Illinois Steel Company were on Monday put in full operation in all departments except the blast furnaces. This is the first time since last June that the entire rolling mill plant has been in operation. There is much rejoicing among the workmen who have so long been idle.

The Clark & Windsor Wire & Spring Company of Joliet, Ill., have gone into bankruptcy after an ineffectual struggle to maintain an existence. An execution was filed against the company on the 18th inst. for $23,800 by the Illinois Steel Company, and another for $15,100 by H. S. Smith. These claims do not cover the entire indebtedness, other creditors being interested. The Clark & Windsor Company were drawers of wire and makers of springs of various kinds. The business interests of Joliet have been hard hit during the depression now prevailing.

The Muncie Nail Works, at Muncie, Ind., have been leased by the Muncie Muck Bar Iron Company, a new corporation. The officers of the company are T. F. Rose, president; Joseph Porter, secretary and treasurer, and Michael Hanley, John Rockaway and W. J. Bowen, directors. The nail factory, it will be remembered, was burned down some time since and not rebuilt. Since then the mill has made muck bar exclusively.

The Globe Tin Plate Company have been incorporated at Chicago for the manufacture of tinned and terne plates. The incorporators are James Spruce, William Killmer and Henry C. Gager. A manufacturing plant will, it is stated, be erected at Hammond, Ind., at a cost of $32,000.

The assignee of the Linden Steel Company, Pittsburgh, Pa., has been discharged by order of court, and the plant is now in operation. The assignment, as generally known at the time, was made necessary to avoid attachment of foreign accounts while an extension was being arranged, which has been satisfactorily done. How full the works will run will depend on the condition of trade; at present only the blooming mill, one 10-inch mill, hammers and sheet mill making Linden patent steel floor plate are running.

### Machinery.

The Caldwell water tube boiler is now being manufactured for the West by the Link Belt Machinery Company, Chicago, with sales agencies in the principal cities.

Riehlé Bros. Testing Machine Company of Philadelphia have just closed a contract with Chas. F. McKenna of New York for an outfit of testing machinery for a new physical testing laboratory he is equipping at 221 Pearl street, New York City. The outfit will consist of a vertical screw power testing machine, with electric automatic beam and card appliance, and United States standard cement testing machine of 2000 pounds capacity, with worm gear attachment and all necessary appliances for exhaustive tests of cement. Riehlé Bros. Testing Machine Company have also furnished to the Department of Public Works of the city of Peoria, Ill., testing machines for a physical laboratory they are establishing for the purpose of testing all materials used by the city in its public improvements.

The compressors furnished to the Brazilian Government for furnishing air at 3000 pounds pressure for the dynamite gun on the steamer "El Cid," or "Nictheroy," were built by the Rand Drill Company.

The Reeves Pulley Company, Columbus, Ind., have perfected arrangements with the management of the Columbian Exposition Museum whereby their mammoth pulley will be removed from Machinery Hall and placed on permanent exposition in the museum.

A. D. Quint of Hartford, Conn., sold his entire collection of turret drills exhibited at the World's Fair to the Danville Foundry & Machine Company of Danville, Ill. He recently shipped a drill arranged for tapping, with cone countershaft, to Russia, and also one to Sweden.

It is reported that capitalists have purchased ground near Rockford, Ill., on which they propose to erect buildings for the manufacture of Corliss engines.

The Walburn-Swenson Company of Chicago Heights, Ill., have received a large order for machinery from Claus Spreckels to be used in the manufacture of sugar in the Hawaiian Islands. Since then other orders for machinery have come to hand from Mexico and Java. They have also received an order for paper machinery from Massachusetts. They have recently been obliged to add 75 men to their force. This report is in agreeable contrast to the gloomy reports coming from so many industrial establishments.

The Indiana Car & Foundry Company of Indianapolis, Ind., have secured some contracts for cars, and will put their works in operation in December after several months' idleness The foundry will start up at once. It is hoped that other orders can be obtained to keep the plant running steadily from this time.

Berghaefer & Lupinski, machinists, 967 to 973 North Water street, Milwaukee, made an assignment on the 24th inst. to J. Roemer. Liabilities are $33,000 and assets are put at $55,000. The assignee believes the assignment will be but temporary.

The Thomson Electric Welding Company have issued a circular announcing that their Boston offices have been removed to their works at Lynn, Mass., where all correspondence should hereafter be sent.

A fire originating in the casting room of the Ohio Brass & Iron Mfg. Company, Cleveland, Ohio, caused the complete destruction of the plant. It was insured for $23,500.

F. A. Thomas & Co.'s foundry, at Woonsocket, R. I., has been burned. Loss, $3000; insured.

W. G. & G. W. Lavers, steel die manufacturers of Boston, have decided to erect a factory at Brockton, Mass.

The Lever Engine Company, capitalized at $18,000, have filed articles of incorporation in New Jersey. The concern will build engines at Newark, N. J., and Corry, Pa.

The Bell Bearing Car Wheel & Mfg. Company of Cleveland, Ohio, capital stock, $50,000, have been organized for manufacturing car wheels, rolling stock, machinery and conveying apparatus.

The Hagerstown, Md., Steam Engine & Machine Company have closed their works for an indefinite period.

A temporary lessening of the force at the works of the Altoona Mfg. Company, Altoona, Pa., gave rise to the rumor that the plant had closed down.

### Hardware.

Owing to the growth of their business the Wyeth Hardware & Mfg. Company, St. Joseph, Mo., will consolidate their manufacturing departments at 302 to 308 North Second street, using the old premises on Third street for storage purposes.

The nail factory of the Pottstown Iron Company, Pottstown, Pa., which has been lying idle for some months past, resumed work on the 13th inst., 20 machines being put in running order A few more machines have since been put in operation.

The handle finishers employed in the Goodell Company's works, at Antrim, N. H., refused to accept a reduction in wages and struck on the 16th inst.

At a meeting of the stockholders of the Stover Mfg. Company, Freeport, Ill., on the 21st inst., the capital stock was increased from $100,000 to $250,000, $50,000 of which will be preferred stock and will be put on the market. The plant has been greatly enlarged during the past few years, as has also been the territory covered by the products of the company, and it was therefore thought desirable to also increase the capital stock. The company were started 12 years ago with a capital of $20,000. With the increase in capital the company will manufacture on a more extensive scale, and new buildings will soon be added to their already large plant.

The plant of the Birmingham Hardware Specialty Company of Birmingham, Ala., which has been idle for four or five months, will soon start up again, giving employment to 25 or 30 men.

The Grand Rapids Refrigerator Company, Grand Rapids, Mich., in a neatly gotten up circular to the trade state that their factory is and has been running full time, ten hours a day, six days a week. The company suggest that the trade send in their orders early so that they can make up the identical sizes desired. Last season, they explain, they were caught with a large stock of the wrong sizes on hand, which they refer to as having been unsatisfactory to themselves and their customers. Reference is also made to the fact that the company were awarded three medals and a special diploma at the World's Fair for the excellence of their refrigerators.

S. B. Husselman of Worcester, Ohio, has purchased the entire interests of J. H. Logan, Geo. B. Logan and Edward P. Logan of Pittsburgh in the Logan & Strobridge Iron Company, New Brighton, Pa., and also the interest of J. H. Logan in the old New Brighton Cutlery Building Association, the building of the latter being now occupied by the Robinson Mfg. Company. The interests purchased by Mr. Husselman are thought to be worth $50,000. With the advent of Mr. Husselman the Logan & Strobridge Iron Company will in addition to coffee, corn and spice mills, builders' and house furnishing hardware, light gray iron castings, &c., manufacture railroad, farm and yard fencing under the Husselman patents. The company at present employ about 100 men, which force will be increased when the fence trade opens in the spring. There will be no change in the management of the company except that Mr. Husselman will take the place of J. H. Logan as director.

The Union Mfg. & Plating Company, Freeport, Ill., manufacturers of hardware specialties, &c., now have their new factory under cover, and will be in running order again about December 1.

The Everett Nail Works, at Everett, Wash., are to resume operations on December 1.

M. V. Root of Maquoketa, Iowa, is organizing a stock company for the manufacture of hardware specialties.

The Vienna Stamping & Enamel Works, at Porter, Ind., whose proprietors failed during the summer, have been sold to new parties. Arrangements are being made to resume manufacturing operations.

The Alaska Refrigerator Company of Muskegon, Mich., started work in their factory on the 23d inst., after an idleness of four months. This is claimed to be the largest plant of its kind in the world, and the resumption of work gives employment to a great many hands.

The New England Screw Company, Boston, Mass., advise us that they are running to their full capacity with good orders ahead. The company will soon engage in the manufacture of a line of brass work, including socket and lamp base shells, &c.

The Arcade File Works of Anderson, Ind., have recently closed a contract for an electric light plant with a capacity of 500 16 candle-power incandescent lights. They are still engaged in adding to their plant a large number of the improved machines invented recently by Alfred Weed, vice president and general manager of the works.

At the works of the H. M. Myers Company, Beaver Falls, Pa., manufacturers of shovels, spades and scoops, copies of the following notice were posted last week: "Owing to a lack of orders and the uncertainty as to the future, we have decided to pay all our employees in full to December 1, and set them free to make the best arrangements or change in any direction they can for themselves. When we start again on steady run, whether it be sooner or later, necessity compels us to revise our prices now paid for labor, on account of the extremely low prices at which shovels are now being offered and sold in the market; consequently, when we resume work it will be necessary for all who wish employment to call at the office."

The plant of the Consolidated Steel & Wire Company, at Braddock, Pa., with offices in the Westinghouse Building, Pittsburgh, is now being operated double turn in every department.

# TRADE REPORT

The shock which the Iron trade has received through the publication of the Wilson tariff bill has staggered even those who were ready to admit that the industry could stand a conservative readjustment of rates. It has startled them out of their fancied security. We print editorially figures which illustrate the savage cuts made.

The belief is gaining ground, however, that the bill has no chance of passing as at present framed, because it attacks indiscriminately interests in sections of the country whose loyalty to the framers of the bill must be retained to carry it through.

The immediate effect upon business cannot help being bad. The early date named for its going into effect must act to deter buyers from covering spring and summer requirements. It seems likely to confirm purchasers all along the line in a policy of keeping supplies down to the minimum.

In spite of denials made it is true that a new combination of the Rail mills has been formed, the arrangement being that the Maryland and Pennsylvania companies shall not make Rails for steam roads. We should state, however, that the former company will not discontinue making Steel Billets, as stated by us, and that the latter go on making all their specialties, contrary to the interpretation put upon our report by writers in the daily press. A well informed writer in the New York *Sun* intimates that it was the Pittsburgh mill which sued for peace after the short but sharp war. It is reported that the Eastern campaign of the Western mill led to the capture of only one small order, and that a flank movement was made into its own territory. The report quietly circulated that two of the Eastern mills are not in the new arrangement is without foundation.

A heroic effort is being made on the part of some of the Southern furnaces to advance the price of Pig Iron. The chief basis for this standing out for more money seems to be that considerable sales have been made lately, and that they include speculative purchases. Whether this advance will be actually secured depends upon whether other producers in the South and in Northern districts will see fit to cover the current demand at old prices. As yet no serious disposition has been shown to follow the leadership of the large companies in question.

Some very low sales of Bessemer Pig have taken place in the valleys, the Iron having been carried for some time past.

Good lots of Steel Billets are openly selling in Pittsburgh at $17, and the announcement that Edgar Thomson has started on this class of material is giving rise to some uneasiness. Eastern Pennsylvania makers are meeting Western prices, but are confronted with a market swept pretty bare of orders. Some good orders have been placed in the Chicago district.

## Chicago.

*(By Telegraph.)*

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, November 29, 1893.

The local Iron market continues in the same condition of hesitancy that has characterized it for some time. It is true that in some lines there has been a gradual progress toward a large volume of business, but this has by no means brought the trade up to its usual standard. The promulgation of the new tariff bill has projected another uncertain element into the situation, and general apprehension is felt of a decline in values all along the line. The reductions proposed are greater than had been anticipated, and all calculations are at sea. Even at this early day cancellations of orders have begun by buyers, who now fear the future.

**Pig Iron.**—The most important occurrence during the week is the effort of some large Southern companies to put a check to the demoralization in prices by actually asking an advance, which amounts to about 50¢ ℔ ton on the grades most sold in this market. They decided to take the bull by the horns and see if it was not possible to put the market in better condition by such action. The consequence is that for the past few days some search has been required to find sellers willing to make the low prices heretofore current. On Southern Iron the general situation has been improving for several weeks past. Quite a number of foundries making specialties are getting ready to start in December, while general jobbing foundries are almost all again in operation, although working only part time or with part of their force. Nothing new is reported in local Coke, but taking a survey of the month, sales agents find that there has been a steady improvement in the demand from the beginning to the close. It is hoped that this will continue, although some fear is expressed that December and January, which are usually dull months, may cause something of a relapse. Quotations are now as follows for cash:

| | | |
|---|---|---|
| Lake Superior Charcoal..... | $15.50 @ | $16.00 |
| Local Coke Foundry, No. 1... | 13.50 @ | 14.00 |
| Local Coke Foundry, No. 2... | 12.75 @ | 13.00 |
| Local Coke Foundry, No. 3... | 12.25 @ | 12.75 |
| Local Scotch..... .... | 14.00 @ | 14.50 |
| Ohio Strong Softeners No. 1.. | 15.50 @ | 16.00 |
| Southern Silvery, No. 1. ... . | @ | 13.75 |
| Southern Silvery, No. 2..... | @ | 13.25 |
| Southern Coke, No. 2..... ... | 11.85 @ | 12.10 |
| Southern Coke, No. 3..... | 11.10 @ | 11.35 |
| Southern, No. 1, Soft..... | 11.85 @ | 12.10 |
| Southern, No. 2, Soft..... | 11.10 @ | 11.35 |
| Tennessee Charcoal, No. 1... | 16.00 @ | 16.50 |
| Southern Gray Forge..... .... | 10.60 @ | 10.85 |
| Alabama Car Wheel..... | 18.25 @ | 18.50 |
| Jackson County Silvery..... | 16.00 @ | 16.50 |
| Other Ohio Silvery..... | 15.00 @ | 15.50 |

**Bars.**—While a number of manufacturers report their trade somewhat smaller than it has been, a number of others make statements of a much more encouraging character, having had better trade and received more inquiries during the past week than in any week for the previous two months. So many more mills are now running, however, that even if business is greater it is spread over more ground, and may therefore seem less active to some manufacturers who were steadily running during September and October. The movement toward the substitution of Steel for Iron is more pronounced than ever. Consumers who were prejudiced in favor of Iron have now abandoned it, and are taking Steel. Some who had placed large season contracts with the option to make Steel or Iron are taking Steel exclusively. Mill shipments of Bar Iron are quoted at 1.35¢ @ 1.40¢ Chicago, from near by mills, while the

Valley mills are endeavoring to maintain 1.45¢, and report some business at that figure. Soft Steel Bars are selling at 1.45¢ @ 1.55¢, Chicago, according to the character of the order. Jobbers are in receipt of continued good business from both large and small consumers, and report prices for small lots from stock 1.60¢ @ 1.70¢ for Bar Iron and 1.65¢ @ 1.75¢ for Soft Steel Bars.

**Structural Material.**—The Milwaukee viaduct on which bids are to be opened on December 1 will show where prices are in this section. Some other good contracts for bridge material have recently been placed, among which was one for 1500 to 2000 tons, all of Iron, which is an unusual thing. The building trade is quiet. Quotations are as follows, Chicago delivery: Beams, 1.65¢ @ 1.75¢; Tees, 1.90¢ @ 2¢; Angles and Universal Plates, 1.60¢ @ 1.65¢. Small lots are sold from stock at an advance of 10¢ @ 15¢ ℔ 100 above these prices.

**Plates.**—The demand for mill shipments has been very light. Dealers also report a very quiet business on orders from stock. Mill shipments, Chicago delivery, are quoted as follows: Tank Steel, 1.60¢ @ 1.70¢; Shell Steel, 1.80¢ @ 1 90¢; Flange Steel, 2¢ @ 2.10¢; Fire Box, 2.75¢ @ 5¢. Store prices now prevail as follows: Iron or Steel Sheets, Nos. 10 to 14, 2.25¢ @ 2.40¢; Tank Steel, 2.10¢ @ 2.20¢; Shell Steel, 2 20¢ @ 2 40¢; Flange Steel, 2 50¢ @ 2.65¢; Boiler Tubes, 70 and 5 % off.

**Sheets.**—Black Sheets are almost entirely neglected, jobbers and consumers evidently having secured sufficient stock for some time to come. Carload lots of No. 27 Common are quoted at 2.70¢ @ 2 75¢, Chicago, while small lots are selling at 2.90¢ @ 3¢ from stock. Galvanized Iron is in exceptionally good demand at about 75 % off for Juniata on mill shipments; small lots are selling at 70 % @ 70 and 7½ %, according to quantity. Sheet Copper is unchanged at 30 % @ 35 % off, according to the size of the order.

**Merchant Steel.**—Quite a spurt has been observed in the increased number of specifications sent on season contracts. New business has also been fairly active. Prices are remarkably steady on this class of material. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery, Tire and Open Hearth Spring Steel, 1.90¢ @ 2¢; Ordinary Bessemer Machinery, 1 60¢ @ 1.65¢; Ordinary Bessemer Tire, 1.55¢ @ 1.60¢; Ordinary Tool Steel, 6¢ @ 7¢; Specials, 12¢ and upward.

**Billets.**—The sales for the past week have aggregated about 7000 tons. Quotations are continued at $19.25 @ $19.50, Joliet.

**Rails and Track Supplies.**—The railroads have not yet come into the market for their next year's tonnage of Steel Rails, and it is not definitely known when they will begin to place contracts, hence the past week has been very quiet; the price ranges from $25 upward, according to quantity. Very little business is reported in Fastenings, with quotations at 1.50¢ @ 1.60¢ for Splice Bars; 2.55¢ @ 2 60¢ for Track Bolts with Hexagon Nuts, and 1.90¢ @ 1.95¢ for Spikes.

**Old Rails and Car Wheels.**—Nothing has been done lately in Old Iron Rails, and quotations are nominally at $14; Old Steel Rails are held at $7.50 @ $10, according to length. Speculative interest in Old Car Wheels continues, with buyers naming $10.50 @ $11 as the price at which they would take in good sized lots. Nothing is doing with consumers.

**Scrap.**—The inquiry for Old Material is somewhat better and sales are reported of good quantities of Cast, Wrought and Malleable; even Steel is beinning to move again. Prices appear to have touched a point from which only slight fluctuations are made, and dealers think that present values are likely to hold for some time in the future. Quotations are maintained at old figures: No. 1 Forge, $10; No. 1 Mill, $8; Sheet Iron, $4.50; Pipes and Flues, $8; Axles, $16; Horseshoes, $11; Fish Plates, $12; Spikes and Bolts, $10; Cast Borings, $4.50; Wrought Turnings, $6.50; Axle Turnings, $8; Heavy Cast, $9 50; Stove Plate, $7.75; Malleable Cast, $8; Mixed Steel, $7, gross ton; Leaf Steel, $14 50.

**Metals.**—Copper is moving upward in consequence of the very heavy demand for export, which is now affecting the home market. Carload lots of Lake are quoted at 10⅝¢. A large inquiry is reported for casting brands, but manufacturers are not disposed to sell for forward delivery. The price for leading brands is unchanged at 9¾¢, but an advance is looked for at an early day. Spelter is unchanged at 3.55¢ for carload lots, with a good demand.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., November 28, 1893.

At the risk of being thought pessimistic or monotonous, it must be again stated that the situation in this vicinity shows no improvement. Repair work is beginning to be of some importance, but new contracts for large work are conspicuous by their absence. Taking everything into account, it may be said that there is no more work on hand today than there was a month ago, or two or three months ago, the incoming of new orders from week to week being fully offset by current deliveries; nevertheless there is a general feeling that the outlook is vastly improved. Liquidation has been pretty well completed, prices and stocks are at the lowest point possible, and as money is accumulating in large amounts, there appears to be absolutely nothing to prevent a return to normal conditions. This will come gradually, however, and there may yet be some delay in getting started; but there is an intuitive feeling that the acute stage has been passed, and that complete recovery is merely a question of time. Still, it is hardly to be supposed that anything important will be entered upon until the tariff agitation is settled, so that under the circumstances it will probably be well on toward spring before there is any very decided change from the conditions now ruling.

**Pig Iron.**—The demand is not specially urgent, but consumers are evidently so nearly out of stock that orders are frequent, if not large. It begins to look as though there will be a pretty active business after the turn of the year: 1, Because stocks are unusually low; 2, because requirements will probably be larger than they have been during the past six or eight months, and, 3, because if the two former theories are correct, prices will seem more attractive than they were when money was close and when consumers had some stock on hand, but very few orders coming in. Everything seems to shape for ultimate improvement, although at the moment there is no trouble in placing orders at the lowest figures of the entire year. There is no pressure to sell, however, and less chance for concessions than there was some time ago. General quotations for Philadelphia or near by deliveries are about as follows:

| | |
|---|---|
| No. 1 Foundry | $13.75 @ $14.25 |
| No. 2 Foundry | 13.00 @ 13.25 |
| Standard Gray Forge | 12.00 @ 12.50 |
| Ordinary Gray Forge | 11.50 @ 11.75 |

**Steel Billets.**—There is very little demand, and such as there is can be supplied at the lowest figures ever quoted. First-class buyers have placed orders for 1000-ton lots at $19 30, delivered, and can easily duplicate their purchases to-day, but there is nothing but small lots asked for, on which $19 75 @ $20 is asked and paid for a few carloads, or for 100 to 200 ton lots.

**Finished Material.** — Business has not attained anything like the proportions which after so many weeks of depression might reasonably be expected. In spots there is a little improvement, but it is so faint and so irregular that for all practical purposes mills are just about in the same condition as they have been for three months past. Under such circumstances it goes without saying that prices are weak and uncertain, and, in fact, hardly quotable, unless on specifications actually in hand. Western mills are competing at the low figures which they established some days ago, and some business is being taken, although those who look to quality and the permanency of their business are inclined to stick to their regular sources of supply rather than take risks elsewhere for the sake of a possible saving of a few cents ℔ 100 ℔ on a few temporary transactions. The demand is not large, however, small lots being the rule, and chiefly at prices about as follows:

| | | | |
|---|---|---|---|
| Grooved Skelp, delivered | 1.45¢ | @ | 1.50¢ |
| Best Refined Bars | 1.45¢ | @ | 1.55¢ |
| At interior points | 1.35¢ | @ | 1.40¢ |
| Tank Steel | 1.45¢ | @ | 1.55¢ |
| Heavy Plates | 1.50¢ | @ | 1.60¢ |
| Shell | 1.60¢ | @ | 1.75¢ |
| Flange | 1.90¢ | @ | 2.00¢ |
| Angles | 1.60¢ | @ | 1.70¢ |
| Beams and Channels | 1.75¢ | @ | 1.90¢ |

**Old Material.**—There is no special change in this department. The supply is large enough for all demands, so that prices are unchanged—a trifle higher, perhaps, on choice lots, but in ordinary cases buyers can get all the material they want within the following range of prices:

| | | | |
|---|---|---|---|
| No. 1 Wrought Scrap, delivered | $12.00 | @ | $13.00 |
| Machinery Cast, delivered | 10.00 | @ | 11.00 |
| Heavy Steel Scrap, delivered | 12.00 | @ | 13.00 |
| Old Iron Rails, delivered | 14.00 | @ | 14.50 |
| Old Street Rails, delivered | 15.50 | @ | 16.00 |
| Wrought Turnings, delivered | 10.00 | @ | 11.00 |
| Cast Borings, delivered | 6.00 | @ | 7.00 |
| No. 2 Light Scrap | 6.00 | @ | 7.00 |

Messrs. J. W. Hoffman & Co. of Philadelphia have removed their offices from Walnut street to the Bullitt Building, on Fourth street. Messrs. Hoffman & Co. have secured a ground floor front, and have one of the most prominent as well as one of the most central locations in the city for the interests with which this firm have been identified during the past 25 years. Messrs. Hoffman & Co. extend a cordial invitation to their friends to call and see them at their new address, Bullitt Building, Philadelphia.

## St. Louis.

(*By Telegraph.*)

Office of *The Iron Age*, Bank of Commerce Building, St. Louis, November 29, 1893.

**Pig Iron.** — There is no material change to note, either as regards price or the volume of trade. The general tone of the market is dull, occasioned somewhat by the position taken by consumers, in holding off shipments of Iron due. There are no "job lots" being offered just now, and sales are made on the basis of the following quotations, which are for cash, f.o.b. cars St. Louis:

| | |
|---|---|
| Southern Coke, No. 1 Foundry | $13.25 @ $13.50 |
| Southern Coke, No. 2 Foundry | 11.50 @ 11.75 |
| Southern Coke, No. 3 Foundry | 10.75 @ 11.00 |
| Southern Gray Forge | 10.25 @ 11.50 |
| Southern Car Wheel | 17.25 @ 18.25 |
| Lake Superior Car Wheel | 16.50 @ 17.00 |
| Ohio Softeners | 16.00 @ 16.50 |

**Bar Iron** —A fair trade is reported from store at 1.75¢. Mills are not busy, however, and inducements in the way of low prices fail to influence trade. Mills quote 1.45¢ for carload lots, half extras, f.o.b. cars East St. Louis.

**Barb Wire.**—There is only a moderate demand for Barb Wire. Mills quote Painted $2 @ $2.05, and Galvanized $2.40 @ $2.45. Jobbers ask $2.10 @ $2.15 for Painted, with 40¢ ℔ hundredweight additional for Galvanized.

**Wire Nails.**—Trade is light in this department, and rumors of extremely low prices are current. The usual mill price for carload lots to jobbers is $1.40, but this would doubtless be shaded for large quantities. Jobbers quote $1.45 @ $1.55, according to quantity.

**Rails and Track Supplies.**—Track Supplies continue in good demand, as follows: Splice Bars, 1.65¢ @ 1.70¢; Spikes, 2¢ @ 2.05¢; Bolts, Square Nuts, 2.50¢; with Hexagon Nuts, 2.60¢. Old Rails are offered at $14, but buyers are scarce and bids of $13.50 are the best that can be secured. Steel Rails are firmer in consequence of the new agreement making the price at Western works $25. Locally they are quoted at from $27 to $27.50.

**Pig Lead.**—There are no large offerings of this metal, and sales are limited to carload lots. At the close of the market to-day 3.15¢ was bid, while sellers ask 3.17½¢; the result is a narrow and uninteresting market.

**Spelter.**—This metal remains unchanged. The selling price is 3.40¢, but consumers refuse to pay this price.

## Cincinnati.

(*By Telegraph.*)

Office of *The Iron Age*, Fifth and Main Sts, Cincinnati, November 29, 1893.

The increase in the volume of business in Pig Iron keeps up well, and during the past week it was much larger than the preceding week, although the sales were smaller than three weeks ago; but what is more encouraging, an advance of 25¢ ℔ ton is asked and obtained for spot and early future delivery, and a still further advance would have to be paid for delivery next spring. The furnaces have recently sold more Pig Iron than they have made and there is a scarcity of the three grades most in demand. The prices current now for Gray Forge are $7.25; Mottled, $7; No. 3 Foundry, $7.75, and No. 2 Foundry, $8.25, f.o.b. Birmingham, and the tendency seems to be strongly upward. There is nothing doing in No. 1 Foundry, so it is merely nominal at the old rate. The sales the past week aggregate upward of 30,000 tons and embrace more liberal quantities for Eastern shipment, as well as fair quantities for consumption in this district. The better monetary outlook has evidently infused a feeling of confidence into the Iron trade in all of its branches. Money is easy for all business in good credit, and collections are again satisfactory. There is scareely any movement in Charcoal Iron. Quotations are as follows:

*Foundry.*

| | |
|---|---|
| Southern Coke, No. 1 | $12.25 @ $12.50 |
| Southern Coke, No. 2 | 11.00 @ 11.25 |
| Southern Coke, No. 3 | 10.50 @ 10.75 |
| Ohio Soft Stone Coal, No. 1 | 15.50 @ 16.00 |
| Ohio Soft Stone Coal, No. 2 | 14.50 @ 14.75 |
| Lake Superior Coke, No. 1 | 15.00 @ 15.25 |
| Lake Superior Coke, No. 2 | 14.00 @ 14.25 |
| Hanging Rock Charcoal, No. 1 | 18.50 @ 19.00 |
| Hanging Rock Charcoal, No. 2 | 17.50 @ 18.00 |
| Tennessee Charcoal, No. 1 | 14.00 @ 14.25 |
| Tennessee Charcoal, No. 2 | 13.00 @ 13.25 |

*Car Wheel and Malleable Irons.*

| | |
|---|---|
| Standard Southern Car Wheel | 17.75 @ 18.00 |
| Lake Superior Car Wheel and Malleable | 17.00 @ 17.25 |

*Forge.*

| | |
|---|---|
| Gray Forge | 10.00 @ 10.50 |
| Mottled Coke | 9.75 @ 10.00 |

## Pittsburgh.

(*By Mail.*)

Office of *The Iron Age*, Hamilton Building, Pittsburgh, November 28, 1893.

Within the past week two events have occurred, both of which are expected to add to the demoralization which has prevailed in the Iron and Steel trades for so long. The first of these was the announcement that the Rail makers had made a new agreement by which the Rail making industry would be controlled by five concerns. The second was the making public of the new Tariff bill by the Ways and Means Committee. The radical reductions in the tariff proposed by this bill will undoubtedly be contested by manufacturers whose interests it affects, and while this contest is being waged business must suffer, and undoubtedly will suffer, by reason of the uncertainty existing as to what reductions will finally be made. Interviews with a few of the leading Pittsburgh manufacturers would indicate that they do not expect the bill to go through as originally drafted. A hard fight will be made against it, which will probably be prolonged for some months. Considerable criticism is expressed over the action of the committee in putting duties on an advalorem basis entirely, the claim being made that it opens the way for frauds upon the Government, which will be brought about by false invoicing, which specific duties make impossible. After sufficient time has elapsed to allow thorough consideration of the bill, we shall doubtless have expressions of opinions from affected industries, which will be difficult for those who will finally vote on the bill to ignore. It has been figured that 40% ad valorem duty on Tin Plates means about 1¢ ℔ lb, as Coke Plates can be bought in Swansea to-day for $2.50 ℔ box of 108 lb. Rails at 25 % ad valorem duty means about $4.25, based on the present selling price abroad, and if put through will allow foreign Rails to come in unless home makers establish a lower price. The placing of Cotton Ties on the free list will seriously affect some Pittsburgh and Mahoning Valley manufacturers, who are large makers of this product. After all, as one maker puts it, if the tariff is finally reduced to any great extent further reductions in wages sufficient to place us on a level with foreign manufacturers will have to be speedily made. We can compete in everything but labor, and if necessary to preserve our interests we can compete in that as well. The Iron and Steel trades present no new features this week. Business is no better, perhaps a little worse, while prices seem to be getting lower right along, particularly in Finished Materials. The expected revival in the demand for Rails has not come, and any improvement in the demand for Ore and Pig Iron from this source seems as far off as ever.

**Pig Iron.**—There has been no improvement in the market since our last report. Indeed, it would seem that prices are a shade weaker, due largely to recent sales of Valley Iron, owned by a Pittsburgh interest, at prices said to be much lower than any of the other makers here are willing to accept. Much of this Iron was bought when prices were from $2 to $3 per ton higher than at present, and the forcing of it on the market was accompanied by a heavy loss to the seller. An Ohio Valley concern is said to have bought a large block of this Iron. While it is true that more Pig Iron is being consumed now than at any time since July, it is also true that there has been a large increase in production, owing to the blowing in of stacks here and in the two valleys. The second furnace of the Monongahela Furnace Company, at McKeesport, Pa., has gone in and is making Bessemer for the new Steel plant. The Raney & Berger Iron Company, at New Castle, started up their furnace last week. As to prices, it can be said that Gray Forge is being held at $10.50, Pittsburgh, while Bessemer is offered at $11 for prompt shipment, although a number of furnaces, both here and in the Valley, are refusing to meet this price and are holding their Iron at $11.25 @ $11.50. We quote as follows:

| | | |
|---|---|---|
| Neutral Gray Forge | $10.50 @ ..... | cash |
| All-Ore Mill | 10.50 @ $10.75 | " |
| Bessemer | 11.00 @ 11.25 | " |
| No. 1 Foundry | 12.50 @ 13.00 | " |
| No. 2 Foundry | 11.50 @ 12.00 | " |

We note a sale of 1000 tons of Bessemer for December delivery at $11, Pittsburgh, and one of 1500 tons for December and January at $11.25, Pittsburgh. Also a sale of 1000 tons of Gray Forge for December and January at $10.50, delivered.

**Billets.**—The Steel market has shown no marked change during the week. There is a moderate amount of Steel changing hands, but as near as can be learned no contracts calling for large tonnage have recently been closed. However, it can be stated that as we get nearer the close of the year there is more disposition shown on the part of makers to sell into next year at present prices. For ordinary business mills continue to quote $17.25 @ $17.50, the first named being the ruling price. For desirable orders, with payments and deliveries satisfactory to makers, it is probable that such business could be placed at $17 at maker's mill. We note a sale of 5000 tons for delivery into March of next year at a price equal to about $17 at maker's mill; also a sale of 3000 tons for December, January and February at $17 at maker's mill; also a sale of 1000 tons for December and January at $17.25 at maker's mill. The new Bessemer plant of the National Tube Works Company, at McKeeaport, Pa., was started up this week. Every-

thing worked smoothly and in a manner highly satisfactory to both the builders and owners of the plant.

**Ferromanganese.** — We quote at $52 @ $52.50 for 80 % domestic and note a sale of 50 tons at a prices equal to about $52, delivered at buyer' mill.

**Muck Bars.**—There is little doing, owing to the low price at which Billets can be obtained. We quote best grades Muck Bars at $20.75 @ $21, delivered at buyer's mill. We note a sale of 250 tons for delivery at the first named price.

**Plates.** — The slightly improved demand noted last week continues. Prices are no better, but on the contrary are weak and lower. We quote: Tank Steel at 1.35¢ @ 1.40¢, and for round lots the lower quotation would be shaded. Flange Steel we quote at 1.65¢ @ 1.75¢; Shell, 1.55¢ @ 1 60¢; Fire Box, medium quality, 2½¢ @ 3¢, best quality, 3½¢ @ 4¢.

**Steel Rails.**—The Edgar Thomson mill was off last week, but will start up again in a few days on Rails. Reports that the local mill had captured a number of large orders, one of them amounting to 40,000 tons, for the Lake Shore Railroad, have not been confirmed. It is understood during this week the final papers of the new agreement between the Rail makers will be adjusted.

**Structural Material.**—The demand for Beams has kept up remarkably well this month, due, no doubt, to the mild weather, which has permitted building operations to go on without interruption. Pittsburgh has recently taken two Government contracts which called for a good sized tonnage of Beams. For ordinary lots we quote Beams up to 15 inches, 1.50¢ @ 1.60¢. For desirable orders our lower quotation would be shaded. We quote Angles and Universal Plates, 1.50¢ @ 1.60¢; Tees, 1.70¢ @ 1.75¢. Makers here are looking for a very heavy demand for Structural Material next year should a revival of business come in spring, which is confidently anticipated.

**Bars.**—A general resumption of operations among the valley mills has taken place, and this will highten the struggle for work which has been going on for some time. As a direct consequence of the starting up of additional mills prices have shown a weaker tendency, although no material decline has taken place. We continute to quote Soft Steel Bars at 1.35¢ @ 1.40¢, with Bar Iron extras, Pittsburgh. For good round lots it is probable that a lower price than we have named would be accepted. The valley mills are holding Bars at 1.30¢, and it is claimed it is exceedingly hard to shade this price even to slight extent.

**Barb Wire.**—There is no improvement in demand, and prices have recently shown a weaker tendency. We quote Four-Point Galvanized at $2.20 in carload lots at mill, with the usual advance for less quantities. For round lots this price would probably be slightly shaded. Plain Wire is in moderate demand, and we quote at $1.45 in carload lots for Nos. 6 to 9. For a fair sized order this price would be shaded.

**Wire Nails.**—Although there is an active demand for Wire Nails, the fact that all the mills are in operation causes considerable competition for business, and as a result prices are slightly weaker. We quote Wire Nails in carload lots at $1.15 @ $1.20. Small lots are held at $1.30 @ $1.35. There is also a good demand for Cut Nails, but in sympathy with Wire Nails prices have shown a weaker tendency. We quote at 95¢ @ $1, at mill, for the usual averages.

**Wire Rods.**—There has been an active demand for Rods for some time and some of the mills have their entire output for the balance of the year under contract. On account of the low price of Steel, Rods for delivery during the first quarter of next year are offered at $24.75 @ $25, at maker's mill. Under very desirable conditions it is possible that our first named quotation would be slightly shaded.

**Merchant Steel.**—There is nothing of interest to report this week. The demand continues only fair, and considerable disappointment is being expressed by mills on account of the slow manner in which new business is developing. A part of the plant of the Linden Steel Company, in this city, has been put in operation, the firm having made satisfactory arrangements with their creditors and secured an extension of five years. Prices are unchanged, and we continue to quote Open Hearth Tire Steel at 1.90¢ @ 2¢; Bessemer Machinery at 1.55¢ @ 1.65¢; Toe Calk, 2¢ @ 2.10¢; Tool Steel, from 5½¢ upward, according to quality.

**Skelp Iron.**—The demand for Skelp Iron is slightly better, owing to the starting up of some two or three plants that had practically done nothing for some months. Prices continue very low, and we quote Grooved Skelp at 1.37¢ @ 1.50¢, and Sheared at 1.50¢ @ 1.60¢, the price depending largely on the nature of the order.

**Pipes and Tubes.**—There is nothing of interest to report this week. The demand is only moderate, and the prospects for an improvement in this direction before next year are not very promising. No attention has been paid to the official discount list for some months.

**Coke.**—Within the past week or so a number of contracts for Furnace Coke for delivery up to July 1, 1894, have been closed, these contracts being based on $1.10 in tons of 2000 lb on board cars in Connellsville region. As near as can be learned this price has not been shaded, and there is a disposition among Coke makers not to make contracts for their entire output, for the reason that better prices for Coke are expected after the first of the year on account of the increased demand brought about by the blowing in of a number of furnaces. For the week ending November 18 there were 7180 ovens in the Connellsville region in blast and 10,339 idle, with a total estimated production of 66,090 tons. Compared with the previous week there was a net gain of 695 active ovens and an increase in production of 8235 tons. We continue to quote Furnace Coke at $1.10 in tons of 2000 lb, f.o.b. cars in Connellsville region, and Foundry Coke is held at $1.50 to dealers and $1.65 to consumers.

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The collieries of British India produced, in 1892, 2,537,696 tons of coal, or almost exactly double the amount put out in 1883. During the interval the number of collieries has increased from 61 to 88. The industry is stated to have received quite a decided impetus of late from the widespread demand that India should be self supporting in her fuel supplies, as well as from recent railroad extensions which have brought some of the coal mines into easier communication with the cities.

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# Metal Market.

**Copper.**—No large sales of Lake Superior Ingot have been reported or even rumored, but brokers have been supplied with orders to bid stiff prices, not only on Exchange contracts, but on actual Copper for near future delivery. In some quarters it was claimed that 5,000,000 lb or any part would have been taken at 10¢. Elsewhere *bona fide* bids of 10⅛¢ for moderate quantities were turned down. On the Metal Exchange a trade was recorded involving 50,000 lb, for delivery during the latter part of December, at 10⅛¢, but reliable information went to show that several prominent producers were willing and ready sellers at that rate for delivery during the first quarter of next year. There is some suggestion of manipulation, or at least a tendency to make the most of all the best features prevailing, but enough legitimate demand prevails to give the market good tone. In the cheaper varieties hardly the same degree of interest is manifested, but sales are sufficient to keep the market in quite good form. The range of prices quoted is 9⅛¢ @ 9¾¢ for Electrolytic and 9¼¢ @ 9½¢ for casting stock, according to brand and quantity.

**Pig Tin.**—For spot stock and on deliveries running during the balance of the year, prices have been well maintained on the basis of about 20.65¢. Speculation has remained almost at a standstill, and regular operators, as well as outside interest, seem to have virtually withdrawn pending the fate of the new tariff bill. The jobbing and consumptive demand has also been on a moderate scale, but the best information on the subject goes to show that steady inroads have been made upon spot stocks, and that the distribution exceeds the combined total quantity afloat and the importations since the McKinley duty went into effect. Along with the fact that stocks in Europe have been steadily increasing this would suggest more than a bare possibility of some lively speculative movement in the event of the present duty being removed. At the close the market was apparently steady in tone but very quiet.

**Pig Lead** —There has been somewhat freer offering, due partly to slow condition of trade latterly and partly to some uneasiness over the provisions of the new tariff bill. Under the weight of the two circumstances selling price has dropped to 3.40¢. Carload and larger lots have been offered at that rate for delivery up to the balance of the year. At the present there seem to be no buyers at above 3.35¢, and few at over 3.30¢. The market thus has a weak as well as a dull appearance in the face of all the bullish speculative manipulation and argument that has been brought into play during the past two weeks.

**Spelter.**—Under the influence of good demand from Western consumers, along with about average buying in this city and vicinity, the market shows better form and closes quite firm. Single carload lots of ordinary Western went at 3.75¢ @ 3.85¢ for prompt and near future shipment. The latest sales were at the higher price. That is now bid, and in remote instances offers were

made as high as 3.87½¢ for ordinary delivery by speculative operators.

**Antimony.**—The jobbing demand is fair, but little, if anything, is doing in round lots. Prices remain quite steady, however, with 9⅝¢ @ 9¾¢ quoted for Hallett's and 10⅛¢ @ 10¼¢ for Cookson's.

**Tin Plate.**—Business has been slow, and the market is bare of really encouraging features. Spot goods are taken in small quantities only, as immediate wants may dictate, and the aggregate outturn is hardly up to the average. Interest in forward shipments is exceedingly tame, although prices have been quite freely quoted that range from 5¢ to 10¢ below current selling prices for spot goods. Spot quotations are as follows: Coke Tins—Penlan grade, IC, 14 x 20, $5.30; J. B. grade, do., $5.35; Bessemer full weight, $5.35; light weights, $4.95 for 100 lb, $4.85 for 95 lb, $4.70 @ $4.75 for 90 lb. Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis, $5.60; Siemens Steel, IC basis, $5.65; IX basis, $6.75 @ $7. Charcoals—Melyn grade, IC, $6.37½ @ $6.50; Crosses, $8; Allaway grade, IC, $5.60; Crosses, $6.75; Grange grade, IC, $5.75; Crosses, $6.85. Charcoal Ternes—Worcester, 14 x 20, scarce; do., 20 x 28, $11.35; M. F., 14 x 20, $7.35 @ $7.37½; do., 20 x 28, $14.75; Dean grade, 14 x 20, $5.35; do., 20 x 28, $10.50 @ $10.60; D. R. D. grade, 14 x 20, $5.15; do., 20 x 28, $10.10; Alyn, 14 x 20, $5.32½ @ $5.35; do., 20 x 28, $10.50; Wasters—S. T. P. grade, 14 x 20, $4.75; do., 20 x 28, $9; Abercarne grade, 14 x 20, $4.60; do., 20 x 28, $8.87½.

# New York.

Office of *The Iron Age*, 96-102 Reade street, NEW YORK, November 29, 1893.

**Pig Iron.**—Reports of additional sales of Southern warrants to speculative buyers are current. Some of the leading Southern producers are making an effort to secure better prices, but in this market no advance has yet taken place, since a good deal of cheap Iron is still offering. We quote: Northern brands, $14 @ $15 for No. 1; $13 @ $14.25 for No. 2; $12.25 @ $12.50 for Gray Forge, at tidewater. Southern Iron, same delivery, $13 @ $14 for No. 1; $12 @ $13 for No. 2; $11.50 @ $12.25 for No. 3; $11.75 @ $12.25 for No. 2 Soft, and $12.25 @ $12.50 for No. 1 Soft. Gray Forge is $11.25 @ $12.

**Spiegeleisen and Ferromanganese.**—In the absence of business we quote: Foreign Spiegeleisen, 10 % @ 12 %, $21.50 @ $22, and 20 %, $25.50 @ $26, on cars, Jersey City, and Ferromanganese, $55 @ $55.50.

**Billets and Rods.**—The market is very dull and is a shade weaker. We quote nominally: Domestic Billets, $20 @ $22, and foreign Billets $28 @ $28.50, tidewater; domestic Wire Rods, $28 @ $29, and foreign Rods, $39.50 @ $40, tidewater.

**Steel Rails.**—The new combination is a fact, all reports to the contrary notwithstanding. The tidewater price has been fixed for 1894 delivery at $24.80, while the price at Pittsburgh is $24 and at Chicago $25. The market has been altogether too unsettled to allow of any business being done, nor is it likely that any large tonnage will be placed in this market in the near future. Some of the leading roads appear to have covered their requirements. Old Steel Rails, fit to relay, in which there was quite a business, dropped down to $15.

**Track Material.**—We quote as follows for small lots: Spikes, 1.75¢ @ 1.90¢; Fish Plates, 1.30¢ @ 1.50¢; Track Bolts, Square Nuts, 2.10¢ @ 2.40¢, and Hexagon Nuts, 2.30¢ @ 2.50¢, delivered. Concessions would be made for round lots.

**Manufactured Iron and Steel.**—New business is very small in volume and there is very little new work in prospect in the near future. Prices continue very low under the leadership of the Western mills. A very large block of Hoops has been placed. We quote nominally: Beams up to 15-inch, 1.65¢ @ 2¢, 20-inch, 2¢ @ 2.25¢, for round lots; Angles, 1.65¢ @ 1.80¢; Universal Mill Plates, 1.60¢ @ 1.75¢; Tees, 2¢ @ 2.15¢; Channels, 1.70¢ @ 2¢, on dock. Steel Plates are 1.55¢ @ 1.70¢ for Tank; 1.75¢ @ 1.90¢ for Shell; 2¢ @ 2.15¢ for Flange, and 2.50¢ @ 2.80¢ for Fire Box, on dock; Refined Bars are 1.50¢ @ 1.9¢, on dock, and Common, 1.40¢ @ 1.50¢; Soft Steel Bars are 1.50¢ @ 1.70¢; Scrap Axles are quotable at 1.70¢ @ 2¢, delivered; Steel Axles, 1.70¢ @ 1.90¢, and Links and Pins, 1.70¢ @ 1.80¢; Steel Hoops, 1.75¢ @ 1.90¢, delivered; Cotton Ties, 70¢ @ 72½¢ ℔ 45-lb bundle, at mill.

**Old Material.**—We note a sale of a few hundred tons of Old Iron Rails at $12.50, which represents a further decline. Old Steel Rails have sold during the week at $9.

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George B. Douglas, who has been for many years representative of David Colville & Sons, Dalzell Steel Works, Scotland, has assumed as partner his brother, John B. B. Douglas, the new firm being Geo. B. Douglas & Bro. The office has been removed from the Boreel Building to Room 1005 Havemeyer Building.

# British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, November 29, 1893.

There has been very little movement in prices of Pig Tin the past week. Sales of prompts were made at as low as £75. 2/6 a few days ago, the steadiness in silver having no pronounced effect. A slight improvement in home demand and better inquiry from America brought a bouta reaction to £75. 10/ but there is complete absence of outside speculative interest and regular traders have been influenced very little by the propositions in the new American tariff bill.

Copper has been fairly active at intervals during the week, with more active home trade demand and better reports from America regarding the market there. It is stated that Merchant Bars sold for American account recently have been covered, and that some firms have been rebuying American Copper recently sold to Europe, but yet unshipped, at a profit to original purchasers. There is quite a good demand also for cash metal to cover old forward sales that also helps to improve the market. There is somewhat better outside speculative interest. Merchant Bars are now quoted at about £43. 2/6 for prompt and £43. 12/6 for three months' futures. Best selected English is now £46 upward.

Tin Plate prices are weak and irregular. Orders are scarce. The outlook is uncertain, owing to dearth of buyers in the face of lowness of prices. Over 20 works are idle, and many others are working to only part of their capacity, owing to prevailing dullness. This is attributed partly to "bear" operations directed against dealers in London and Liverpool who hold immense stocks. Last returns show total stock of 258,000 boxes in Swansea. Liverpool quotations for Plates are as follows:

| | |
|---|---|
| IC Charcoal, Alloway grade | 12/6 @ 13/ |
| IC Bessemer Steel, Coke finish | 11/3 @ 11/6 |
| IC Siemens " " " | 11/6 @ 11/9 |
| IC Coke, B. V. grade, 14 x 20 | 11/3 @ 11/6 |
| Charcoal Terne, Dean grade | 11/ @ 11/3 |

Pig Lead is a trifle weaker, with sellers at £9. 10/ for soft Spanish and the demand slow.

There is hardly anything more than routine demand for Spelter, but prices are quite steady at £17. 2/6 for ordinary Silesian.

In the market for Iron and Steel there has been hardly any change aside from ordinary fluctuation in prices of warrants. Business has been moderate in all departments and the demand is only fair. Makers' prices of Pig Iron were advanced somewhat, owing to higher quotations on warrants, but are now rather weaker. Last dealings in warrants were at 43/ @ 43/2 for Scotch. 34/9 @ 35/ for Cleveland, and 45/ for Hematite.

## The New Sheet Scale.

As announced in these columns last week, an agreement has been reached between the Association of Iron and Steel Manufacturers and the Amalgamated Association, by which a straight reduction of 10 per cent. on the sheet mill scale has been granted the manufacturers. It will be remembered that at the first meeting of the two committees representing the employees and the sheet mill owners, a settlement was prevented on account of the Amalgamated Association refusing to reduce wages of roughers and catchers, which they claimed were already low enough. The manufacturers insisted that a straight reduction of 10 per cent. must be granted, and the matter was finally settled by the rollers agreeing to accept that part of the reduction which would fall upon the roughers and catchers. Below we print the new scale governing sheet mills, which became effective on Monday, November 20, and is as follows:

SHEET MILL.

Western scale of prices agreed upon between the Association of Iron and Steel Manufacturers and the Amalgamated Association of Iron and Steel Workers, at Pittsburgh, Pa., on November 22, 1893, to be in force for the year ending June 30, 1894. It is agreed that at a 2-cent Western Iron Association's card, the prices for rolling on a sheet and jobbing mill shall be as follows, with 2 per cent. additional for each one-tenth advance of said card, and 2 per

cent. decline for each deduction of one-tenth from said card:

| Gauges. | Price for rolling on a 2-cent card, per ton, 2240 lb. |
|---|---|
| No. 8 and heavier | $3.24 |
| Nos. 9 to 11 | 3.60 |
| Nos. 12 to 14 | 4.32 |
| Nos. 15 to 17 | 5.00 |
| Nos. 18 to 21 | 6.07 |
| Nos. 22 to 24 | 7.20 |
| Nos. 25 and 26 | 8.28 |
| No. 27 | 9.00 |
| No. 28 | 9.59 |
| No. 29 | 10 34 |
| No. 30 | 10.80 |

| Gauges. | Price for rolling on a 2-cent card, per ton, 2240 lb. |
|---|---|
| No. 8 and heavier | $2.70 |
| Nos. 9 and 10 | 3.15 |
| No. 11 | 3.60 |

Balance of scale to remain as at present. This to apply only to two-high jobbing mills rolling No. 10 and heavier over 48 inches in width.

TIN AND BLACK PLATE MILLS.

It is agreed that at a 2-cent Western Iron Association card the prices for rolling, shearing, doubling and heating on a tin and black plate mill shall be as follows, with 3 per cent. additional for each one-tenth advance of said card, and 3 per cent. decline for each deduction of one-tenth from said card:

| Gauges. | Rolling steel, 2240 pounds. | Doubling. | Heating. | Shearing on jaw or crocodile shears, and job work on squaring shears. |
|---|---|---|---|---|
| Nos. 8 to 11 | 2.04 | .93 | .85 | .99 |
| Nos. 12 and 13 | 2.14 | .96 | .90 | |
| Nos. 14 and 15 | 2.45 | 1.10 | 1.07 | |
| Nos. 16 and 17 | 3 24 | 1.46 | 1.32 | 1.59 |
| Nos. 18 to 20 | 3.62 | 1.63 | 1.48 | |
| Nos. 21 to 24 | 4.07 | 1.86 | 1.63 | |
| Nos. 25 and 26 | 4.57 | 2.07 | 1.88 | 1.71 |
| Nos. 27 and 28 | 4.63 | 2.21 | 2.05 | |
| Nos. 29 and 30 | 5.30 | 2.70 | 2.48 | 1.76 |
| No. 31 | 5.40 | 2.84 | 2.68 | 1.78 |
| No. 32 | 5 65 | 2.97 | 2.79 | 1.88 |
| No. 33 | 5.99 | 3.13 | 2.88 | 1.98 |
| No 34 | 6.64 | 3.33 | 3.15 | 2.21 |
| No. 35 | 6.98 | 3.52 | 3.34 | 2.30 |
| No. 36 | 7.43 | 3.60 | 3.47 | 2.46 |
| No. 37 | 7.52 | 3.65 | 3.52 | 2.49 |
| No. 38 | 7.61 | 3.72 | 3.58 | 2.52 |

1. Fifteen per cent. less than above prices for iron, except shearman.
2. Shearman on modern squaring shears to receive $1 per turn. This clause only applies for shearing tin plate.

EXTRAS.

1. Twenty per cent. added for changed steel and 20 per cent. on net price of iron.
2. Seventeen per cent. added for pickle finished iron and steel, except shearman.
3. For all sheets sheared into circles on tin and black plate mills where the loss exceeds 10 per cent., 20 per cent. extra shall be paid.
4. That all sheets cut down to smaller sizes on tin and black plate mills be paid for at scale prices.

The heating system adopted at the new works of the Bucyrus Steam Shovel & Dredge Company, South Milwaukee, Wis., described in a recent issue of *The Iron Age*, was that of the Huyett & Smith Mfg. Company, Detroit, Mich.

Frank S. Witherbee of Witherbee, Sherman & Co., Port Henry, sails for Algiers to-day.

## The Effect of a Perpetual Wages Scale for Iron Workers.

If the proprietors of rolling mills and the Amalgamated Association of Iron and Steel Workers should finally agree that the existing scale of wages be made perpetual, only to be changed by three months' notice from either side, the beneficial effect will be so far reaching that the subject is worthy of notice in advance, and all interested should make earnest efforts to bring about such a state of affairs. The present result of negotiations has given great satisfaction in the industrial parts of the central States, but there will be still greater cause for gratification if the perpetual scale is adjusted.

The prevailing opinion among manufacturers and others whose interests are allied to the iron and steel industries is that greater stability in business will result; that there will be less fluctuation in values and an absence of that speculation in stocks of material which the present arrangement encourages. Under existing conditions, the annual July scare in regard to the probable outcome of wage conferences produces an unnecessary agitation in commercial circles, and everything runs at high pressure during several months before the time approaches, only to be followed by a distressing calm and policy of retrenchment on the part of buyers in case an amicable settlement is reached.

Consumers of rolling mill products are anxious to make certain that their orders will be filled to cover a few months' requirements in case of a lockout, and they place specifications early with jobbers or dealers, who in turn crowd the mills to their utmost capacity; but if the lockout does not take place cancellation of orders usually follows and business is thrown into a generally unsatisfactory state.

Under the new arrangement there will be a greater certainty that operations of rolling mills will continue with regularity during the year. The manufacturer will know that his stock of bar iron, sheet iron or other material which he uses can be replenished by giving a week's or ten days' notice to his jobber, and he will not have to borrow money to lay in stocks as a safeguard against July strikes. Jobbers of Chicago and the Northwest will not be compelled to place contracts for spring and summer delivery for material which they expect to sell in the fall, the quantity of which they can only guess at, as the sales throughout that territory depend, in their extent, very much upon the weather. During past years this scare has reached even small consumers in isolated territory, and cases are common where a tinner or blacksmith has placed his order for a few bundles of iron many months ahead for the sole purpose of being prepared against labor troubles. From these rivulets of commerce rivers grow, and the effect grows with the increasing volume of business. The jobbers speculate on the number of small consumers who are holding back their orders, and thus the ups and downs are caused.

Under the proposed changed conditions orders will be distributed over longer periods, and more stability to business will result. All concerned will be benefited, not omitting the iron worker, for he himself will soon concede that he is far better off if he only works four days of a week the year around than if he made full time for six months and was idle the balance of the year.

While discussing this subject the writer would ask, Why cannot the arrangement be made still more secure by making the scale perpetual and sliding? The 1½-cent card rate may soon be as absurd as the 2-cent card rate has been in the past. Now is the time for a permanent adjustment. The scale is settled until April 1, 1894; when the average selling price of bar iron or sheet iron is known for the intervening period let that price govern the ensuing three months' scale of wages, and so during the year, and, for that matter, for all time. A committee of workmen could meet a committee of manufacturers every quarter, and there would be little trouble in reaching a satisfactory agreement.

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# HARDWARE.

## Condition of Trade.

BUSINESS during the past week has been without material variation in volume except the falling off which is expected at this season and during the last days of the month. The market has been characterized by a somewhat more hopeful tone, and manufacturers and merchants have been making their plans for a more vigorous conduct of their business. While the volume of trade has not increased, inquiries in regard to future shipments and the placing of orders for spring delivery have been more frequent, which was regarded as an indication that things were resuming their normal course. The announcement of the new Tariff bill, however, with its large reductions in the duties on the many lines of Hardware and related goods, will, it is apprehended, have the effect of unsettling business and checking the improvement which was beginning to make itself apparent in trade circles.

### Chicago.

(*By Telegraph.*)

Shelf Hardware jobbers report a somewhat better condition of business. Not only are orders a little more numerous, but collections are also improving considerably. Shelf goods are going out in larger volume, as well as seasonable goods. The demand for Snow Shovels and other winter supplies, Skates, Sleds and holiday goods generally has been very fair during the week. There is also increased movement in Sheet Iron and Tinners' Stock. Owing to the sustained winter weather, no material change is reported in the price of Shelf goods. Manufacturers seem to have produced in sufficient quantities only to meet the regular demand, and are, therefore, not pressing sales of accumulated stock, as in some other lines. Heavy Hardware keeps up fairly well, owing to the demand for Iron and Steel coming in from both large and small consumers. There are indications of an improvement in the Carriage trade, and a few orders have already been entered for Carriage material for spring delivery.

### St. Louis.

(*By Telegraph.*)

There is a partial falling off in trade since our last report. Retailers will not stock up, and only order as their needs require. Jobbers are preparing for renewed activity after the turn of the year. That they do not anticipate to equal their spring trade of last year is evidenced by the fact that one of the largest jobbing houses here is only ordering sufficient goods to do 75 per cent. of the business they did last spring. This is not encouraging, but it is the truth, and it is to be hoped that the house referred to will be disappointed in their low estimate. Remittances are received regularly, and a number of concerns are now discounting their bills, showing that a better financial feeling exists. The demand runs largely to seasonable goods, and prices as a rule are well maintained.

## Notes on Prices.

**Wire Nails.**—The market has developed no special features of importance since our last review. The demand is only moderate, but the aggregate is considerable, as the low prices which are ruling induce many dealers to purchase such Nails as they require in the near future. Quotations continue on a basis of $1.15 to $1.20 for round lots at mill, the former figure being usually obtainable on good orders. Carload lots delivered in New York are quoted at $1.35.

*Chicago, by Telegraph.*—The heavy purchases of Wire Nails continued during the past week, but as navigation on the lakes has now closed, the movement will probably be light from this time. There are, however, inquiries for delivery in January, February and March, but manufacturers hesitate to quote so far ahead. Prices dropped to a little lower level during the active trade of the past week, but with the change to all rail delivery an effort is being made to keep prices at the equivalent of $1.30, Chicago. Small lots are now selling at $1.40 to $1.45 from stock.

**Cut Nails.** The condition of the Cut Nail market is unsatisfactory, but prices are not quotably lower than last week. The market is represented by the quotation of 95 cents for carload lots at mill, though this figure is shaded and orders can be placed at 90 cents. Small lots from store in New York are quoted regularly at $1.20.

*Chicago, by Telegraph.*—A fair trade is in progress in Cut Steel Nails, with continued good shipments to the Southwest. Wheeling Nails are again being quoted in this market quite freely, but thus far little business has resulted, as the local makers appear to have a firm grip on the trade. Prices on factory lots are quoted at $1.15 to $1.20, according to the character of the order, while small lots from stock are selling at $1.25.

**Barb Wire.**—In view of the unsatisfactory condition of the market and the extremely low prices which are ruling, some of the manufacturers are practically withdrawing from the market for the time being, refusing to meet the prevalent figures. The competition, however, continues active and prices are low and weak. We continue to quote $2.15 to $2.20 for car lots of Four-Point Galvanized at mill.

*Chicago, by Telegraph.*—The demand for Barb Wire is of a light character throughout the Northwest and manufacturers appear to be getting most of their business from the South and Southwest. Competition for this business has been keen, but so far it has not affected the local trade. Carload lots of Galvanized are quoted to purchasers in this vicinity at $2.40, while jobbers quote small lots from stock at the old rate of $2.55. Heavy transactions have taken place in Plain Wire at lower prices than ever before made in this vicinity.

**Skate Sharpener.**—The Union Skate Sharpener, manufactured by the Union Hardware Company, Torrington, Conn., an illustration of which appeared in our issue of November 16, 1893, is listed at $3 per dozen, subject to a discount of 30 per cent. to the retail trade.

**Climax Lamp Stove.**—The Climax Lamp Stove, which was illustrated in *The Iron Age* of November 23, 1893, is manufactured by Clarence M. Kemp, 101 North Frederick street, Baltimore, Md. The stove is sold to the trade, without the lamp, at $48 per dozen, net.

**Brass Nails.**—The Just Enough Brass Nails, manufactured by the Grand Crossing Tack Company, Grand Crossing, Chicago, and illustrated in *The Iron Age* of November 2, 1892, are sold at 50 cents per carton of 20 papers.

**Novelty Scraper.**—Smith's Novelty Scraper, an illustration of which was given in our issue of November 16, 1893, is manufactured by Fernando B. Smith, Canton, Ohio, and is sold at 75 cents per dozen, or $7.20 per gross, net, f.o.b. Canton.

**Sliding Door Latch.**—The Sliding Door Latch illustrated in *The Iron Age* November 23, 1893, and manufactured by Lane Brothers, Poughkeepsie, N. Y., John H. Graham & Co., 113 Chambers street New York, agents, is sold at $4 per dozen, subject to a discount of 25 per cent.

**Universal Brace.**—The Universal Brace, manufactured by the National

Mfg. Company, Wilkesbarre, Pa., and illustrated in *The Iron Age* of November 16, 1893, is sold at a discount of 20 per cent. from the following list:

| | Sweep | | |
|---|---|---|---|
| | 6-inch. | 7-inch. | 8-inch. |
| Nickel plated, per doz.. | $33.00 | $36.00 | $39.00 |
| Black enameled, nickel plated trimmings, per doz..... | 30.00 | 33.00 | 36.00 |

**Glass.**—The dissolution of the Plate Glass Manufacturers' Association, to which reference was made in our last issue, has resulted in an open market, and manufacturers of American Plate Glass are in a position to accept orders at any price they may individually choose. There is a reported decline in prices from factory of 20 per cent. American Window Glass is being sold from factory at 85 and 20 per cent. discount for Single Strength and 85 and 20 and 5 per cent. discount for Double Strength. In face of a declining market something like 200 additional pots are reported as having gone into operation since our last report. French Window Glass is still quoted at 75 and 10 and 5 to 80 and 5 per cent. discount. It is too early to surmise what reduction the proposed tariff would make in the selling price of imported Glass, or to what extent it would affect American Glass manufacturers.

## New Members of the Hardware Club.

THE following gentlemen have recently been elected members of the Hardware Club of New York:

GEORGE H. BARTLETT,
Bethlehem, Pa.

J. H. CAMPBELL,
Deputy City Chamberlain,
New York.

L. C. DAWES,
Editor *The Metal Worker*,
New York.

JOSEPH J. O'DONOHUE,
City Chamberlain, New York.

DANIEL E. SEYBEL,
41 Park row, New York.

R. W. SHAPLEIGH,
St. Louis, Mo.

THEODORE H. SILKMAN,
41 Park row, New York.

E. OSBORN THOMPSON, JR.,
245 Broadway, New York.

## European Imitations of American Arms.

WE HAVE already referred to the fact that of late the Continental manufacturers of Firearms have been imitating American patterns and in some cases counterfeiting brands and trade-marks. This has for some time been done in connection with the Arms of Smith & Wesson, Springfield, Mass., which have been imitated in Belgium, and in many cases their marks have been counterfeited on both barrels and stocks of an inferior class of Revolvers, thus injuring the firm's reputation and business. With a view to preventing this they have recently had their marks registered in all the principal countries of the world, including Belgium, and have instituted proceedings against the makers of and dealers in these imitations with a view to putting a stop to this piracy. Within a short time their attorneys in Liege have seized a large quantity of these spurious Arms and brought action in the courts against the makers and dealers, and an early and favorable decision is expected. Smith & Wesson advise us that they propose to push the matter strenuously, and are confident of the successful termination of their efforts to protect their name and business interests.

## The Van Wagoner & Williams Company.

A PLAN for reorganizing the Van Wagoner & Williams Company, under the name of the Van Wagoner & Williams Hardware Company, who have their plant in Cleveland, Ohio, and their Eastern office at 14 Warren street, New York, is being submitted to the creditors. The Committee on Reorganization, composed of Messrs. Austin B. Fletcher of 29 Broadway and Edward P. Lyon of 34 Nassau street, in connection with some of the largest creditors and the receivers, found that the plant was very valuable and well worth being continued as a going concern, and therefore have prepared a plan which has already been approved by about three-fourths of the creditors. The main features are to have the creditors accept for their claims a 7 per cent. cumulative guaranteed stock; and as there is a large amount of property and the earning capacity of the company is great, it gives value immediately to this guaranteed stock, while doing justice to all other interests. In this way it is expected that the creditors will be able to realize their claims in full and the company will be relieved from all indebtedness. C. S. Van Wagoner and Wm. H. Williams will retain their respective positions in charge of manufacturing and marketing the product of the company. The new company will be capitalized at about $750,000, $600,000 of which will be fully paid in, provision being made for gradually retiring the guaranteed stock, upon the accomplishment of which the control of the company will pass to the original stockholders. It is expected that the plan determined upon will place this popular concern upon a sound financial basis and promises a successful future for the business.

## It Is Reported—

That the storage warehouse of George M. Steinman & Co., Hardware dealers, Lancaster, Pa., was destroyed by fire on the 14th inst. The warehouse was 60 feet long by 25 feet wide. The stock was valued at $4500, partly insured.

That T. Covert has sold out his Hardware business at Byron, Neb.

That the Hardware store of Sawyers & Havens, Bellevue, Mich., was recently burglarized.

That Treat & Son, Le Mars, Iowa, have sold out their Hardware business to C. W. Waldeck of Cedar Rapids.

That Libby & Stiles have recently entered the Hardware business at Denmark, Maine.

That the Hardware stock of Turner & Kirch, Chanute, Kan., was destroyed by fire on the 14th inst.

That E. S. Fonda has disposed of his Hardware business at Little Cedar, Iowa.

That Ambrose Bros., Hardware merchants, Gallatin, Mo., have sold out their stock to J. T. Gough and S. J. Dice.

That A. S. Hovey of Lake City, Mich., will in the spring open a Hardware and furniture store at McBain, Mich.

That the Hardware store of John Waeldin, Johnstown, Pa., was robbed on the 15th inst.

That A. L. Winder, Hardware merchant, Berkley, Va., has moved into new quarters.

That the stock of Tinware in the Stanton Hardware store at Oneonta, N. Y., has been purchased by J. M. Roney, who will remove it to Arena, Delaware County.

That Moses Crosley of Farina, Wis., has purchased H. C. Saunders' interest in the Hardware firm of Saunders & Naxon, Milton Junction, Wis.

That the Hardware stores of Byers & Woodward and C. B. Moss, at Grand Ridge, Ill., were destroyed by fire on the 17th inst. The former firm's loss was $5000, with insurance of $3000; Mr. Moss's loss was $3500, with insurance of $2000.

That the warehouse of the Texarkana Hardware Company, Texarkana, Ark., was destroyed by fire on the 17th inst. Loss, $4000; insurance, $1500.

That thieves recently broke into the Hardware store of Sheldon & Hande, Spring Valley, Minn., and got away with $200 worth of Cutlery and Revolvers.

That the Hardware store of J. K. Aldridge, Chestertown, Md., was robbed on the morning of the 13th inst. The plate glass front, $\frac{5}{16}$ inch thick, was smashed in with a brick, the crash being heard nearly two squares away. A hole was broken scarcely large enough to admit the body of a large sized man, and through this the robber entered. The safe, in which a small amount of money had been left and which was not locked, was then rifled of about $20. Some pistols and cartridges were also stolen, together with about $10 from the money drawer.

That George Ripley will soon open a new Hardware store at W. Stewartstown, N. H.

That Neuman & Fechner's Hardware store, at Stanton, Neb., was robbed of Revolvers, Razors and Pocket Cutlery on November 16.

That $50 worth of goods were taken from the Hardware store of Levi Baker, Lincoln, Neb., on November 13. This is the third or fourth time that the store has been robbed.

That Fred. Howlett, Gregory, Mich., contemplates putting in a stock of Hardware in the store recently vacated by N. E. Moore.

That Paris McKenzie has purchased a half interest in his father's, H. F. McKenzie's, Hardware store, at Chesaning, Mich.

## John P. Chatillon.

JOHN P. CHATILLON, the subject of this sketch, was born in New York, April 7, 1845, and died in Paris, France, November 17, 1893, of Bright's disease. Just one year from the day of his decease he left New York by steamer, accompanied by two sisters, two of his older children and a trained nurse. His plan contemplated spending the winter and spring along the Mediterranean with a view to a restoration of his health. The party went direct to Naples, and eventually visited the leading cities of the Continent. Since the death of his wife, about eight years ago, those who knew Mr. Chatillon intimately perceived a change in him, although generally among his associates and business acquaintances he has been known as an invalid for but a comparatively short time.

The concern now so widely known and of which he was a part was inaugurated by an uncle, George H. Chatillon, in Cherry street in 1835. In 1842, upon the death of the founder, the enterprise was taken by a brother, John Chatillon, father of the deceased. John P. Chatillon began his education in a public school in this city and eventually graduated from the College of the City of New York. Soon after leaving college he was employed by the old Hardware establishment of Clark, Wilson & Co., at 81 Beekman street. He remained there until 1868, when he was taken into his father's business.

In 1872, before the death of his father, which occurred that year, he and his brother, George H. Chatillon, were admitted to a partnership. Since that time the management of the concern has been solely in their hands.

John P. Chatillon was long a director in the American Institute of New York and for years chairman of its Fair Committee. He was also a member of the Arion Society. He leaves a son and three daughters. While it was known that he was in impaired health, the tidings of his death were a surprise to his friends, and were received with sorrow by all who knew him, by whom he was held in high regard for his business abilities and personal worth.

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IN A FIRE at Concord, N. H., on the 11th inst., the Hardware stock of Thompson & Hoague in their Main street store was badly damaged by water. The loss is estimated at $8000 or $10,000, which is fully covered by insurance. Their wholesale building in Railroad square was, however, uninjured, and as their stock carried therein is very complete they will be able to fill orders as usual. The catalogue cupboard of the firm having been thoroughly wet new copies of catalogues, circulars, &c., from manufacturers will be thankfully received by them.

## The Business Depression.

AN ADDRESS BY WILLIAM W. SUPPLEE.

THE FOLLOWING ADDRESS was made by William W. Supplee, president of the Supplee Hardware Company, before the HARDWARE MERCHANTS AND MANUFACTURERS' ASSOCIATION OF PHILADELPHIA, at their meeting, November 23, by whom its publication was requested. We take pleasure in laying it before a larger audience than the influential body to which it was originally presented:

JOHN P. CHATILLON.

*Mr. President and Members of the Hardware Merchants and Manufacturers' Association:*

I am before you in compliance with a request made at the last meeting of the association that I read a paper on: "Our present business depression. To what extent has the fear of tariff reduction been responsible?"

There has been sufficient discussion in Congress on our business depression and the causes of the same to fill hundreds of pages of the *Congressional Record*, and editors of papers have aired their opinions daily for the last eight months.

The renowned novelist, Walter Besant, while recently traveling in this country, remarked: "The American people are a nation of readers. You see them reading eyerywhere; on the railway cars you will see men with two to four daily papers, eagerly devouring their contents."

In this he is unquestionably correct. The great majority of these readers, however, confine their reading to papers which represent their political views. These readers must naturally become biased in their opinions and prejudiced in forming their conclusions on important subjects under discussion.

One finds it an easy matter to say the fear of tariff reduction is largely reponsible for certain conditions; equally easy to deny it has been in any way responsible; quite as easy to attribute the conditions solely to the Sherman silver purchasing clause.

Therefore, I may be expected to illustrate why and how I arrive at the conclusions. The three years preceding the year 1893 were years of exceeding prosperity. Labor had never been more fully employed, and wages were never so high.

Reference to Aldrich's report, sustained by the Bureau of Statistics and by the present Secretary of the Treasury, showed the wage earners enjoyed the largest proportion of that which they produced than any other class of labor ever enjoyed in the history of the world. The wage earners were never so well paid, and the masses never earned so much.

Reports of the deposits in savings banks in the United States showed that the wage earner had upon deposit a larger amount than ever before known.

Foreign commerce exceeded any previous experience; manufacturers had orders upon their books that would require months to execute; mercantile houses showed an excess of trade over any previous years; money was plenty, and, owing to the prosperous times, banking houses extended credit freely. Indeed, we were in the midst of unparalleled prosperity; nor was there any visible evidence of overproduction, and almost in a day, as if by a magic wand, the scene was entirely transformed.

The cause or causes that produced this change were, I believe, as stated in an article written for *The Iron Age*, under date of August 17, and I have no reason since for changing the then expressed opinion:

FIRST (and greatest).—The mistaken theory of surplus reduction.

SECOND.—Partisan insincerity.

THIRD.—Government's experimental financial policy.

FOURTH.—The silver law existing prior to July, 1890, supplemented by the Sherman silver purchasing clause July 14, 1890.

Referring to the first and second of these four, in the year 1879, when the Secretary of the Treasury, John Sherman, resumed specie payments, the cash in the United States Treasury was over $380,000,000, and the Government receipts beyond expenditures for the fiscal year were about $20,000,000, and the demand indebtedness was then as many millions less than at present.

At that time many questioned the ability of successful resumption. Years

later the same element astounded the country by advocating the reduction of our Government surplus (then between $200,000,000 and $300,000,000) to $100,000,000, giving as their reason for reduction the saving of a few millions in interest.

This theory touched the masses, largely unacquainted with financial results, and it became a party factor, which eventually both parties adopted; even the framers of the present McKinley bill so regulated it as to insure a reduction in our revenue receipts, and as we are all aware, $100,000,000 was adopted as a gold redemption reserve, not to be encroached upon. Fortunately, owing to a favorable trade balance, we were able to retain a sum in excess of this amount until the spring of 1893, when trade balances ran largely against us.

This Government surplus reduction was one of those vagaries founded upon theory, which could not be sustained from precedent or experience, and placed us at the mercy of foreign countries in search of gold, and equally disadvantageously when any scarcity of gold existed in our own country.

In February, 1893, the reserve gold in the United States Treasury ran from $104,000,000 to $106,000,000, slightly in excess of the amount which the law required, but with this small sum we were liable to be called upon to redeem over $1,000,000,000 of redeemable gold notes, silver and silver Treasury notes.

In the meantime, balance of trade became largely against us; besides, Europe had been drawing largely on us for gold in exchange for bonds, and partisan editorials had for two months flamingly stated that when our gold went below the $100,000,000 mark, as a nation we were bankrupt. It had now about reached that mark.

Partisan insincerity (please do not construe partisan as political) had inflamed the public mind, as well as the minds of foreign investors, who plainly saw that we had less than 10 per cent. of available gold to redeem our entire demand indebtedness, and naturally feared the result.

At this state of the public mind the change of administration came, quite unprepared from recent experience to meet the emergency, and a policy of inaction temporarily controlled the Government's financial policy and our gold reserve had gone below the mark.

Financial leaders of our country discussed the situation, and, fearing the results, offered the United States Treasurer assistance which unfortunately was rejected. Had it been accepted I very much doubt whether the object lesson would have occurred. As it was, heads of financial institutions became uneasy, and perhaps some of them unnecessarily aggressive. Europe looked with distrust not only on what might seem our inability, but at the uncertainty of what might perhaps follow.

At this juncture the Secretary of the Treasury, doubtless with good intentions, to prevent further drawing of gold, stated that, according to law, he did not consider it necessary to redeem silver certificates in gold, and he would redeem them in silver.

Here came the crisis, it being a well-known fact that the Secretary had voted for free coinage in the Senate, and the intimation that silver, worth about 70 cents on the dollar, would be paid in the place of gold startled not only this country but foreign nations.

Soon after this England intensified the panic by closing the mints in India. The situation became serious and perplexing. A dark cloud overcast our entire financial sky. In order to quiet the unrest, President Cleveland was called upon to reverse the decision. He stated we would redeem all the Government's indebtedness, including silver certificates, in gold; but there had been vacillation. No one supposed the Secretary of the Treasury had given his opinion without consultation. Therefore, nothing more than an experimental financial policy could be inferred.

In addition to this, visions of State bank notes were seen in the distance. Our revenue receipts were now running less than our expenditures, and we were paying out about $3,000,000 per month for silver, which amount, however, in prosperous times, had neither affected our credit or finances.

We all remember the condition of the country at the time the President's special message called Congress together, from which message I quote as follows:

"The existence of an alarming and extraordinary business situation, involving the welfare and prosperity of all our people, has constrained me to call together, in extra session, the people's representatives in Congress.

"The distrust and apprehension concerning the financial situation which pervade all business circles have already caused great loss and damage to our people, and threaten to cripple our merchants, stop the wheels of manufacture, bring distress and privation to our farmers, and withhold from our workmen the wages of labor."

Referring to the above extracts, one would naturally ask had the silver purchasing clause been the sole cause of the panic upon us at that date, would it not at least have gradually shown itself to some extent during the three preceding years?

Congress, however, met under the gravest situation of industrial and financial convulsion. Deposits were withdrawn from banks and hoarded by individual owners; hundreds of banks failed or temporarily suspended; trust companies refused to make payments other than under the 30 or 60 day rule; both currency and gold commanded a premium, and hundreds of manufacturers were obliged to close their works, failures were being recorded at the rate of 400 to 500 per week; mercantile houses kept their forces employed at a loss to themselves, and wage earners were daily being thrown out of employment, until the number reached some 2,000,000.

I am not a believer in the notion that the purchasing of the comparatively small amount of silver, $3,000,000 per month, which sum, according to a construction placed upon the law by Mr. Carlisle, was reduced to a trifle over half (by buying silver on London quotations only), could alone be the cause of our financial troubles, and I think it folly to suppose that President Cleveland saw no other cause. It doubtless became apparent to him that we could no longer sustain our financial credit other than by paying our obligations in coin that had an equal par value in all parts of the world.

I believe he also saw the mistake in the attempt to sustain our credit upon our present small surplus, but was too shrewd a politician to state it in his message.

It was about this date that an English publication, known as the London *Commerce* wrote as follows: "The proportion of gold held by the Government of the United States to its liabilities in respect to the amount of notes and currency certificates issued has diminished to a corresponding degree, with the result that foreign capital has ceased to flow into the States."

I do believe, however, that had Congress acted sagaciously, promptly and effectively in correcting a law which was drawing even a small amount from our already depleted Treasury, and then have strengthened our gold reserve by, say, an additional $150,000,000 to $200,000,000, the gathering clouds which collected themselves in Europe, and were wafted to this country, would never have penetrated over all our financial and industrial enterprises and reached the households, to more or less extent, thoughout our entire land.

It would, therefore, naturally appear that had it been believed by the Representatives in Congress that the silver purchasing clause was the sole cause of our trouble, the strain would have been at once relieved; but the leader in the United States Senate, Mr. Voorhees, had opposed a bill repealing this same law in February, 1893, and it was not accepted as the sole cause of the trouble; hence, hesitancy, which proved so destructive to the country, and the verdict of some 1500 commercial bodies had but an indifferent effect to urge action.

Fortunately, in time conditions changed. The financial situation was relieved in a measure from large to small importations from abroad, and by being able to dispose of a large amount of grain, even at a low price, the balance of trade became favorable to us.

A large amount of money was borrowed in Europe on hypothecated securities, and a large amount of stocks which had been materially reduced in value was bought up by foreign investors, which repaid the debt, so that the deposits in our banks became normal, and even several millions in excess of the usual surplus.

But the money taken from the banks and temporarily hoarded by individual depositors, when unlocked, was to be used cautiously; fear of a return stared people in the face.

The bell that sounded the alarm was not the only sound. Chimes of bells ringing caution, economize and retrench were heard.

A well clothed and well housed nation could pass one year with but little expenditure in their outfit; well equipped railroads could economize for a year; anticipated and projected improvements could be postponed, but all at the expense of a lesson to trade.

The reduction of the purchasing power, through enforced idleness and its correlatives, will, in itself, extend into billions of dollars.

The reduction in the purchasing power, through the decline in wheat, cotton, wool and corn, has had a surprising effect, and the fearful liquidation of stocks of 30 to 50 per cent. from their former value caused further contraction in the volume of trade. Let us consider, therefore, what the loss of some $2,000,000,000 of trade from the above causes involves. Besides, both wholesale and retail merchants restricted their purchases to immediate wants, and manufacturers who had closed their doors found no immediate inducement to resume, preferring to await a certain revival in trade.

One would naturally suppose that the prospect of a tariff revision, with its uncertainties, would have had an aggravating effect upon the situation, but I am unwilling to believe that either manufacturer or merchant would refuse present trade offered fearing the results of what might occur one year hence.

It is also worthy of notice in this connection that out of several hundred manufacturers who had from various causes closed their doors not 5 per cent. of the number who were asked for information have been willing to admit they were affected by expected tariff reduction.

It is quite probable that many manfacturers have been induced to start their works only on conditions which

have involved the wage earners sharing a portion of the uncertainty and responsibility by a decline in wages.

But public opinion has undergone considerable change regarding tariff legislation within the last few months. The fact of our present revenue being insufficient has had its effect upon those who have the matter in charge at Washington, and the pulse of public opinion has been felt at various times in a suggested advance in sugar duties and the advisability of an income tax, neither of which have met with popular approval. Local representatives from various sections of the country have shown a desire to modify or suppress a reduction affecting their own immediate industries, and we think that it is generally conceded that a general decline in duties upon goods suicidal to our domestic manufacture is impracticable and will be touched upon cautiously.

I can therefore see nothing which indicates that the fear of tariff reduction has thus far had any material influence upon the present business depression. Whatever may be the effect of the proposed tariff legislation during the coming winter remains in the dim future, and need not now be discussed. I have not been called upon to express an opinion on the future.

The reasons which I believe have been the cause of the present panic have not all been removed. I believe the first is essential before recuperation is complete. At the present time we have less than 8½ per cent. reserve gold to pay our demand indebtedness. When this is corrected, then if we could be assured that the proceedings in Congress on the Tariff during the coming winter would not disastrously affect trade, men who have money invested at the risk of business and commerce, and our banks that now hold almost an unprecedentedly large surplus reserve, would feel more secure in extending credits; manufacturers would then be disposed to anticipate a revival of trade, and the services of the wage earner would naturally be called for.

It may be well to call to mind, however, that a cyclone may destroy an entire town in a night, but it may require years to rebuild.

## An Abnormal Demand.

THE CHICAGO Hardware merchants have experienced an unusual demand the past two or three weeks for Bolts, Sash Locks and Revolvers. There has been an alarming increase in house breaking and in highway robbery, and the natural result is that the citizens are endeavoring to protect themselves as thoroughly as possible. Bolts are being put on doors which hitherto have been deemed sufficiently secure when locked in the ordinary manner, and peaceful citizens who never fired a pistol in their lives have suddenly transformed themselves into walking arsenals. Hardware merchants say that the demand for the articles referred to is greater than they have known for a long time. It is, of course, only temporary, but for the time it has amounted to a small sized boom. Extraordinary police precautions are now being taken to suppress the people who are committing depredations, and perhaps by this time the scare is over. It is ascribed by the authorities to the scarcity of employment, and the sudden advent of cold weather has also made many desperate who were in absolute need. It is not a condition of things which makes Chicago Hardwaremen happy, even if they do receive some profit thereby.

## The Hardware Club of New York.

### I. DESCRIPTION OF PREMISES.

WE GIVE HEREWITH detailed drawings, engraved from the architect's drawings, showing the ground plans of the premises which the Hardware Club will occupy in the near future. They are located in the upper portion of the noble Postal Telegraph Building, at the corner of Broadway and Murray streets, and were arranged specially with a view to their accommodation. Owing to law suits, fires, strikes and other delays the completion of this structure has been interfered with, but February 1 is now named as the time when the club authorities can take possession and prepare the apartments for occupation.

#### THE BUILDING.

As originally intended the edifice was to be 13 stories high, but as the result of negotiations between the governors of the club and the Postal Telegraph Company, a fourteenth story has been added for the use of the club, and above it a mezzanine floor for storage, and above this an extensive addition on the roof for culinary purposes, the help's dining rooms, &c. The proprietors of the building have taken pleasure in meeting the views of the club in a most liberal spirit, arranging the rooms as desired, and giving the whole an elegant finish, thus adapting the premises perfectly to the purposes of the club. In view of this fact the club would practically be no better off if they had projected and erected the building themselves, renting that part of it for which they have no use. Outside of the portion reserved for telegraph and club purposes the remainder of the building will be divided into offices.

If our readers will refer to *The Iron Age*, October 6, 1892, and compare the floor plan there given with those which are presented herewith, they will obtain an excellent idea of the manner in which the project has grown, as the result of the indefatigable efforts of the gentlemen who have had the matter in charge, who have been endeavoring to provide suitable quarters for what has been gradually developing into an association of much dignity and character. Many of the members of the club probably do not fully realize the measure of solidity, prominence and character represented by the names already on the roll, standing as they do for men well known to the trade and throughout the country as leading merchants and manufacturers, with not a few eminent in finance, law and other dignified vocations.

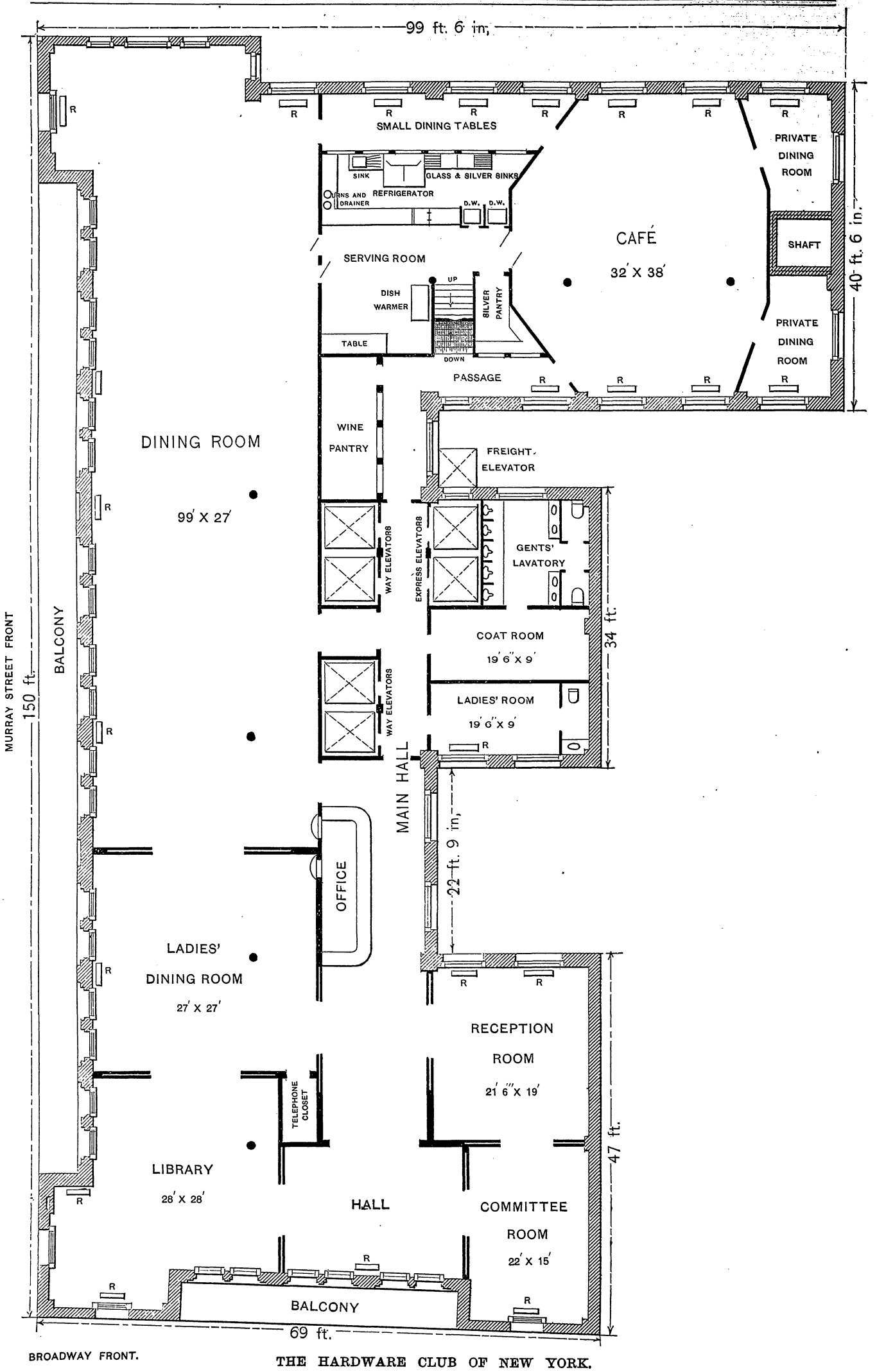
When the club is installed in its new home it is safe to say that the members will feel amply repaid for the delay in carrying out the project in the completeness, luxury and extent of the provisions for their comfort. The conditions of the club are such also that no re-establishing of themselves in larger quarters will be necessary in consequence of subsequent growth and expansion for a long time to come. The governors and committees, under the advice of accepted authorities in positions of responsibility in the best dining clubs of the metropolis, have very sagaciously provided for the present and anticipated future needs.

It will be remembered by those familiar with the subject that when the decision was made to enlarge the scope of the membership, reserving to the Hardware and related trades the government of the club, the direction of its policy and the control of its action, gentlemen connected with other lines of business were made eligible for membership. This step was taken with a view to providing better facilities than would have been possible except with a large revenue. It was believed that very many desirable persons could thus be secured as members, and the correctness of this view has since been demonstrated by the applications which have been received for membership from many gentlemen unconnected with the Hardware and kindred lines. The great majority of the members are, however, connected with the special branches of trade for which the club is specially intended.

The building itself is centrally located in the territory in which the Hardware and Metal trades are mainly concentrated, and is also conveniently accessible to a large number of the members of the club who are bankers, financiers, lawyers and merchants identified with other lines, city officials and prominent professional men in different walks of life. Situated as the club is on Broadway opposite the City Hall, it is easily reached by surface lines and elevated railroads, and is conveniently accessible to ferries, and is also but a few minutes' walk from the terminus of the New York and Brooklyn Bridge.

From the roof of the structure, which is covered with cement walks similar to those on the street, is afforded an inspiring view of both the North and East rivers, with their enormous commerce, of the harbor and lower bay, of the Narrows, forts, islands, &c. Following the course of the East River the Long Island Sound can be distinctly seen, while the famous Palisades of the Hudson are equally near. The building itself has been constructed of the best materials in the most substantial manner, and is a splendid example of modern architecture and improved appliances for the comfort and convenience of those who are especially concerned.

The opinion is expressed by an official of one of the best known dining clubs in the city that when the plans determined on and now in course of execu-




THE HARDWARE CLUB OF NEW YORK.

tion are consummated, the appointments and facilities of the club's quarters will be excelled by none in New York. While essentially a dining club, it will be possible to obtain a meal there at any time during the day from 7 a.m. until 7 p.m.

Entering the building from the street one will have a choice of six luxurious elevators which run to the top of the structure. Two of these will be express elevators, making their first stop at the eleventh story. Stepping from any of the elevators one finds himself in the main hall, which is 94 feet long, and one end of which opens out into a fine balcony on the Broadway front of the building.

MAIN HALL.

It is intended to make the main hall a leading feature of the club's quarters. For a considerable distance it is 14 feet wide, but near the front at the Broadway end, as shown in the plan herewith, it becomes 22 feet. It may be said here that the entire floor will be of stone of a reddish color. The hall will be carpeted or strewn with rugs. Settees, chairs, &c., will be distributed at intervals, the walls will be hung with pictures, and the whole court made very inviting and effective. Near the entrance to the hall proper on the Murray street side will be the office, with an official in charge.

COMMITTEE AND RECEPTION ROOMS.

At the left of the hall is what may be termed a reception room, 21½ by 19 feet in dimensions, while beyond it is another room, 22 by 15 feet in size, which can be used as a committee room. Both rooms are suitable for a number of uses, among which may be mentioned their adaptability for trade meetings, such as are often held in places of business, hotel parlors &c. On proper notice it will no doubt be feasible to obtain one of these rooms for such purposes, and should the meeting be protracted luncheon, dinner and supper can be expeditiously served there. Merchants will thus be free from interruption and can satisfactorily attend to the matters for the adjustment of which the meeting was called.

LIBRARY.

To the right of the hall, as shown in the plan, is the library, the greatest dimensions of which are 28 x 28 feet. This will be luxuriously fitted up with easy chairs, rockers, lounges, &c. The leading commercial, news and trade papers will be kept on file, and facilities given for correspondence or other use of the members. Here, also, it would be desirable to have for reference as complete a line of catalogues, price-lists and other trade literature as it may be feasible to collect. This room, overlooking the City Hall Park and having a southern exposure, with a view down Broadway, is not likely to prove unattractive.

LADIES' DINING ROOM.

Between the library and the main dining room is the ladies' dining room, the size of which is 27 x 27 feet. The principal entrance to this room will be from the large hall. It will be remembered that the original plan in regard to these premises did not contemplate having such a room, as the amount of space available did not permit it. The enlargement of the project, however, by which the kitchen and other apartments connected with the preparation of food were put in the structure on the roof, permits this important addition to the outfit of the club, the members of which will thus have a suitable place in which to entertain the lady members of their families when in the vicinity. It is needless to say that this will supply a long felt want, owing to the scarcity of such conveniences in a purely business district.

TELEPHONE.

It will be observed that between the ladies' dining room and the main hall the telephone closet is located. The importance of this adjunct will be appreciated, and with the long distance telephone members of the club will be in communication not only with houses in the city and vicinity, but with places out of town within a constantly enlarging circle.

THE DINING ROOM.

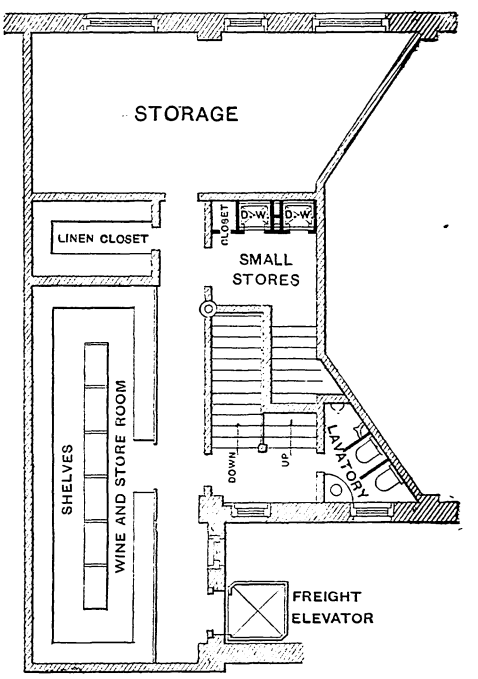
The main dining room will have an ample capacity, being about 99 feet long and 27 feet wide. It has been estimated that this room will comfortably accommodate about 300 persons at one sitting. There are four principal entrances to this room, not to mention those leading to the serving and similar rooms. The office, it will be seen, also opens into it. In this spacious room the annual club dinner will probably be served. With the floor richly carpeted and the furniture harmonizing with the mahogany cabinet work with which the whole premises will be trimmed, and with the extensive outlook to the South, there will be little to desire in the way of comfort and elegance. Light will be furnished from electric incandescent burners, and heat through radiators, the location of which is indicated on the diagram. Above the ceilings will be a spacious air chamber, through which air will be forced to counteract the superfluous heat during the summer months. All meal orders will be written and instantaneously transmitted through pneumatic tube service to the *chef* in charge of the preparing room. This will save much valuable time to the waiters. A glance at the diagram will discover how close contact with the serving room, silver, glass and wine pantries is secured. The table furniture will be in keeping with the character of the club as regards china, silver, glassware, linen, &c. The order for the linen, which will be of special design and will contain the club's monogram, has already been given.

BALCONIES.

Before leaving this part of the building the balconies on both the Murray street and Broadway sides should not be ignored. The aggregate length of both is 156 feet; the depth 4½ and 5 feet, respectively. They are easy of access, and in suitable weather will prove an excellent place in which to sit and chat. In the summer the windows will be equipped with awnings to afford protection from the sun's rays.

CAFÉ.

Continuing the circuit, the *café* is reached from the large dining room through the passage beyond the serving room, which is 7 x 28 feet. Presumably the majority of *café* patrons will go directly to that room on reaching the club floor through the main hall, which will be the principal thoroughfare for that purpose, but the hall or court above alluded to adds to the convenience and accessibility of its location. It has been suggested that in this passage one or more tables can be




*The Hardware Club.—Mezzanine Floor.*

placed at any time for an overflow from dining room or *café*, or for any who may prefer the isolation and seclusion thus obtained. Being near the western windows, the outlook, with a view of the North River, is an admirable one. The *café* itself is an eight-sided room, the greatest dimensions of which are 32 x 38 feet. Here a hurried or an informal meal can be enjoyed with greater freedom than would in the nature of things be expected in the main dining room.

PRIVATE DINING ROOMS.

It is about settled that the two irregular shaped rooms seen in the diagram beyond the *café* can be best utilized for private parties. Each is about 16 feet long and 8 feet wide, and if they are much sought after it is suggested that it may be necessary to charge a small amount for their use, with the purpose solely of insuring an equitable distribution of the privilege, unless some more satisfactory method can be devised.

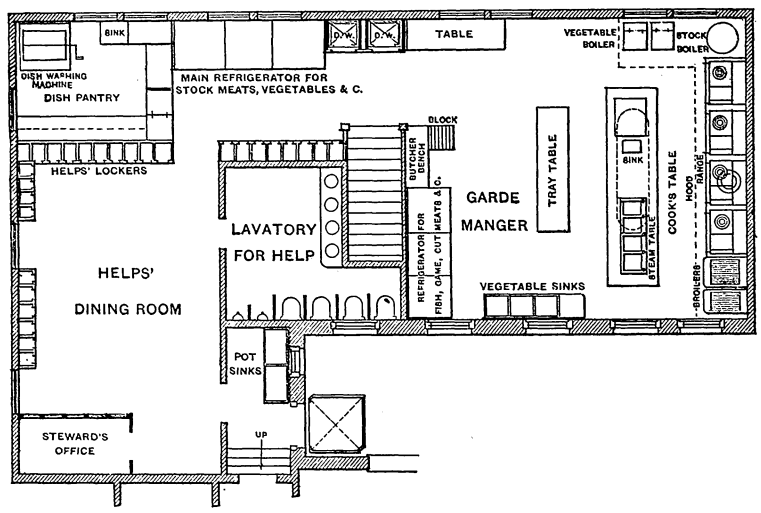
The coat, cloak and retiring rooms occupy the whole central wing of the building in which the two express elevators are. Here also are the lavatories, closets, &c. These conveniences are, it will be observed, ample. A freight elevator adjoining this wing will be devoted exclusively to the transportation of stores, packages, &c.

SERVING ROOM.

This room, it will be observed from an inspection of the diagram, is well situated for the uses for which it is intended. There are several means of ingress and egress, and a number of pantries for silver, glass, wine, &c. Two dumb waiters also will connect these rooms with the mezzanine floor and kitchen above.

MEZZANINE FLOOR.

The mezzanine floor is located just above the serving room and under the kitchen, but isolated from both except as reached by the staircase, by which access to the roof is also gained. This floor, as indicated, will be used mainly for storage.




*The Hardware Club.—Kitchen.*

KITCHEN.

The diagram of the kitchen practically explains itself. In a dining club the kitchen is, of course, of prime importance. An inspection of either the plan or the room itself will convince our readers that it is exceptionally complete. If things do not run smoothly in that department it will not be owing to the lack of modern labor saving devices and the requisite paraphernalia.

## II. THE MANAGEMENT OF THE CLUB.

The foregoing description and the accompanying illustrations will make it evident that the premises of the club are a fitting home and center for the trade of New York and vicinity, as well as for manufacturers and merchants in other parts of the country. In this connection it is pleasant to report the hearty support which is given to the project not only by Hardwaremen doing business in the city, but also by many representative manufacturing and jobbing houses in other parts of the country and by not a few retailers. Manufacturers and jobbers of New England, Pennsylvania, New Jersey, and adjacent States are well represented, as are also some of the largest jobbing houses in the West. Among the members are also many identified with the extensive exporting interests which center in New York, and it is expected that this class of trade will be largely represented in the club. This membership is regarded as especially desirable, as it will tend to bring manufacturers directly into contact with the many resident buyers of foreign houses and with the great export commission houses who have so influential a part in the distribution of American products to all parts of the world. The presence in the club of representative bankers, lawyers, city officials and others in various branches of trade more or less closely related to Metal interests will give the club character and strength. While the number of members already exceeds 300, it should be remembered that comparatively little effort has been made to induce persons to join the club, and the limit which has been assigned to the membership will no doubt soon be reached.

FURNISHING THE CLUB.

The matter of furnishing the apartments of the club is now receiving the careful attention of the House Committee, which consists of Messrs. McCARTEE, VARICK, BISSELL, VAN GLAHN and W. H. WILLIAMS, *ex-officio*. This work will be recognized as one calling for exceptionally good judgment and taste and for which the committee is well qualified. The plans contemplate furnishing the club with an elegant and complete outfit. In the meantime the Finance Committee, consisting of Messrs. WALKLEY, OGDEN and HAYDEN, is giving attention to the financial side of the matter with a view to providing the ways and means for the carrying out of the project.

CLUB FACILITIES.

Many of the members connected with the trades to which the club is especially devoted unquestionably regard it with favor in good measure because of the opportunity it will afford for acquaintance with other persons in the trade, as it will bring them together in a very pleasant way. This, however, is only one of the advantages which the club will possess, and besides the very useful purposes which it will thus serve there are more substantial ways in which it will be of advantage to those connected with it. Many of the members will undoubtedly find their business interests promoted by the opportunity which the club will afford for meeting with the trade in the city and many outside of it who will make the club their headquarters while in town. Merchants in the city will also find the club a very convenient and pleasant place to take their customers and others with whom they may have business relations, who by their introduction may be made at home in the club and given the privileges of membership for a time. The rules relating to this matter have not been formally determined, but it is safe to assume that they will give the members all reasonable facilities in this direction, and thus make the club supply a want which has for a long time been felt. A similar privilege extended to non-resident members will enable them to introduce other members of their firm to the club, thus giving them an opportunity to enjoy its conveniences while they may be in the city. The carrying out of the plans which have been formed will render the club more and more a rendezvous for non-resident manufacturers and merchants who desire to keep in touch with the trade and appreciate the advantages offered by the organization. At the club can be received letters, telegrams, packages, samples, &c., appointments made and interviews had, with a certainty of always meeting at a common center a large number of persons who otherwise would have to be sought in their places of business. Arriving in town, hand packages, wraps and baggage can be left if desired, the soil of travel removed, and a meal partaken of at any time during the day. This may occupy much or little time at the convenience of the member, while pending the preparation of the meal the intervening time can be occupied in various ways not possible at hotel or restaurant. It has, indeed, been suggested by one who looks at the thing in a very practical way that the saving to those visiting the city frequently in their hotel bills will soon more than cover the amount of the dues. Those in charge of the interests of the club recognize the desirability of having as large a non-resident membership as possible with a view to making the club as thoroughly representative of Hardware and Metal interests as possible. The more adequately and fully the trade is thus represented in the membership the more attractive and useful the club will be made.

THE DINING ROOM AND CAFÉ.

While the club will serve social purposes in a very pleasant way and be of practical business advantage, it must be remembered that it is primarily a dining club, and that it is at the noon lunch or dinner that the members will principally be brought together. Very much of the success of the club will unquestionably depend on the attention which is given to this matter and the practical way in which the views of the members in this regard are met. It is obviously desirable that the bill of fare should be sufficiently comprehensive to enable those who desire an elaborate dinner to obtain it of the very best quality and at reasonable charges, and that others who are accustomed to take a much less formal meal shall be able to obtain it as at least as moderate a price as elsewhere and amid all the comfort and elegance of the surroundings of the club. There is undoubtedly a wide difference in the practice of merchants in this regard, some devoting a considerable time and making a substantial meal at noon, while others prefer a very simple lunch, which is not infrequently hurried. Organized as the club is for the convenience of its members, it will be necessary for it to be conducted in such a way that these diverse views may be met and all be enabled to enjoy the privileges of the club without expending more than the usual amount for lunch or dinner.

If the plans of those in charge of the interests of the organization are carried out with the wisdom and success with which they have been elaborated, it is safe to say that after the club has been in operation for a time, the trade will wonder how they ever got along without it.

### III. VIEWS OF WILLIAM H. WILLIAMS.

A representative of *The Iron Age* called on William H. Williams, the efficient president of the Hardware Club, and was favored with the following remarks in regard to the scope of the club and the position it will assume in the trade:

It is pretty good evidence of the desirability and utility of the scheme for having here in New York a representative Hardware club that your journal, which has never encouraged visionary or impracticable enterprises, has given to the club a consistent and unwavering support since the idea was first suggested. There are many reasons for the existence of such a club which will occur to your readers, a few only of which I will mention. Many of the great industries centered here in New York have their boards of trade or exchanges where those interested meet daily either for the transaction of business or for the exchange of useful information; but the Hardware trade, which certainly is a most important industry not only in New York, but throughout the country, has never enjoyed such advantages. For obvious reasons the products and commodities in which it deals cannot well be marketed through the medium of an exchange of the character of the Produce, Cotton or Stock exchanges, but those who conceived the idea of having a Hardware club were at the time deeply impressed with the desirability of having a common and daily place of meeting, where we could get better acquainted with each other, where information affecting the various interests relating to the trade might be exchanged, and members might meet their local customers or those with whom they have business relations who are temporarily stopping in the city; where, in fact, mutual interests might be organized effectively for the common benefit of all. The most practicable means of accomplishing this seemed to be through the medium of a lunch or dining club, and the more the idea has been considered, the more confidence those who have originated it have in its feasibility. At the outset two things became apparent: 1, That such a club would be useless, or nearly so, if conducted on any other than a first-class basis, and, 2, that as the center of our trade here in New York is in close contiguity to other departments of business it would be advisable to associate with us such of the leading bankers, professional and business men in our vicinity as would be willing to join our club for the purpose of having a comfortable and satisfactory place to lunch, at the same time retaining for the club in its name and purpose the essential characteristics of a trade organization. These objects, we confidently believe, we shall attain in the really palatial home which the club has secured for itself in the new Postal Telegraph Building. A competent and well qualified House Committee has given much attention to the details pertaining to all the appointments of the club, and I am sure the membership will be proud of their club when it is fairly settled in its permanent domicile. I am very glad to see that so many gentlemen connected with our trade who only visit the city occasionally are associating themselves with the club as non-resident members. They will certainly find it a convenient place for meeting their New York friends and acquaintances, while the advantages in other respects that it will afford them during their sojourn here will, I am sure, be keenly appreciated. As an evidence of how firm a hold the idea of having such a club has upon the Hardware trade I need only refer to the fact that during the trying season through which we have just passed, which has scarcely been paralleled in the history of the country, we have not only held, but have increased our membership, and that, too, without having any regular meetings or any place for holding such meetings. In common with all the members of the club, I feel grateful to *The Iron Age* for its hearty co-operation, and am pleased to think it will find its reward in the abundant success of the enterprise which it has so generously fostered.

## Trade Items.

WILLIAM G. HIBBARD, president of Hibbard, Spencer, Bartlett & Co. of Chicago, sailed from San Francisco on the 17th inst., bound for a tour round the world. On his way across the Pacific Ocean he will make a brief stay at the Sandwich Islands. He is accompanied by his two sons. Mr. Hibbard has been closely confined to his desk for years, looking after the multifarious details of his great establishment, and has richly earned the recreation which he is now enjoying. His many friends in the Hardware trade wish him a most enjoyable trip and a safe return.

PARKHURST & WILKINSON of Chicago, jobbers of Heavy Hardware, have at length secured the discharge of their assignees, and state that all accounts made in the name of the latter will be settled by the firm. They have put in the hands of a trustee sufficient real estate and other outside property to meet all deferred payments, so that they have their stock of merchandise and accounts receivable clear, as a working capital. They will continue business in their old lines of staple Heavy Hardware, Iron, Steel, Carriage and Sleigh Goods, Bicycle Makers' Supplies, Miners' and Smelters' Goods and Railroad Supplies. The firm have had the sympathy of the trade in their financial misfortunes, and the news of their settlement will be received with pleasure.

THE PENNSYLVANIA BOLT & NUT COMPANY, Lebanon, Pa., are now making a specialty of refined Bar Iron, also of Electrical and Structural Forgings, in addition to their former lines. The line of Forgings include Arch Bars and Body Bolsters, Car Forgings, Anchor Bolts, Stirrups, Brake Levers, Link Pins, Punched and Bent Plates, Tie Rods for cable and electric roads, Forgings for electric railways, Arm Braces for telegraph poles, Bridle Irons and the various forgings incidental to structural work. Their product of Cold Punched Chamfered and Trimmed Nuts has also been largely increased during the past year.

E. C. STEARNS & Co., Syracuse N. Y., announce in their circular that customers can obtain Stearns' bicycles of 1894 models for the holiday trade. Reference is also made to the achievements of John S. Johnson on a Stearns wheel at Independence, Iowa, and letters are given from riders using these machines. In this connection the manufacturers remark that while Johnson rides a racer its model is not for his exclusive use, and that as many of a like pattern as are ordered will be promptly supplied at the regulation price.

GEORGE W. GRAHAM, 88 Chambers street, New York, is sole agent for Robinson's Cement, manufactured by the Robinson Cement Company, New York. This is a preparation for mending china, glass, crockery, stone, marble, ivory, wood, &c. It is said to be made according to the same formula used orignally 40 years ago. It is put up in glass bottles, packed one dozen in a suitable box. It is intended largely for family use, as a handy composition for repairing the numberless fractures incidental to housekeeping.

AMONG CYCLING CIRCLES it is expected that the six day race to be held at Madison Square, New York, during the holiday week, will be the greatest cycling contest ever held. It is understood that the programme for the short distance races has not yet been arranged, but that substantial prizes will be offered, and that there will be a number of races run each evening.

KINSLEY IRON & MACHINE COMPANY, Canton, Mass., issue a circular which illustrates two patterns of Calking Vises, Kinsley and Skiff, which, it is stated, are made from best Iron and are furnished with one beveled and two plain jaws of a high grade of Steel, carefully tempered. The rocker bolt is of Steel, held in place by a Steel set screw. It is claimed that the Vises throughout are made in the best possible manner.

G. & H. BARNETT, Philadelphia, Pa., proprietors of the Black Diamond File Works, are sending, with their compliments, Aluminum Cigar Cases for pocket use. On both sides of the Case is a reproduction of their trade-mark —a File in a diamond of black enamel —together with name, address, &c. The Case holds four cigars and is a pleasant reminder of Black Diamond Files.

THE BILLINGS & SPENCER COMPANY, of Hartford, Conn., have opened a Chicago branch at 59 South Canal street, with W. A. Davis in charge as Western manager. This is in the same store with the Prentiss Tool & Supply Company, and the latter will attend to retail city orders, while Mr. Davis will devote himself to handling the business of the trade in general. They show a full line of samples of their specialties, including Machinists' Hammers, Pipe Wrenches, Ratchet Drills, Combination Pliers, Wire Cutters, Beam Calipers, Surface Gauges, Dies and Die Stocks, Machinists' Clamps, Screw Drivers, &c.

WILLIAM BAILEY, who had the distinction of being the oldest maker of Nails in the world, died at his home in Melrose, Mass., November 21, 1893. He was over 92 years of age, having been born in 1801, at Newburyport, Mass. When 12 years of age he apprenticed himself to a blacksmith and learned to make Nails by hand. This line of business he followed all his life, and at the time of his death was largely interested in the manufacture of Nails and Iron. He was the inventor of many improved machines for use in the manufacture of Nails.

IN THEIR ADVERTISEMENT in this issue the Clement Silver Flatware Company, Unionville, Conn., illustrate their ware, which is referred to as a substitute for solid silver. It is explained that there is no plating to wear off and no rusty edges, while the cost is no more than similar goods. A sample dozen will be sent on approval to any house in the United States with prices and discounts.

ANNOUNCEMENT IS MADE that the interest of F. M. Woolworth in the firm of Kelly & Woolworth, Niagara Falls, N. Y., has been purchased by H. W. McBean. The business will be continued by Kelly & McBean on an enlarged scale and with increased manufacturing facilities. It is intimated that a special effort will be made to fill orders promptly and at the lowest prices.

S. S. SURDAM of Oyster Bay, N. Y., has purchased of H. D. Heath, Candor, N. Y., his interest in the Hardware part of his business. Mr. Heath will continue the sale of Agricultural Implements, Phosphates, Lime, Cement, &c.

THE FIRM of Beato & Calle, agents for the sale of Hardware and Machinery, Matanzas, Cuba, were recently dissolved by mutual consent. Victoriano de la Calle is now carrying on the business under his own name.

THE NATIONAL MFG. COMPANY, Wilkesbarre, Pa., have opened an office and warehouse at 87 Liberty street, New York, which will promote the convenience of the trade in this vicinity.

S. R. DROESCHER, 58 Warren street, New York, quarrier and importer of Razor Hones, Oil Stones, &c., announces he has opened a new establishment at the above address. He alludes to the fact that he carries in stock a full and complete assortment of Razor Hones and Oil and Scythe Stones. He adds that through European connections he is able to bring out on importation orders any special articles of this nature at lowest rates.

## Price-Lists, Circulars, &c.

BLAIR MFG. COMPANY, Springfield, Mass.: Lawn Mowers, &c. A handsomely printed catalogue illustrates with descriptions and prices the Easy, Archimedean high wheel, Hercules high wheel, Bay State, style B, Lawn Razor, style B, Leader, style B, Archimedean horse-power and the Mohawk, style B, Lawn Mowers; California Lawn Sprinkler, Revolving Turf Edger, Lawn Rakes, Model Lawn and Garden Roller and Lawn Sweepers. The manufacturers remark that for the first time during the 15 years they have been engaged in the manufacture of Lawn Mowers and Lawn specialties they now present under one cover a complete list of the different styles of Lawn Mowers, &c., of their production; and that their line of Mowers includes both front cut roller and rear cut side wheel machines of varying hight of wheels and number of revolving knives. The point is emphasized by the makers that in the manufacture of Mowers they apply the principle of exact duplication of different parts of the finished product, by tools and fixtures specially designed and adapted to the work to be done; and that as a result they are able to produce Mowers of superior mechanical construction at the lowest possible cost. It is further stated that they make but one quality—the best—and that any product of their works is warranted to be the highest grade of its kind; also that no order is too large or too small to receive their careful attention. Their European agents are Markt & Co., New York, London and Hamburg.

SILVER & CO., 20 Warren street, New York, and 304-310 Hewes street, Brooklyn: Household Inventions. Large illustrated circulars show Fruit Strainers, Egg Beaters, Soap Cups, Measuring Glasses, Flour Bin and Sifter, Gas Burner Stoves, Spirit Stoves, Steam Cookers, Cooking Crock, Display Stands, Yankee Roach and Beetle Trap, Coffee and Tea Pots, Novelty Gas Heaters, Royal Roasting and Baking Pans, &c.

GEORGE CHASE, 107th street and First avenue, New York: A reduced price-list, under date December 1, 1893, relates to best White Washita, Washita mounted in polished cases, Green Paper grade, and Arkansas Stone. In addition are Arkansas, Scotch and Hindostan Dental Wheels, Regarding Chase's Green Paper brand of Washita Stone, it is remarked that the Stone is carefully selected as to its cutting qualities, being of a soft, even, fast cutting grain.

FLORENCE DISPLAY FIXTURE COMPANY, Geo. H. Bennett, proprietor, 204 Lake street, Chicago, Ill.: Store Display Fixtures. One catalogue illustrates their regular line of standard fixtures, which are always carried in stock. These include Stands, Cutlery and Plate Glass Brackets, Post Bands for iron columns, over counter fixtures, fixtures in shape of letters, &c. Another catalogue shows new and accurate designs of fixtures, the leaves being secured by silken cords to allow the addition of extra leaves. The manufacturers state that their work is all first class and absolutely original. They are prepared to make designs for any style of window or display. The plates in this catalogue show elaborate and handsome designs of fixtures, many with electric lights in them.

THE COLUMBIAN SILVER FLAT WARE COMPANY, Unionville, Conn.: Solid Columbian Silver Flat Ware. The goods made of this substitute for solid silver include Knives, Forks and Spoons. The ware is described as being nearly as white as sterling silver and it is stated that with as careful use as sterling silver it will outlast any flat ware on the market. It is claimed that the knives are as good cutters as solid steel Knives, and that they never show any rust, and that they can be sharpened at any time. The manufacturers warrant the goods manufactured from the metal 25 years to wear as white as sterling silver, to hold a temper equal to silver, and never to show any signs of rust. Illustrations of the goods are shown in various patterns.

LUDLOW-SAYLOR WIRE COMPANY, St. Louis, Mo.: United States Wire Mats and Matting. The Mats are made in regular, circular and irregular shapes. The Matting is made in 50 and 100 feet rolls, 16 to 48 inches wide, or wider if desired. It is explained that rolls can be cut to any required lengths by cutting one wire in two places; that it rolls up close, is elastic, flexible, cleanly, of heavy wire, and that it is so woven as to form a good scraping surface in any position. The point is made that remnants can be worked into regular sizes of domestic Mats.

GRAND CROSSING TACK COMPANY, Grand Crossing, Chicago: New goods. An illustrated pamphlet is devoted to 5-cent goods put up by this company, including Hammer Carpet Tacks, Claw Handle Carpet Tacks, Bonnie Blue Tacks, Bill Nye Brad Box, Just Enough Brass Nails, Double Enough Cobblers' Nails, Wood Keg Carpet Tacks, Gilt Nails, Centum Carpet Tacks, Austral Steel Tacks and House Tacks.

HOLMES, BOOTH & HAYDENS, 25 Park place, New York: McGill's Patent Fasteners. Illustrated circulars show flat head, fancy capped shade and split shank Fasteners; Fastener and Staple Presses, Pin Fasteners, assorted Fasteners in caskets, card and calendar Suspending Rings, Adhesive Suspending Hooks and Eyes, round head, adhesive, H flat head and capped Fasteners, &c., also solid headed embossed Fasteners, gilt, silvered, bronzed and japanned. Over 200 patterns and sizes of these goods are made, designed for fastening and binding papers of all descriptions, sampling goods, &c., making paper and light wooden boxes, baskets and all descriptions of light binding.

## Trade in Pittsburgh.

FROM Logan, Gregg & Co., Pittsburgh, Pa., we have the following advices in regard to the condition of the Hardware trade in that market:

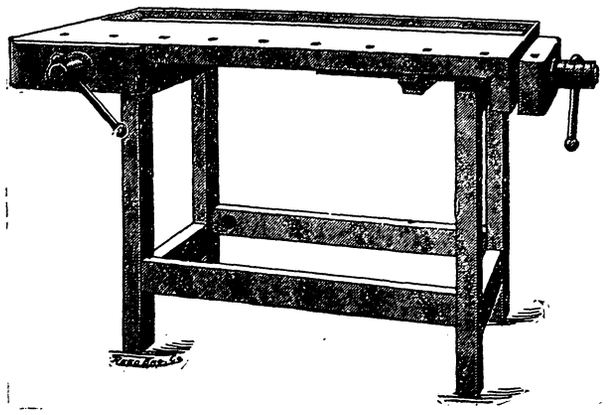
There is a better feeling among the trade since the emphatic expression of popular opinion in favor of a protective tariff at our recent elections.

Gradually more men are finding employment as our mills and factories resume operations, and this is having a favorable effect on the purchasing power of the retail storekeepers, many of whom have had to carry their customers through the stoppage.

There is, however, a very conservative feeling, and orders, though more frequent, are for immediate wants. So far there have been very few failures among the Hardware trade in this vicinity.

### Youths' Bench.

The Grand Rapids Hand Screw Company, Grand Rapids, Mich., are offering a youths' bench, as shown in the



*Youths' Bench.*

accompanying illustration. The bench is 20 inches wide, with 13-inch glued up maple top, and is 4 feet 6 inches long over all. It has both front and tail vise and holes for stops. Its hardwood frame is securely put together with joint bolts. The bench is made in two hights—30 and 32 inches. The bench is specially designed for use in manual training schools, but we are advised by the makers that quite a number have been sold to hardware dealers, some of them intending to sell them for the holiday trade.

### Pittsburgh Mammoth Lamp Fount.

The Pittsburgh Brass Company, Pittsburgh, Pa., with New York office 36 Park place, are offering the Mammoth lamp fount herewith shown. The lamps are made in three sizes, the largest size, known as No. 3, being shown in the cut. This fount, it is stated, holds over 8 pints of oil, sufficient to yield a brilliant white flame for over ten hours. All sizes of founts are furnished with an indicator, represented by the dial in Fig. 2. The pointer of the dial is attached to a spiral brass ribbon, incased within a brass tube. A float on the tube engages with the ribbon and turns the

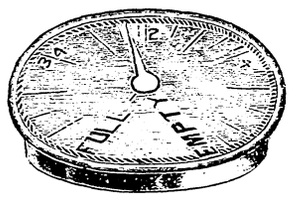



*Fig. 2.—Indicator Dial.*

pointer as it rises or falls with the oil. It is explained that the dial shows at a glance not only when the fount is full, thus removing danger of overflowing when filling, but also indicates the exact quantity of oil in the fount at all times. The founts may be stood on the base or used in connection with a harp. It is claimed by the makers that the lamp gives a large amount of light, that it is clean and easy to manage, that it does not break chimneys, and that it burns a long time without refilling.

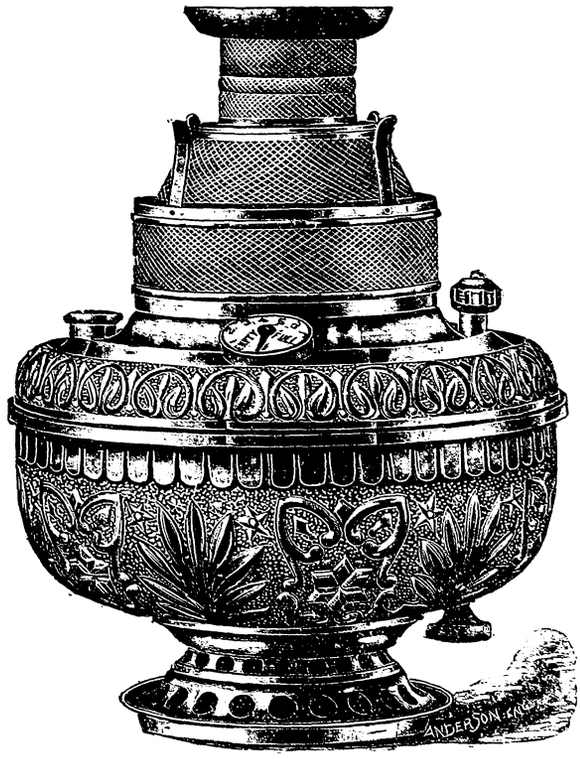


*Fig. 1.—Pittsburgh Mammoth Lamp Fount.*

### The Willer Sash Lift.

Willer Mfg. Company, Fourth and Cedar streets, Milwaukee, Wis., are introducing the sash lift, a full size cut of which is shown in Fig. 1. Two lifts are screwed to the stiles of both the

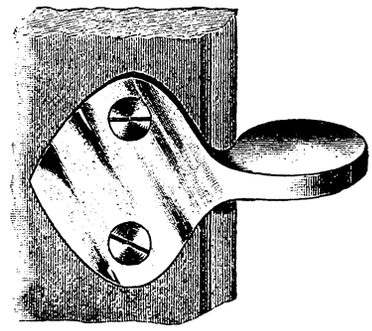


*Fig. 1.—The Willer Sash Lift.*

lower and upper sash in the positions shown in Fig. 2. The lower sash can be raised and moved as desired, while especial emphasis is placed upon the fact that by the aid of the lifts on the upper sash it can be lowered and raised up so as to shut tightly against the top jamb of the window, thus allowing the sash lock to be easily closed. The lifts

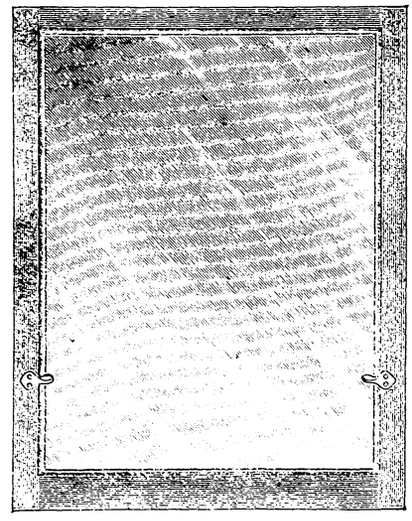


*Fig. 2.—The Willer Lifts on Sash.*

are furnished in Berlin bronze, brass, genuine bronze, old copper finish and nickel plated.

The value of real estate in New York City shows no signs of declension. A downtown surety company last week paid the enormous price of $387,500, or $273 per square foot, for a small lot at the corner of Broadway and Pine street. It should be stated, however, that special circumstances governed this transaction.

The Secretary of Agriculture in his report just submitted to the President states that there are in the United States 6,000,000 farms, upon which dwell more than 30,000,000 people, who furnish 74 per cent. of the value of exports of this country.

### Riding Horse Tricycle.

The cut herewith shown represents a riding horse tricycle, being introduced by the Riding Horse Tricycle Company, rooms 10 and 11 Grand Opera Block, Canton, Ohio. The body is stamped from sheet metal, and is mounted on rubber tired wheels. The rider, seated in the saddle 2 feet from the ground, guides the tricycle by means of the reins and propels the vehicle as he would a bicycle, the legs of the horse responding to each revolution of the pedals, giving, it is explained, an exact reproduction of the horse's action in trotting. The horse in described as being 36 inches high, painted in desirable colors, with neat saddle, bridle rein and neck collar, and as having natural mane and tail. The horse is designed for the use of children from three to ten years of age.

*Riding Horse Tricycle.*

### Expansion Bolts.

The Steward & Romaine Mfg. Company of 123 North Sixth street, Philadelphia, have added to their line the new double and single expansion bolts herewith illustrated. Cut No. 1 shows a double parallel expansion bolt, consisting of an ordinary square headed bolt with upper and lower nuts and expansion cases. The nuts are round, with V-shaped ends. The upper nut is loose and without thread, while the lower nut is threaded. Each nut is provided with two small lugs which fit into holes of corresponding size in the casings. In use the article to be fastened is placed in position and the bolt inserted in the hole in the masonry or other material. By turning the head of the bolt the nuts are drawn toward each other with a parallel movement and expansion thereby effected. The nuts being locked to the expansion cases by means of the lugs, it is claimed there can be no slipping, and a perfectly firm and reliable fastening is obtained.

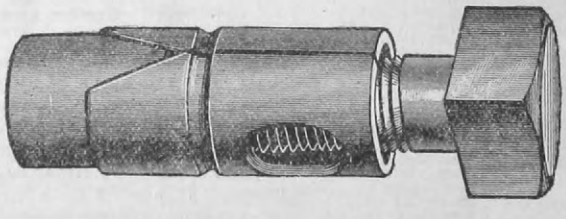


*Fig. 2.—Single Expansion Bolt.*

Cut No. 2 shows a single expansion bolt. In this bolt a threaded nut only is used. The casing is locked to the nut as in the double bolt, and expansion is effected at the bottom of the hole only.

### Exhibit Stand.

Silver & Co. of 20 Warren street, New York, and 304-310 Hewes street, Brooklyn, are putting on the market wrought iron stands for the exhibition of whatever goods a tradesman may have for sale. The illustration presented shows one of the exhibition stands displaying their Royal roaster. The stands are made with three or four uprights and with different number of shelves. They are japanned in different colors and ornamented. The stands are adapted for the display of crockery, hardware, household goods, and, shown with a line of Britannia tea pots, present a handsome appearance. They are made in standard sizes, and are given to the trade in consideration of orders for an assortment of the Royal roasters and bakers. Special sizes can be furnished if ordered in sufficient quantity.

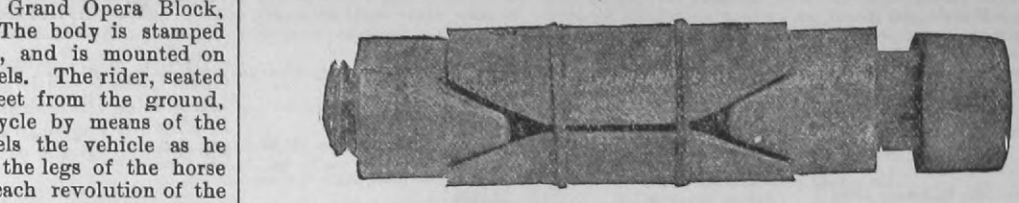


*Fig. 1.—Double Expansion Bolt.*


*Exhibit Stand.*

# Current Hardware Prices.

## NOVEMBER 29, 1893.

*Note.*—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

The character @ is used to indicate a range of price; thus discount 50&10@50&10&5 % signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

### Adjusters, Blind—

Domestic.....₩ doz $3.00, 33⅓@33⅓&10%
Excelsior....₩ doz $10.00.....50&10&2%
North's.....list net @ 10%
Zimmerman's—See Fasteners Blind.

### Ammunition—See *Caps, Cartridges, Shells, &c.*

### Anvils—

Am. Wrought, Horse shoe brand.11@11½¢
Armitage's Mouse Hole.....10½@11¢
Eagle Anvils, ₩ ℔ 9¢.....15@15&5%
Moore & Barnes Mfg. Co ..... 33⅓%
S. & H., machine finished..10½¢@11½¢
Trenton .....10@10½¢
Wilkinson's.....10½@11¢
Peter Wright's.....11@11½¢

### Anvil Vise and Drill—

Allen Anvil and Vise $3.00.....40&10%
Cheney Anvil and Vise.....25%
Millers Falls Co., $18.00.....20%
Star .....45&5%

### Apple Parers—See *Parers Apple, &c.*

### Augers and Bits—

Boring Machine Augers.....70@70&10%
Car Bits, 12-in. twist.....50%
Common Augers and Bits.....70@70&10%
Cincinnati Bell-Hangers' Bits.....30&10
Forstner Pat. Auger Bits.....15%
Jennings' Pattern Car Bits.....40%
Jennings' Pattern Auger Bits.....60%
C. E. Jennings & Co., No. 10, extension lip .....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, ₩ set 32½ quarters, No. 5, $5; No. 30, $3.50.25%
Russell Jennings' Augers and Bits.25&10%
Lewis' Patent Single twist.....45%
L'Hommedieu Car Bits.....15&10%
Pugh's Black.....20%
Pugh's Jennings Pattern.....30%
Snell's Bits.....60&5%

### Bit Stock Drills—

Cleveland .....50&10&5%
Cincinnati, for wood.....30&10%
Cincinnati, for metal .....45&10%
Morse twist Drills.....50&10&5%
Standard.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%

### Expansive Bits—

Clark's small, $18; large, $26..35@35&10%
Ives' No. 4, ₩ doz. $60.....40%
Steer's, No. 1, $26; No. 2, $18.....35@40%
Stearn's No. 2, $48.....20%
Swan's.....40%

### Gimlet Bits—

Bee .....25@25&5%
Common .....₩ gross $2.75@$3.25
Diamond.....₩ doz $1.25....40&10%
Double Cut:
Shepardson's.....45@45&10%
Ct. Valley Mfg. Co.....30&10%
Hartwell's.....₩ gro., $10.00..40&10%
Douglass'.....40&10%
Ives.....60@60&10%

### Hollow Augers—

Bonney's Adjustable, ₩ doz $48.....50%
Cincinnati Adjustable.....25&10%
Cincinnati Standard.....25&10%
Douglass'.....33⅓@33⅓&10%
French, Swift & Co. (Beecher).....33⅓@33⅓&10%
Ives' .....33⅓@33⅓&10%
Ives' Expansive, each $4.50.....50&5%
Stearns'.....20&10%
Universal Expansive, each $4.50.....20%
Wood's.....25@25&10%

### Ship Augers and Bits—

L'Hommedieu's.....15&10@15&10&5%
Snell's.....25@25&10%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10&5%
Watrous'.....25@25&10%

### Awl Hafts—See *Hafts, Awl.*

### Awls—

Awls, Sewing, Common....₩ gr. 85¢@90¢
Awls, Should. Peg.....₩ gr. $1.50@$1.55
Awls, Pat. Peg.....₩ gr. 35¢@38¢
Awls, Shouldered Brad..₩ gr. $1.30@1.40
Awls, Handled Brad....₩ gr. $2.50@$3.00
Awls, Handled Scratch..₩ gr. $4.00@4.50
Awls, Socket Scratch..₩ doz. $1.10@$1.20

### Awl and Tool Sets—See *ets, Awl and Tool.*

### Axes—

| | Plain. | Beveled. |
|---|---|---|
| First quality, best brands | $7.00 | $7.50 |
| First qual., other brands | 6.50 to 6.75 | 7.00 |
| Second quality | 5.50 | 6.00 |

### Axle Grease—See *Grease, Axle.*

### Axles—

No. 1.....3¼@4¢; 4½¢@5¢ } 3% cash
Nos. 7 to 14.....70%
Nos. 15 to 28.....47½%
Nos. 19 to 22.....70%
Concord Axles, loose collar.. 4½¢@5¢
Concord Axles, solid collar.. 5¢@6¢

### Bag Holders—See *Holders, Bag.*

### Balances—

Spring Balances.....40%

| | No. 2000 | 20 | 30 |
|---|---|---|---|
| Chatillon, ₩ doz | $0.80 | 0.95 | 1.75 net |

Chatillon Straight Balances.....40%
Chatillon Circular Balances.....50&10%

### Barb Wire.—See *Wire, Barb.*

### Bars—

#### Crow—

Cast Steel.....₩ ℔ 3½¢
Iron, Steel Points.....₩ ℔ 3¢

### Basins, Wash—

Standard Fiberware, No. 1, 10½-in., $1.80; 12-inch, $2.00; 13¼-inch, $2.50; 15-inch, $3.00.

### Beams, Scale—

Scale Beams, List Jan. 12, '82..50&10@50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%
Custer's.....33⅓%

### Beaters—

#### Egg—

Bryant's.....₩ gross $14.00
Double (H. & R. Mfg. Co.), ₩ gro., No. 0 $12.00; No. 1, $15.00; No. 2.....$36.00
Dover.....₩ doz $1.00@$1.20
Dover (Standard Co.).....₩ doz $1.00
Duplex (Standard Co.).....₩ doz $1.00
Duplex Extra Heavy (Standard Co.)... ₩ doz. $3.50
Easy (H. & R. Mfg. Co.).....₩ gro $12.00
Improved Acme (H. & R. Mfg. Co.).... ₩ gro. $9.00
Silver & Co.....₩ doz $5.50
Spiral.....₩ gro $4.25 @ $4.50
Triple (H. & R. Mfg. Co.).....₩ gro $16.50

### Culinary—

Keystone, P. D. & Co., Each, No. 1, $1; No. 2, $2.....20%

### Bells—

#### Cow—

Common Wrought.....60&10%
Dodge, Genuine Kentucky....70@70&10%
Kentucky Durham.....70&10%
Kentucky, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Texas Star .....50&10@50&10&5%
Western, Sargent's list.....70&10%

#### Door—

Crank, Brooks'.....50&10&2%
Crank, Cone's.....10%
Crank, Connel's.....20&10%
Gong, Abbe's.....33⅓&10%
Gong, Barton's.....40&10@50%
Gong, Yankee.....45&10%
Lever, R. & E. Mfg. Co's.. .....50&10&2%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Pull, Brook's.....50&10&2%

#### Electric—

Bigelow & Dowse.....20%
Wollensak's.....20%

#### Hand—

Extra Heavy Brass.....70%
Light Brass.....70&10@70&10&5%
Silver Chime.....33⅓&10%
White.....70%
Globe Cone's Patent).....25&10@35%

#### Miscellaneous—

Call.....45@50%
Farm Bells.....₩ ℔ 3¢&3½¢
Steel Alloy Church and School Bells..40%

### Bellows—

Blacksmiths'.....60&10&5@60&10&10%
Hand Bellows.....40&10@50%
Molders'.....40&10@50%

### Belting, Rubber—

Common Standard.....75@75&10%
Extra.....60&10@60&10&10%
Standard.....70&5@70&10%
N.Y.B.&P. Co., Carbon.....60@60&5%
N.Y.B.&P.Co., Diamond.....50@50&5%
N.Y.B.&P.Co., Para.....40@40&5%

### Bench Stops—See *Stops, Bench*

### Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....15%
Green River Tire Benders and Upsetters.....20%
Stoddard's Lightning Tire Upsetters..15%

### Bits—

Auger, Gimlet, Bit Stock Drills, &c., see *Augers and Bits.*

### Bit Holders—See *Holders.*

### Blind Adjusters—See *Adjusters, Blind.*

### Blind Fasteners—See *Fasteners, Blind.*

### Blind Staples—See *Staples, Blind.*

### Blocks—

Cleveland Block Co., Mal. Iron.60@60&10%
Moore's Novelty, Mal. Iron.....60%
Sure Grip Steel Tackle Blocks.....25%
See also *Machines, Hoisting.*

### Bolts—

#### Carriage, Machine, &c.—

Com. list June 10, '84.....80&10@80&20%
Genuine Eagle, Norway, list Oct. '84..... 80&5@80&10%
Eagle, Norway, list Oct. '84 80&10@80&15
Phila. pattern, list Oct. 7, '84..... 80%
R.B.&W., old list.....70%
Bolt Ends, list Jan. 1, 1890.80&10@80&25%
Machine, list Jan. 1, 1890..80&10@80&25%

#### Door and Shutter—

Cast Iron Barrel, Square, &c.....70&10%
Cast Iron Chain (Sargent's list)....65&10%
Cast Iron Shutter Bolts.....70&10%
Ives' Patent Door Bolts..60&10@60&10&5%
Wrought Barrel.....70&10@75%
Wr't B. K.Flush. Common..... 55&10%
Wr't Shutter, Brass Knob.....50@50&5%
Wr't Shutter, Sargent's list.....60&10%
Wr't Shutter, all Iron, Stanley's..... 60&10@60&10&10%
Wrought Square.....70&10@75%
Wr't Sunk Flush, Sargent's list....60&10%
Wr't Sunk Flush, Stanley's list.50&10&5%

#### Stove and Plow—

Plow.....60&10&5@60&10&10%
Stove.....60&10@60&10&10%
R. B. & W., Plow.....55%

#### Tire—

Common, list Feb. 28, '83.....65@65&5%
American Screw Company
Norway, Phila., list Oct. 16, '84.....75%
Eagle, Phila., list Oct. 16 '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....65%
Port Chester Bolt and Nut Company:
Empire list Feb. 28, '83.....65%
Keystone, Philadel., list Oct. '84.....80%
Norway, Phila., list Oct. '84.....75%
R. B. & W., Philadel., list Oct. 16, '84...80%

### Borers, Tap—

Common and Ring.....20&10%
Clark's.....33⅓@35%
Enterprise Mfg. Co.....20%
Ives' Tap Borers.....33⅓&5%

### Borax—

Per ℔.....9½@10½¢

### Boring Machines—See *Machines, Boring.*

### Bow Pins—See *Pins, Bow.*

### Boxes, Wagon—

Per ℔.....2¾¢

### Boxes, Miter.

Spiiker's Excelsior, 3 in. $7.50, 4 in $8.50, 5 in. $13.00, 6 in. $15.00.....20%

### Braces—

American Bit Brace and Tool Co.,
Nos. 10, 12, 20.....60&10%
Nos. 11, 21, 24, 27.....70&10%
Nos. 22, 23, 25.....60&10&5%
Nos. 13, 26, 36, 37.....70&10&5
Amidon's,
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Ratchet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10; 10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
Barber's.....50&10%
Bartholomew's,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Common Ball, American.....$1.00@$1.10
Davis Patent.....50&10%
Fray's Genuine Spofford's...50&5@50&10%
Fray's Nos. 70 to 120, 81 to 123, 207 to 414 50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barber's.....60&5%
Spofford.....60&5@60&10%
P. S. & W. Co., Peck's Patent.....60%
Rose & Johnson.....50%
Saxton's,
Barker's Imp. Polished.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet, Polished.....50&10@60%
Ratchet, Nickeled.....40&10@50%
Buffalo Ball.....net, $1.10@$1.15

### Brackets—

Shelf, fancy,
Sargent's list.....70@70&10%
Other makes at a wide range of prices.
Shelf, plain,
Regular, list.....65@70%
Sargent's list.....60&10@70&10%
Bradley Shelf Brackets.....70&10%

### Bright Wire Goods—See *Wire.*

### Broilers—

Henis' Self-Basting. { Inch..... 9 10 9x11
Per doz...$4.50 5.50 6.50
Morgan Odorless.....₩ doz. $12, 50%
New Haven.....50%
Queen City.....33⅓%
Wire Goods Co.....65&10%

### Buckets, Well—

#### Galvanized—

Helwig's Flat Iron Band.....$3.75
Helwig's Wired Top.....₩ doz $4.00
Hill's.....₩ doz. 12 qt. $4.25; 14 qt. $5.25
Iron Clad.....₩ doz. 14 qt. $4.25@4.50

### Bull Rings—See *Rings, Bull.*

### Butcher's Cleavers—See *Cleavers, Butchers.*

### Butts—

#### Brass—

Cast Brass, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%
Cast Brass, Tiebout's.....50%
Wrought Brass.....80@50&10%

#### Cast Iron—

Fast Joint, Broad.....50&10@60%
Fast Joint, Narrow.....50&10&5@60%
Loose Joint.....
Loose Joint, Japanned.....
Loose Joint, Jap. with Acorns..
Loose Pin, Acorns.....75&5@
Loose Pin, Acorns, Japanned...75&10
Loose Pin, Acorns, Japanned, Plated Tips.....&5
Mayer's Hinges.....
Parliament Butts.....

#### Wrought Steel—

Fast Joint, Broad.....
Fast Joint, Narrow.....
Fast Joint, Lt. Narrow.....
Inside Blind, Light.....
Inside Blind, Regular.....
Loose Joint, Broad.....
Loose Pin.....
Table Butts, Back Flaps, &c....
Bronzed Wrought Butts.....50@50&10%

List Jan. 2, 1893, 40@40&10%

### Cages, Bird—

Hendryx, Brass or Enameled.....50&10%
Hendryx, Wood.....40&10%

### Calipers—See *Compasses.*

### Calks Toe—

Burke's, One Prong, Blunt.....5½@6¢
Burke's, One Prong, Sharp.....6½@7¢
Burke's, Two Prong, Blunt.....7½@8¢
Gautier, One Prong, Blunt.....5½@6¢

### Can Openers—See *Openers, Can.*

### Cans, Milk—

S S. & Co.: 5-gal., $3.00; 8-gal., $4 40; 10-gal., $4.75 each.....40&10

### Cans, Oil—

Galvanized Blue Band, 1 gal., ₩ doz. $2.25
Galvanized Blue Band, 5 gal., Tip-Top, ₩ doz, $12.00
Galvanized Blue Band, 5 gal, Faucet, ₩ doz., $8.00
Glass Oil, Friend.....₩ doz. $2.75

### Caps—

#### Percussion—

Hicks & Goldmark's and Union Metallic Cartridge Co. ₩ 1000
Eley's E. B.....56@58¢
Eley's D Waterproof, Central Fire..$1 60
E. B. Grnd. Edge, Cent. Fire, 1-10's.....47@50¢
E. B. Trimmed Edge, 1-10's.....47@50¢
F. L. Waterproof, 1-10's.....35@37¢
G. D.....27@30¢
Musket. Waterproof, 1-10's.....50@53¢
S. B. Genuine Imported.....45¢

#### Primers—

Berdan Primers, $1.00.....2%
B. L. Caps (Sturtevant Shells) $1 00...2%
All other Primers, $1.20.....2%

### Cards—

Watson's Cotton, Wool, Horse and File, list January 28, 1891.....25%

### Carpet Stretchers—

See *Stretchers, Carpet.*

### Cartridges—

B. B. Caps, Con. Ball, Swgd., $2.00.....2%
B. B. Caps, Round Ball, $1.75.....2%
Blank Cartridges, except 22 and 32 cal., additional 10% to above discounts.
Blank Cartridges, 22 cal., $1.75.....2%
Blank Cartridges, 32 cal., $3.50.....2%
Cent. Fire, Military and Sporting 15&5&2%
Cent. Fire, Pistol and Rifle.....25&5&2%
Primed Shells and Bullets.....15&5&2%
Rim Fire Cartridges .....15&2&2%
Rim Fire Military.....15&2%

### Carpet Sweepers—

See *Sweepers, Carpet.*

### Casters—

Bed.....
Plate.....
Shallow Socket...
Deep Socket.....40&10%
Giant Truck Casters..... 35%
Gwinner's Common Sense.....45%
Gwinner's Hercules.....45%
Martin's Patent (Phœnix).45&10@50&10%
Payson's Anti-friction.....7¢@70&10%
Payson's Truck.....60@60&10%
Socket Truck Casters.....50@50&10%
Stationary Truck Casters.....50&10%
Tucker's Patent, low list..... 45%
Yale Casters, low list..... 45%
Yale, Gem.....70%

Brass.....55@55&10%
Others....60@60&10%

### Cattle Leaders—See *Leaders, Cattle.*

### Cement—

Victor Elastic.....5 ℔ pails ₩ ℔ 5¢

### Chain—

Trace, Wagon and Fancy Chains, List revised May, 1893.....60@60&10%
American Coil, in cask lots,

| 3-16 | ¼ | 5-16 | ⅜ | 7-16 | ½ | ⅝ | ¾ |
|---|---|---|---|---|---|---|---|
| $7.60 | 5.30 | 4.45 | 3.80 | 3.65 | 3.60 | 3.40 | 3.25 |

Less than cask lots, add ½¢@½¢ ₩ ℔
German Coil, list July 12, 1892 60@60&10%
German Halter Chain, list July 12, 1892. 60@60&10%
Barnes' Reinforced Sash.....60&10¢
Barnes' Victor Sash.....65¢
Covert Halter.....60&2%
Covert Heel Chain.....50&2%
Covert Traces.....35&2%
Galvanized Pump Chain.
5 ton lots.....₩ 100 ℔ $5.50
1-ton lots.....₩ 100 ℔ $5.75
500-℔ lots.....₩ 100 ℔ $6.75
Less than 500 ℔.....₩ 100 ℔ $7.00
Jack Chain, Iron and Brass, list July 10, 1893.....60&10%
Oneida Halter Chain.....60@60&5%

### Chalk—

See also Crayons.
Blue, case lots...₩ gr 75¢; small lots 80¢
Red, case lots...₩ gr 67¢; small lots, 72¢
White, case lots, ₩ gr 50¢; small lots, 62¢

**Chalk Lines**—See *Lines.*

**Checks, Door—**
Unity....50%

**Chisels—**
**Socket Framing and Firmer**
Mix, New Haven, Ohio Tool Co., P. S. & W, Witherby....75&10@75&10&10%
Buck Bros....30%
Douglass....75@75&5%
Merrill....60&10@60&10&5%
L. & I. J. White....30@30&5%

**Tanged and Miscellaneous.**
Buck Bros....30%
Butchers'....$4.75@$5.00 to £
Cold Chisels, fair quality, ℔ ...14@16¢
Spear & Jacksons'....$5 to £
Tanged Firmers....50@50&10%

**Chucks—**
Beach Pat....each, $8.00....20%
Danbury....each, $6.00,30@30&5%
Graham Patent....33⅓%
Morse's Adjustable, each, $7.00,20@20&5%
Syracuse, Balz Pat....25%
Skinner's Patent Chucks.
Combination Lathe Chucks....33⅓%
Drill Chucks....15%
Independent Lathe Chucks....40%
Universal Lathe Chucks....40%
Union Mfg. Co.
Combination....40%
Independent....40%
Universal....40%
Victor....$8.50, 25%

**Churns—**
McDermaid Star Barrel Churn, each 6 gal., $2.60; 10 gal., $2.75; 15 gal., $3.00; 20 gal., $3.25.
Tiffin Union, each, 5 gal. $3.25; 7 gal., $3.75; 10 gal., $4.25.

**Clamps—**
Adjustable, Cincinnati....15&10%
Adjustable, Hammers....15@15&5%
Adjustable, Stearn's....30@30&10%
Barnes' Machinists' Clamps....33⅓%
Cabinet, Sargent's....70&10%
Carpenter's, Cincinnati....25&10%
Carriage Makers', P., S. & W Co...40&10%
Carriage Makers', Sargent's...75@75&5%
Eberhard Mfg. Co....40&5@40&10%
R. I. Tool Co.'s Wrought Iron....25%
Saw Clamps, see Vises, Saw Filers'.
Stearn's Adjustable Cabinet and Corner....30@30&10%
Warner's....40&10@40&10&5%

**Cleavers, Butchers'—**
Beatty's....40@40&5%
Bradley's....25@30%
Foster Bros....30%
New Haven Edge Tool Co.'s....40%
P., S. & W....33⅓&5@33⅓&10%
Schulte, Lohoff & Co....40@40&5%
L. & I. J. White....20&5%

**Clips—**
Baker Axle Clips....25%
Norway, Axle, ¼ & 5-16....65&5&5%
Norway Spring Bar Clips, 5-16...60&5&5%
2d grade Norway Axle, ¼ & 5-16....65&5%
Steel Felloe Clips....℔ lb, 5¢
Superior Axle Clips....66⅔&5@70%
Wrought Iron Felloe Clips....℔ lb, 5½¢

**Cloth and Netting, Wire**
—See *Wire, &c.*

**Cockeyes....50%**

**Cocks Brass—**
Hardware list (Globe, Kerosene, Lever Bibbs, Racking, &c.)....60&2@60&10

**Coffee Mills**—See *Mills, Coffee.*

**Collars Dog—**
Brass, Pope & Steven's list....40%
Chapman Mfg. Company, new list....40%
Embossed, Gilt, Pope & Steven's list, 30&10%
Leather, Pope & Steven's list....40%
Medford Fancy Goods Co....40&10@50%

**Combs Curry—**
American Curry Comb Co....33⅓@40%
Fitch's....50&10@50&10&10%
Kohler's Humane....℔ doz., $1.75
Kohler's Magic Oscillating...℔ doz., $2.00
Rubber, per doz., $10.00....25%

**Compasses, Dividers &c.**
Compasses, Calipers, Dividers.70&10@75%
Bemis & Call Co.'s
Dividers....65%
Calipers, Call's Patent Inside....55%
Calipers, Double....65%
Calipers, Inside or Outside....65%
Calipers, Wing....60%
Compasses....50&5%
Excelsior....50%
Starrett's
Combination Dividers....25%
Lock Calipers and Dividers....25%
Spring Calipers and Dividers....25&10%
Stevens & Co.'s....25&10%

**Coolers, Water—**
S. S. & Co.: 2-gal., $2.00; 3-gal., $2.50; 4-gal., $2.75; 6-gal., $3.40 each....33⅓%

**Coopers' Tools—**
See *Tools, Coopers'.*

**Cord— Sash—**
Braided, Crown Drab and Fancy, ℔ lb, 55¢....30%
Braided, Crown White, ℔ lb, 50¢...50%
Cable Laid Italian Sash....℔ lb, 19@20¢
Common....℔ lb, 8½@9¢
Common Russia Sash....℔ lb, 12½@13¢
Egyptian, India Hemp, Braided....26¢
India Cable Laid Sash....℔ lb, 11½@12¢
Massachusetts, White....25¢
Ossawan Mills—
Braided, Giant, Drab and Fancy, ℔ lb 35¢....10%
Braided, Giant, White, ℔ lb 30¢....20%
Patent, good quality....℔ lb, 10@11¢
Patent Russia Sash....℔ lb, 13½@ 14¢
Samson—
Braided, Drab Cotton....℔ lb, 42¢
Braided, Italian Hemp....℔ lb, 40¢
Braided, Linen....℔ lb, 56¢
Braided, White Cotton....℔ lb, 37¢
Semper Idem, Braided, White....26¢
Silver Lake—
A quality, Drab, 55¢....25%
A quality, White, 50¢....25%
B quality, Drab, 35¢....10%
B quality, White, 30¢....10%
Sylvan Spring, Extra Braided, Drab..39¢
Sylvan Spring, Extra Braided, White.34¢
Tate's Solid Braided—
Economy, Drab....℔ lb, 27¢
Economy, White....℔ lb 22¢
Hercules, Drab....℔ lb, 30¢
Hercules, White....℔ lb, 25¢
White Cotton Braided, fair...℔ lb, 23@24¢

**Wire Picture—**
Braided or Twisted....80&5@80&15%

**Corkscrews**—See *Screws, Cork.*

**Corn Knives and Cutters**
—See *Knives, Corn.*

**Crackers, Nut—**
Acme.
Japanned, ℔ gro., $30....50%
Nickel Plated, ℔ gro. $30....10%
Blake's Pattern, ℔ doz., $2.00....10%
Table (H. & B. Mfg. Co)....40%
Turner & Seymour Mfg. Co....50%

**Cradles—**
Grain....50&2@50&5&2%

**Crayons—**
White Crayons, ℔ gross....7@8¢
D. M. Stewart Mfg. Co.:
Metal Workers', ℔ gross, $1.75....25%
Railroad, ℔ gross, 2.00....25%
Rolling Mill, ℔ gross, 2.50....25%
Soapstone Pencils, ℔ gross,1.00....25%
See also *Chalk.*

**Creamery Pails**—See *Pails, Creamery.*

**Crow Bars**—See *Bars, Crow.*

**Curry Combs—**
See *Combs, Curry.*

**Curtain Pins—**
See *Pins, Curtain.*

**Cutters—**
**Meat—**
American....30%
Nos. 1 2 3 4 B 5
Each....$5 $7 $10 $25 $50 $60
Enterprise....25%
Nos. 10 12 22 32 42
Each....$3 $2.50 $4 $6 $15
Dixon's, ℔ doz.... ....40@40&5%
Nos. 1 2 3 4
$14.00 $17.00 $19.00 $30.00
Draw Cut, each:
Nos. 5 2 6 8
$50 $75 $80 $225....20@25%
Hale's, ℔ doz....70%
Nos. 11 12 13
$27.00 $33.00 $45.00
Home No. 1, ℔ doz., $26.00....55&10%
Little Giant, ℔ doz....40&10@50%
Nos. 305 310 312 320 322
$35.00 $48.00 $44.00 $72.00 $68.00
Miles' Challenge, ℔ doz....45@45&10%
Nos. 1 2 3
$22.00 $30.00 $40.00
Triumph No. 505, ℔ doz., $21.00..25@30%
Woodruff's, ℔ doz....40@40&5%
Nos. 100 150
$15.00 $18.00
Beef Shavers (Enterprise)....20%
Chadborn's Smoked Beef Cutter, ℔ doz., $66.00

**Slaw and Kraut—**
Tucker & Dorsey Mfg. Co.:
Kraut Cutters....40%
Slaw Cutters, 1 Knife, ℔ gross...$21.00
Slaw Cutters, 2 Knife, ℔ gross... 30.00

**Tobacco**
Acme....℔ doz., $20.00. 40%
All Iron....℔ doz., $4.25
Champion....20&10@30%
Nashua Lock Co.'s..℔ doz., $18.00, 50@55%
Sargent's....℔ doz., $24.00, 55&10
Wilson's....55%

**Washer—**
Appleton's....℔ doz., $16.00, 60&10%
Bonney's....30&10%
Cincinnati....25&10%
Johnson's....℔ doz., $11.00, 33⅓%
Penny's..℔ doz.,, Pol. $14 ; Jap'd, $16, 55%
Smith's Pat....℔ doz., $12.00, 20&10&10%

**Diggers, Post Hole, &c.—**
Cronk's Post Bars, ℔ doz., $60.00, 50&5@50&10%
Eureka Diggers....℔ doz. $12.00@$13.00
Fletcher Post Hole Augers, ℔ doz., $36.00, 20@20&10%
Gem, Improved ℔ doz..,$9.00@$10.00 net
Gibbs' Columbia....℔ doz., $13.00
Gibbs' Imperial....℔ doz., $7.50
Gibbs' National....℔ doz., $12.00
Gibb's Post Hole Digger....℔ doz., $15.00
Kohler's Hercules....℔ doz., $14.00
Kohler's Invincible....℔ doz., $12.00
Kohler's Little Giant....℔ doz., $18.00
Kohler's New Champion....℔ doz., $8.00
Samson, ℔ doz., $34.00....25@25&10%
Scheidler....℔ doz., $13.00
Shimer's Hollow Handle..℔ doz., $24.00, 50%
Vaughan's Post Hole Auger, ℔ doz., $8.50@$9.50

**Dividers**—See *Compasses.*

**Dog Collars**—See *Collars, Dog.*

**Door Checks—**
See *Checks, Door.*

**Door Springs—**
See *Springs, Door.*

**Drawers.**
Money, ℔ doz....$18@$20
Waddel's Improved, ℔ doz....$15.00

**Drawing Knives—**
See *Knives, Drawing.*

**Drills and Drill Stocks—**
Blacksmiths'....each $1.75
Blacksmiths' Self-Feeding, each $7.50, 20%
Automatic Boring Tools....$1.75@$1.85
Breast, Bartholomew's....each $2.50 25&10@40%
Breast, Millers Falls....each $3.00, 25%
Breast, P. S. & W....40&10%
Breast, Wilson's....30&5%
Chicopee Automatic Drill....20&10%
Goodell Automatic Drills....40&5%
Ratchet, Curtis & Curtis....30%
Ratchet, Ingersoll's....25%
Ratchet, Merrill's....20@20&5%
Ratchet, Moore's Triple Action...25&30%
Ratchet, Parker's....20@20&5%
Ratchet, Weston's....20@25%
Ratchet, Whitney's....20&10%
Whitneys Hand Drill, Plain, $11.00 ; Adjustable, $12.00....20&10%

**Twist Drills—**
Cleveland....50&10&10%
Diamond, W. & B....50&10&10%
Graham's Pat. Groove Shank.50&10&10%
Morse....50&10&10%
New Process....50&10&10%
Standard....50&10&10%
Syracuse (Metal list)....50&10%

**Drill Bits or Bit Stock Drills**—See *Augers and Bits.*

**Drill Chucks**—See *Chucks.*

**Dripping Pans—**
See *Pans, Dripping.*

**Drivers, Screw—**
Allard's Spiral, new list....25%
Brace Screw Drivers....25&10%
Buck Bros....30%
Buck Bros.' Screw Driver Bits...27½&5%
Clark's Pat....30@33⅓%
Cincinnati....25&10%
Champion....25&10%
Disston's....50%
Douglass Mfg. Co....20@20&10%
Ellrich's Socket and Ratchet..25@25&10%
Fray's Hol. H'dle Sets...No. 3, $12.00, 45%
Gay & Parsons....35%
Goodell's Automatic....50%
Knapp & Cowles
No. 1....60&20@70%
No. 2....60&10&10@70&5%
No. 3....60&5@60&10%
Nos. 4 and 00, Acme and Ideal...50&5@ 50&10&5%
Kolb's Common Sense..℔ doz., $6.00, 25&10%
Mayhew's Black Handle....50%
Mayhew's Monarch....45&10%
P. S. & W....70%
Sargent & Co.'s
No. 1, Forged Blade....60&10&10%
Nos. 20, 40 and 60....66⅔&10&10%
Screw Driver Bits, Parr's..℔ gross, $6.25
Screw Driver Bits....℔ doz., 50@75¢
Stanley R. & L. Co.'s
No. 64, Varnished Handles....65&10%
No. 86....70&10%
Stearns'....25&10&5%
Syracuse Screw-Driver Bits....30&30&5%
C. T. Williamson Wire Novelty Co....50%

**Egg Beaters**—See *Beaters, Egg.*

**Egg Poachers—**
See *Poachers, Egg.*

**Electric Bell Sets—**
See *Bells, Electric.*

**Emery**—No. 4 to No. 54 to Flour, CF

| | 46 gr. | 150 gr. | F.FF. |
|---|---|---|---|
| 10-℔ cans, 10 in case | 6 ¢ | 6½¢ | 5 ¢ |
| 10-lb cans, less than 10 | 10 ¢ | 10 ¢ | 7½¢ |
| Kegs, ℔ lb | 4½¢ | 5 ¢ | 2½¢ |
| ½ kegs, ℔ lb | 4½¢ | 5½¢ | 2½¢ |
| ¼ kegs, ℔ lb | 5 ¢ | 5½¢ | 3 ¢ |

**Enameled and Tinned Ware**—See *Ware, Hollow.*

**Escutcheon Pins—**
See *Pins, Escutcheon.*

**Escutcheons—**
Brass Thread....60@60&10%
Door Lock....Same dis. as Door Locks.
Wood....25%

**Expanded Metal—**
List No. 5.
Door Mats, Galvanized....25%
Fencing, Painted Sheets....20%
Lathing....10%
Netting, Painted Sheets....20%
Tree Guards, Paneled....15%
Window Guards, Paneled....15%

**Extractors, Lemon Juice**
—See *Squeezers, Lemon.*

**Fasteners, Blind—**
Austin & Eddy No. 2008....℔ gr., $9.00
Mackrell's, ℔ doz., $1.00....20@20&10%
Security Gravity....℔ gr., $9.00
Van Sand's Old Pat., $15 ℔ gr....55&10%
Van Sand's Screw Pat, $15 ℔ gr..60&10%
Zimmerman's....50&10%

**Faucets—**
B. & L. B. Co.
West's Lock, Open and Shut Key...50%
Burnside's Red Cedar....50%
Burnside's Red Cedar, bbl. lots....60&10%
Boss Metallic Key....50%
Cork Lined....70&5@70&10%
Diamond Lock....40%
Fenn's....40%
Fenn's Cork Stops....33⅓%
Frary's Pat. Petroleum....60%
IXL, 1st quality, Cork Lined....50%
Metallic Key, Leather Lined....60&10@ 60&10&10%
No Brand, Red Cedar (in bbls.)....50&10%
No Brand Metal Key....60%
O. K. Western Pattern Cork Lined....50%
Perfection, Fla. Red Cedar (in boxes)..40%
Reliable Cork Lined....60%
Self Measuring
Enterprise, ℔ doz., $36.00....20%
Lane's ℔ doz., $36.00....25&10%
John Sommers'
Peerless Best Block Tin Key....40%
Star....60%
Star, Metal Plug, new list....40%
Lockport, Metal Plug, reduced list....60%
Western Pattern Metal Key....40%

**Felloe Plates—**
See *Plates, Felloe.*

**Fibre Ware**—See *Ware, Fibre.*

**Fifth Wheels—**
Derby and Cincinnati....45&5%
Brewster....50&5%

**Files—**
**Domestic—**
American....66⅔&10@66⅔&10&5%
Arcade....60&10&5@60&10&10%
Eagle....60&10&10@70%
G. & H. Barnett (Black Diamond) 60&10@60&10&5%
Nicholson Files, Rasps, &c.60&10&5@ 60&10&10%
Nicholson (X.F.) Files....25%
Nicholson's Royal Files (Seconds)....75% (extra prices on certain sizes.)
Other makers, best brands..60&10&5@70%
Fair brands....70&10@70&10&10%
Second quality....80@80&5%
Arcade Horse Rasps...60&10@60&10&5%
Chelsea Horse Rasps, Hand Cut...50&10%
Heller's Horse Rasps....50&10@60%
McCaffrey's Horse Rasps....50&10%
Trojan Horse Rasps....60&10&5%
**Imported—**
Butcher....Butcher's list, 20%
Stubs....Stubb's' list 75@80%

**Fixtures Grindstone—**
Moore's....55%
P., S. & W. Co....50&10%
Reading Hardware Co....30&10%
Sargent's Patent....70&10%

**Fluting Machines—**
See *Machines, Fluting.*

**Fluting Scissors—**
See *Scissors, Fluting.*

**Fodder Squeezers—**
See *Squeezers, Fodder.*

**Forks—**
Hay, Manure, &c. Asso. List, 70@70&5&2%
Hay, Manure, &c., Phila. List, 60@60&10&2%
Plated, see Spoons.

**Frames—**
**Saw—**
Red, Polished and Varnished....℔ doz., $1.50, 25%
White Vermont....℔ gro.. $9.00@$10.00

**Screen, Window and Door—**
Bonanza Window Screens..50&5@50&10%
Cortland....40@40&5%
Empire Fancy Screen Doors, ℔ doz ..$13
Phillips' Window Screen Frames....50@50&5%
Porter's Pat. Window and Door Frame, 33⅓&10%
Stearns' Frames and Corners.25@25&10%
Warner's Screen Corner Irons..33⅓&10%

**Freezers, Ice Cream—**
American....60%
Arctic....70@70&5%
Blizzard....70%
Boss and Pet....60&10&10&10%
Buffalo Champion....65@65&5%
Confectioners' Machine....50%
Crown....60%
Double Action Crown....60%
Gem....65%
Giant....60%
Good Luck....65@65&5%
Granite State....65@65&5%
Keystone, P., D. & Co., each, $1.50....20%
Model....60@60&5%
Peerless....60&10%
Shepard's Lightning....65@65&5%
Standard....60@60&5%
Standard Double Action....60@60&5%
Star....60%
White Mountain....60@60&5%
Zero....70%

**Fruit and Jelly Presses—**
See *Presses, Fruit and Jelly.*

**Fruit Pickers—**
See *Pickers, Fruit.*

**Fry Pans**—See *Pans, Fry.*

**Funnels—**
Gersdorff's Perfection, Standard and Globe; *Tin*, 1 gro., 10%; 2 to 5 gro., 20%; 5 to 10 gro....30%
*Copper*, 1 to 6 doz., 15%; 6 to 12 doz., 20%; over 12 doz....25%

**Furnaces, Soldering—**
Burgess No. 3 Gem, Copper reservoir.$8.50
Burgess No. 3 Gem tin reservoir....$7.00
Clayton & Lambert No. 1 Fire-Pot, complete....$6.00

**Fuse**—Dis. 10@2% cash. ℔ M1000 ft.
Common Cotton Fuse, for dry gr'nd..$3.00
Common Hemp Fuse, for dry ground. 2.80
Double Taped Fuse, for very wet gr.. 5.60
Single Taped Fuse, for wet ground.. 4.75
Triple Taped Fuse, for very wet gr.. 6.40
Large Gutta Percha Fuse, for water.15.00
Small Gutta Percha Fuse, for water.10.00

**Gates Molasses—**
Boss, ℔ doz.:
No. 1, $7; No. 2, $8; No. 3, $9; No. 4, $10....60&10&10%
Lincoln's Pattern....70@70&10%
Stebbin's Genuine....60&10&10%
Stebbin's Pattern....80&10@80&10&5%
Stebbin's Tinned Ends....40&10%
Weed's....20&10%

**Gauges—**
Barrett's Comb. Roller Gauge....℔ doz $8.00@$8.50
Hoague & Peck's Champion Gauge—
With Scale....℔ doz.. $5.00
Without Scale....℔ doz.. $4.00
Marking, Mortise, &c....60&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge....20&10%
Starrett's Surface, Center and Scratch, 25&10%
Wire, Brown & Sharpe's....10@20%
Wire, Morse's....25%
Wire, P., S. & W Co....10&10%
Wire, Wheeler, Madden & Co....10%

**Gimlets—**
Nail and Spike....50&10&5%
Diamond Gimlets....℔ gr $5.00
Eureka Gimlets....60&10%
Double Cut, Douglass'....40&10%
Double Cut, Ives'....60@60&5%
Double Cut, Shepardson's....45@45&5%

**Glue—**
Dodd's Liquid Glue....25@25&5%
Improved Process....25@25&5%
Le Page's Liquid....25@25&5%
Upton's Liquid....35%

**Glue Pots**—See *Pots, Glue.*

**Grease, Axle—**
Axleine, tin boxes....℔ gross $12.00
Dixon's Everlasting...10-lb pails, ea. 85¢
Dixon's Everlasting, in bxs., ℔ doz 1 lb $1.20; 2 lb $2.00
English Coach, 5-lb tin pails. ℔ doz, $3.50
English Coach, wooden boxes....℔ gross $8.50
Fraser's....Keg ℔ lb 4¢, Pail ℔ lb 5¢
Fraser's, in boxes....℔ gr $9.50
Lower grades, special brands....℔ gr $5.50@$7.00
Tiger, 5-lb tin pails....℔ doz $2.85
Tiger, wooden boxes....℔ gross $7.00

**Grindstones—**
Family, regular list....60%
Family, Cleveland Stone Co....20%

**Grindstone Fixtures—**
See *Fixtures, Grindstone.*

**Gun Powder**—See *Powder.*

**Hack Saws**—See *Saws.*

**Hafts, Awl—**
Sewing, Brass Fer. ℔ gr....$1.75
Pat. Sewing, Long....℔ doz $1.20
Pat. Sewing, Short, ℔ doz....45@50%
Pat. Peg Leather Top, ℔ doz 45&5%
Pat. Peg, Plain Top, ℔ doz ....40@45%

## Halters—

Covert's Rope, Jute.....60&10&10&2%
Covert's Rope, 7-16-in., Jute.....70&2%
Covert's Rope, ½-in., Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie, 50&10&2%
Covert's Jute Horse Ties.....70&2%
Covert's Jute Cattle Ties.....70&10&2%
Covert's Adj. Web Halters.....35&5&2%
Covert's Saddlery Works Halters...33⅓%
Covert's Saddlery Works Horse and Cattle Ties.....33⅓%
Covert's Saddlery Works Handy Web Halters.....33⅓%

## Hammers—

### Handled Hammers—

Maydole's, list Dec. 1, '85.....25&10@35%
Buffalo Hammer Co.....
Humason & Beckley.....
Atha Tool Co.....
Verree.....
....50&10%
C. Hammond & Son.....40&10@—%
Fayette R. Plumb.
Artisans' Choice, A. E. Nail.....40&10%
Regular Y. & P., A. E. Nail.....50%
Horseshoe Turning Hammers.....50%
Other Hammers.....50&10%
Cheney's Claw.....40&10%
Cheney's Machinist's & Riveting..50&5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles, new list.....25&10
Peck, Stow & Wilcox.....35@40%
Sargent's.....40@40&10%

### Heavy Hammers and Sledges—

3 ℔ and under...₩ ℔40¢
3 to 5 ℔.....₩ ℔36¢ } 75&10@75&10
Over 5 ℔.....₩ ℔30¢ } &5%
Wilkinson's Smiths.....10½¢@11¢₩ ℔

## Handcuffs and Leg Irons

—See *Police Goods.*

## Handles—

### Cross-Cut Saw Handles—

Atkins', new list.....40%
Champion.....15%
Ely's Perfection.....₩ doz., $3.00
Sensible.....40%

### Iron, Wrought or Cast—

Door or Thumb.

| Nos. | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| Per doz. | $0.90 | 1.00 | 1.08 | 1.35 | 1.50 |

60&10&10%
Roggin's Latches.....₩ doz 30¢@35¢
Bronze Iron Drop Latches..₩ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no plate, $0.88.....net
Barn Door, ₩ doz $1.40.....10&10%
Chest and Lifting.....70@70&10%

### Wood—

Saw and Plane.....40&10@50%
Hammer, Hatchet, Axe, &c.....40@40&5%
Brad Awl.....₩ gr $2.00
Hickory Firmer Chisel, ass'd. ₩ gr 4.50
Hickory Firmer Chisel, large. ₩ gr 5.00
Apple Firmer Chisel, ass'd...₩ gr 5.00
Apple Firmer Chisel, large...₩ gr 6.00
Socket Firmer Chisel, ass'd..₩ gr 3.00
Socket Framing Chisel, ass'd. ₩ gr 5.00
J. B. Smith & Co.'s Pat File.....50%
File, assorted.....₩ gr 2.75
Auger, assorted.....₩ gr 5.00
Auger, large.....₩ gr 7.00
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass.....₩ set $1.25
Pat. Auger, Swan's.....₩ set $1.00
Hoe, Rake, Shovel, &c.....60@60&5%

## Hangers—

Barn Door, old patterns.....70@70&5%
Barn Door, New England.....70@70&5%
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Steel Track.....55%
Champion.....60&10%
Climax Anti-Friction.....55%
Zenith for Wood Track.....55%
Sterling.....50&10@60%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00.....50&2%
Kidder's.....50@50&10%
Boss.....60&10@60&10&5%
Best Anti-Friction.....60&10@60&10&5%
Duplex (Wood Track).....60&10&5%
Terry's Modern.....50&10@50&10&5%
Terry's Ideal.....50&10@50&10&5%
Terry's Solid.....50&10@60%
Terry's Shield.....50&10@60%
Terry's Wrought Single Strap.....50&10%
Cronk's Patent, Steel Covered.....50&10%
Carrier Steel Anti-Friction.....50&10%
Richards'.....30@30&10%
Lane's New Standard.....50@50&5%
Lane's Standard.....50&5@50&10%
Lane's Parlor.....40%
Warner's Pat.....20&10&10%
Stearns' Anti-Friction.....20&10&10%
Stearns' Challenge.....25&10&10%
Cincinnati Nos. 1, $2.25; 3, $2.50; 4, $2.50.
Paragon Nos. 5, 5¼, 7 and 8.....20&10%
Crescent.....60@60&10%
Nickel, Steel, Nos. 0, $25; 1, $20; 2, $15. 40&10@50%
Chicago Anti-Friction.....30&10%
Star.....40&10@40&10&5%
Barry.....50%
Interstate.....50&10@60%
Pendulum, Payson's.....40@40&10%
Moody.....45%
Economy, $6.00.....50&10%
Perfection.....50&10@50&10&5%
Lundy, Steel Parlor.....40%
Matchless.....50&10%
Magic.....45&10%
Wild West.....45&10%
Moore's Elevator.....33⅓%
Moore's Baggage Car Door.....33⅓%
Moore's Railroad.....55%

## Harness Snaps—See *Snaps.*

## Hatchets—

American Axe and Tool Co.
Blood's.....
Hunt's.....
Hurd's.....
Mann's.....
Peck's.....
Underhill's.....
Fayette R. Plumb.....
C. Hammond & Son.....
40 & 10 @ 40 & 10 &5%
Kelly's.....
Buffalo Hammer Co.....
Sargent's & Co.....
P. S. & W. Co.....
50 @ 50 &10%
Schulte, Lohoff & Co.....
Ten Eyck Edge Tool Co.....
Collins.....10%

## Hay and Straw Knives

See *Knives.*

## Hinges—

### Blind Hinges—

Parker.....75&10%
Huffer.....50@50&10%
Clark's:
Nos. 1, 3, 5, "1868, Old Pattern.....75&10&5%
Nos. 1 and 3, "Tip" Pattern.75&10&5%
No. 1, "Diamond," for wood only.80&5%
No. 1, "Cottage," for wood only.80&10%
No. 50, "Buffalo Noiseless," 40, 60 and 65.....75%
No. 25, "Empire" Reversible...75&10%
Mortise Gravity, Nos. 2, 4, 4½, 6, 8, 9 and 10.....50%
Lull & Porter Nos. 3, 2½, 2, 1, 0, 00, 4 and 5.....75&10&2½%
"Dixie L. & S.," Nos. 3, 2½, 2, 1, 000, 4 and 5.....75&5%
"Buffalo Reversible," Nos. 3, 2, 1½, 1 and 0.....70& 5%
Sargent's Nos. 3, 5 11, 12, 13.....75&10@75&10&5%
Reading's Gravity.....75&10@75&10&5%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%

### Gate Hinges—

Western.....₩ doz $4.20, 60@60&10%
N. E.....₩ doz $7.80, 60@60&10%
N. E. Reversible ₩ doz..$5.60, 60@60&10%
Clark's, Nos. 1 2, 3.... 60&10@60&10&5%
N. Y. State.....₩ doz $4.90,60@60&10%
Automatic.....₩ doz $12.50, 50%
Shepard's.....60&10&5%

### Spring Hinges—

Geer's Spring and Blank Butts....40%
Union Spring Hinge Co.'s list, March, 1886.....20%
Barker's Double Acting.....25%
Union Mfg. Co.....25%
Bommer's Japanned.....35%
Bommer's All other Kinds.....30%
Buckman's.....15@20%
Chicago.....30%
Bardsley's Patent Checking.....15%
Acme.....30%
U. S.....25&10%
Empire and Crown.....20%
Hero and Monarch.....55%
American, Gem and Star.....20%
Oxford.....20%
Royal.....66⅔%
Reliable.....60%
Champion.....60%
No. 10 Matchless.....60%
No. 25 Unbreakable.....60%
J. G. C. Covered, ₩ gro., $30.....50&5%
Samson.....60@60&7½%
Wiles', No. 1, ₩ gro., $16; No. 2.....$13
Devore, No. L.....₩ gro., $13.00
Rex.....₩ gro., $13.00
Freeport.....₩ gro., $12.00
New Idea Nos. 1 and 10...₩ gross $13.00
New Idea Dbl. Acting.....45%
Ideal No. 3.....₩ gross $10.00
Stearns' Noiseless Floor Hinge, ₩ set, $5.00.....20&10@30%

Extra 5@10% often given.

### Wrought Iron Hinges—

List February 14, 1891.
Strap and T.....50&10@50&10&10%
Corrugated Strap and T.....50&10&5%
Screw Hook and Strap.....6 to 12 in., ₩ ℔.. 4¢; 14 to 20 in., ₩ ℔..3½¢; 22 to 36 in., ₩ ℔.. 3¢
Screw Hook and Eye.....⅜ in., ₩ ℔ 7¾¢; ½ in., ₩ ℔ 5½¢; ⅝ in., ₩ ℔ 4½¢
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 232 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10¢
Plate Hinges "Providence" 8, 10 & 12 in., ₩ ℔.....5¢; over 12 in. ₩ ℔.....4¢

## Hoes—

### Eye—

D. & H. Scovil.....20%
Lane's Crescent, Planters' Pattern.45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat } 60&5
Am. Axe and Tool Co., S. & O. Pat } @60&10%
Chattanooga Tool Co., S. & O. Pat..60& 5@60&10%
Grub.....60&10%

### Handled—

Garden, Mortar, &c.....70@70&5&2%
Planter's, Cotton, &c.....70@70&5&2%
Warren Hoe.....60@60&5%
Magic.....₩ doz $4.00

## Hog Rings and Ringers—

See *Rings and Ringers—*

## Hoisting Apparatus—

See *Machines, Hoisting.*

## Hollow-Ware—

See *Ware, Hollow.*

## Holders—

### Bag—

Sprengle's Pat.....₩ doz $18....60%

### Bit—

Extension.
Barber's, ₩ doz $15.00.....40@40&10%
Ives, ₩ doz $20.00.....60&5@60&10%
Diagonal.....₩ doz $24.00, 40%
Angular.....₩ doz $24.00, 40&5%

### File and Tool—

Bals Pat.....₩ doz $4.00, 25%
Nicholson File Holders.....20%

### Sash—

Motley's Adj. Sash, Medium Size..... ₩ doz $1.20, 40%

## Hooks—

### Cast Iron—

Bird Cage, Sargent's List ...
Bird Cage, Reading .....
Clothes Line, Sargent's list..
Clothes Line, Moore's.....
....60&10&10%
....70%
Clothes Line, Reading list 60&10@60&10&10%
Ceiling, Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading. 50&10@50&10&10%
Coat and Hat, Moore's.....70%

### Wrought Iron—

Cotton.....₩ doz $1.25
Cotton Pat. (N. Y. Mallet and Handle W'ks.....30%
Tassel and Picture, T. & S. Mfg. Co....50%
Wrought Staples Hooks, &c. See Wrought Goods

### Wire—

Wire Coat and Hat, Gem, list April, 1886.....60@60&10
Wire Coat and Hat, Miles, list April, 1886.....50@50&10%
Indestructible Coat and Hat...45@45&5%
Wire Coat and Hat, Standard.60@60&10%
Handy Hat and Coat.....50&10@60%
Steady Ceiling Hooks.....50&10@60%
Belt.....80&15@80&20%
Atlas, Coat and Hat.....65%
Williamson's Bird Cage Hooks, List April, 1892.....40%
Bright Wire Goods—See Wire.

### Miscellaneous—

Grass, No. 2, $2.00; No. 3, $2.10; No. 4, $2.25
Nolin's Grass.....₩ doz $2.25
Bush.....55@60%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable Iron. 70@70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks—See Bench Stops.

## Horse Nails—See *Nails, Horse*

## Horse Shoes—

See *Shoes, Horse.*

## Hose, Rubber—

Competition, Fair quality.....75@75&10%
Competition, Low Grade.....80@80&10
Standard.....70&10&70@10&5%
Extra.....60&10@60&10&10%
N. Y. B. & P. Co., Para.....25&5%
N. Y. B. & P. Co., Extra.....40&5@50%
N. Y. B. & P. Co., Dundee.....60@60&5%
Cotton Garden, ¾ in., coupled:
Fair Quality, ₩ ℔.....7¢
Good Quality, ₩ ℔.....8½¢

## Huskers—

Blair's Adjustable.....₩ gr $8.00
Blair's Adjustable Clipper.....₩ gr 7.00
Hubbard's Solid Steel.....₩ gr 4.50

## Indurated Fiber Ware—

See *Ware, Indurated Fiber.*

## Irons.

### Sad—

From 4 to 10, at factory....₩ 100 ℔, $2.30@$2.40
Self-Heating.....₩ doz $8.00
Self-Heating Tailors'.....₩ doz $18.00
Mrs. Potts' Sad Irons, per set:

| No. | 50 | 55 | 60 | 65 |
|---|---|---|---|---|
| Small lots | .90 | .85 | 1.05 | .95 |

Crown Improved.....60&10%
Ideal Irons, new list...50&10@50&10&10%
Salamander Irons.....25%
B. B. Sad Irons, ₩ ℔.....3@3½¢
Chinese Laundry (N.E.Butt Co.).8½¢, 15%
New England.....5¢, 20@20&5%
Mahony's Troy Pol. Irons.....25%
Sensible, list Jan. 91.....50&10&5%
Sensible Tailor's Irons.....33⅓%
National Self-Heating.....30%

### Soldering—

Soldering Coppers.....₩ ℔ 19@21¢
Covert's Adjustable, list Jan. 1, 1888. 35&2%
Tinker's Dread..₩ doz $1.75; ₩ gro. $18

### Pinking—

Pinking Irons, ₩ doz., 55@60¢.

## Jack Screws—See *Screws.*

## Jacks, Wagon—

Daisy.....33⅓%
Victor.....33⅓%
Lockport.....40%

## Kettles—

Brass, Spun, Plain, list Jan. 1, '91..25&5%
Brass, Spun, Pld.W.M.list Jan. 1, '91..20%
Stamped Brass Kettles.....₩ ℔ 21¢
Enameled and Tea—See *Ware, Hollow.*

## Keys—

Lock, Ass'n list Dec. 30, 1886..65&10@70%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss' Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Wollensak Tinned.....50&10%

## Knife Sharpeners—

See *Sharpeners, Knife.*

## Knives—

### Butcher, Shoe, &c.

Wilson's Butcher Knives, List Dec 8, 1890.....25%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c.....40%
Jordan's AA A1 Butchers', list.....net
Nichols' Butcher Knives.....40&10%
W. W. Wilson, Butcher, 6 in., $2.00; 7 in., $2.70; 8 in., $3.80, &c.
Ames' Shoe Knives.....25@30%
Ames' Bread Knives, ₩ doz $1.50, 15@20%
Moran's Shoe and Bread.....20@20&10%
Hay and Straw—See Hay Knives.
Table and Pocket—See Cutlery.

### Corn—

Bradley's.....10%
Wadsworth's.....25@25&10%

### Drawing—

Witherby.....
P. S. & W.....
Mix.....
New Haven.....
Merrill.....
Douglass.....
Weimer.....
....75@75&10&5%
....60&10@60&10&5%
....75&75@5%
....15&10@25%
L & I. J. White.....20&5%
Bradley's.....35%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

## Hay and Straw—

Lightning, from jobbers....$6.50@$7.50
Wadsworth's.....40&7½@40&10%
Carter's Needle...₩ doz. $11.00@$11.50
Heath's.....₩ doz. $13.00@$13.50
Nolin's Hay.....₩ doz. $7.00@$8.00

## Mincing—

Am. (2d quality), ₩ gr., 1 blade, $7
2 blades, $12; 3 blades, $18.....net
Lothrop's.....20&10%
Smith's, ₩ doz., Single, $2; Double $3 45@50%
Knapp & Cowles.....50&10@60%
Buffalo Adjustable....₩ doz. $3.00, 33⅓%

## Knobs—

Door, Mineral.....60@65%
Door, Por. Jap'd.....70@75%
Door, Por. Nickel.....$2.00@$2.25
Door, Por. Plated Nicke..l....$2.00@$2.25
Drawer, Porcelain....60&10@60&10&10%
Hemacite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1885..40%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65&10%
Carriage, Jap.....₩ gro 80¢, 60&10%
Bardsley's Wood Door, Shutter, &c....15%

## Ladders.

Davies Extension and Single..... 20&5%

## Ladies—

Melting, Sargents'.....60@60&5%
Melting, Reading.....35&10%
Melting, P., S. & W.....35&10@40%
Melting, Warner's.....30%

## Lanterns—

### Tubular—

Regular, with Guard.....₩ doz $3.50
O. K., with Guard.....₩ doz $3.75
Side Lift, with Guard.....₩ doz $4.00
Square Lift, with Guard.....₩ doz $4.25
Anti-Friction, with Guard...₩ doz $4.50
Brass Plated, Sq. Lift, Guard.₩ doz $5.50
Cop. Plated, Sq. Lift, Guard..₩ doz $5.50

### Bull's Eye Police—

2¾-inch regular.....₩ doz $3.6 0
3-inch regular.....₩ doz $3.90
2¾-inch flash light.....₩ doz $4.00
3-inch flash light.....₩ doz $4.50

## Lawn Mowers—

See *Mowers, Lawn.*

## Leaders, Cattle—

Humason, Beckley & Co.'s.....70%
Sargent's.....70&10@70&10&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....60&10%

## Lemon Squeezers—

See *Squeezers, Lemon.*

## Lifters, Transom—

Wollensak's:
Class 3 and 4, Bronzed Iron.....60%
Class 3 and 4, Bronze Metal.....50%
Class 3 and 4, Brass.....50%
Skylight Lifters.....25%
Reiher's, list Feb. 20, 1891
Bronzed Iron Rods.....60@60&10%
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's:
Universal.....60%
Solid Grip.....60&10@60&10&10%
Imperial.....50&10%

## Lines—

Cotton and Linen Fish.....50%
Chalk.....60%
Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk.....55%
Samson Cotton, No. 4, $2; No. 4½, $2.50 10%
Silver Lake, Braided No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₩ gro.....25%
Mason's Linen, No. 3½, $1.50; No 4, $2.00; No 4½, $2.50.
Mason's Colored Cotton.....45%
Wire Clothes..Nos. 18 19 20
100 ft.....$3.50 $3.00 $2.50
Ventilator Cord, Samson Braided, White or Drab Cotton..₩ doz $7.50..20%
Ossawan Mills:
Twisted Chalk.....60%
Braided Chalk.....50%
Solid Braided Ventilator and Masons' Lines.....25%
Cotton Clothes Lines.....₩ ₩ 16¢

## Links, Open—

Terry's—per gro.:

| Nos. | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| | $6.00 | 8.00 | 12.00 | 16.00 |

## Locks, &c.—

### Cabinet—

Eagle, Gaylord Parker and Corbin... } List, March '84, rev. Jan. 1, '85.33⅓&2%
Deitz, Nos. 36 to 39.....40%
Deitz, Nos. 51 to 63.....40&10%
Deitz, Nos. 87 to 96.....30%
Champion Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....25&10%
Champion Cab. and Combin.....33⅓%
Yale.....net prices
Romer's.....25%

### Door, Locks, Latches, &c.

R. & E. Mfg. Co., list Mar. 20, 1889..... } 60&10@70% Much lower net prices often made
Mallory, Wheeler & Co. list July, '88..... }
Sargent & Co., List Aug. 1, '88 }

Britain, Graham & Mathes, list Jan. 1890 ..... 60&10&10%
Plate ..... 33⅓&2%
Barnes Mfg. Co. ..... 40@40&10%
Yale ..... net prices
Deitz Flat Key ..... 30%
Romer's Night Latches ..... 15%
Brooklyn Latches ..... 50&10%
Warner's Burglar Proof, ₩ doz. $8.00, 50%

### Elevator—

Moore's ..... 33⅓%

### Padlocks—

List June 10, 1891 ..... 50&2%
Norwich Lock Mfg. Co., old list ..... 50&2%
Yale Lock Mfg. Co.'s ..... net prices
Eagle ..... 40%
Eureka, Eagle Lock Co. ..... 40&2%
Romer's Nos. 0 to 91 ..... 30%
Romer's Scandinavian, &c., Nos. 100 to 505 ..... 15%
A. E. Deitz ..... 40%
Champion Padlocks ..... 40%
Hotchkiss ..... 30%
Star ..... 60%
Horseshoe ..... ₩ doz $9. 50@50&10%
Barnes Mfg. Co. ..... 40@40&10%
Nock's ..... 30%
Scandinavian ..... 90&50%
E. T. Fraim's Keystone Scandinavian, 1010 line ..... 90&40%
120 line ..... 90&25%
109 line ..... 65%
510 line ..... 70&10%
225, 610 and 209 lines ..... 70%
All other numbers ..... 50&5%
Ames Sword Co. up to No. 150 ..... 40%
Ames Sword Co. above No. 150 ..... 50%
Slaymaker, Barry & Co.
No. 1010 line ..... 90&50%
No. 41 line ..... 60%
No. 61 line ..... 60%
No. 21 line ..... 80%

### Sash, &c.—

Clark's No. 1, $10; No. 2, $8 ₩ gr. ..... 33⅓&%
Ferguson's ..... 33⅓&%
Victor ..... 60&10&2%
Walker's ..... 10%
Attwell Mfg. Co. ..... 25&33⅓&%
Reading ..... 66⅔&10@66⅔&10&10%
Hammond's Window Springs ..... 40%
Common Sense, Jap'd, Cop'd and Br'zed ..... ₩ gr $4.00
Common Sense, Nickel Plated, ₩ gr $10.00
Universal ..... 30%
Kempshall's Gravity ..... 60%
Kempshall's Model ..... 60@60&10%
Corbin's Daisy, list Feb. 15, 1886 ..... 70%
Payson's Perfect ..... 60&10&10%
Hugunin's Sash Balances ..... 25&5&2%
Hugunin's New Sash Locks ..... 25&5&2%
Ives' Patent ..... 60&10&5@60&10&10%
Fish (Liesche's pat.), No. 100, ₩ gr., $8; No. 105, ₩ gr., $10 ..... 50%
Davis Bronze, Barnes Mfg. Co. ..... 60%
Champion Safety list January, 1893. 70&5%
Security ..... 70%
Giant, list Jan., 1892 ..... 70&5%
Wolcott's ..... 60&10&5%
Monarch ..... 50%

### Lumber Tools—

See *Tools, Lumber.*

### Lustro—

Four-ounce bottles ..... ₩ doz, $1.75; ₩ gross ..... $17.00

## Machines.

### Boring—

| | Without Augers. | Upright. | Angular. | |
|---|---|---|---|---|
| Douglas | $5.50 | $6.75 | | 50% |
| Snell's, Rice's Pat. | 5.50 | 6.75 | 40&10&10% | |
| Jennings' | 5.50 | 6.75 | 50@50&5% | |
| Other machines | 2.25 | 2.50 | | |

Phillip's Patent with Augur ..... 7.00 7.50 .....
Millers Falls ..... 7.50 ..... 25%
Boss, Carpenters' 3.60
Boss, Ship Bldrs'. 3.85

### Fluting—

Knox, 4½-inch Rolls ..... $3.25 each } 35%
Knox, 6-inch Rolls ..... $3.60 each }
Eagle, 3½-inch Rolls, $2.15 ..... 35%
Eagle, 5½-inch Rolls, $2.85 ..... 35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6 50 each ..... 35%
Crown Jewel, 6 in. ..... $3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each ..... 35%
Domestic Fluter ..... each, $1.50
Geneva Hand Fluter, White Metal, ₩ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; 2, $12.50; 3, $10.00; 4, $8.25 ..... 30%
Shepard Hand Fluter, No. 85, per doz $15.50 ..... 40%
Shepard Hand Fluter, No. 110, ₩ doz $11.00 ..... 40%
Shepard Hand Fluter No. 95, ₩ doz $3.00 ..... 40%
Combined Fluter and Sad Iron, ₩ doz $15.00 ..... 30%

### Hoisting—

Moore's Hand Hoist, with Lock Brake. 20%
Moore's Anti-Friction Differential Pulley Block ..... 20%
Moore's Rope Differential Pulley Block ..... 60%
Energy Mfg. Co.'s ..... 25%
See also *Blocks.*

### Washing—

Anthony Wayne, ₩ doz, No. 1, $42; No. 2, $36; No. 3, $42.
Wayne American ..... ₩ doz $36.00
Western Star ₩ doz, No. 2, $36; No. 3 $39
Weisell ..... ₩ doz $54.00
Fair and Square ..... ₩ doz $42.00

### Mallets—

Hickory ..... 20&10@20&10&10%
Lignumvitæ ..... 20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. 30@30&10%

### Mattocks—Regular list. 60&10@60&10&5%

### Measures—

Standard Fibreware, No. 1, peck ₩ dozen, $3.50; ½-peck, $3.00

### Meat Cutters—

See *Cutters, Meat.*

### Menders, Harness—

Per doz ..... $2.00

### Milk Cans—See *Cans, Milk.*

### Mills—

#### Coffee—

Box and Side, List, Jan. 1, 1888. 60@60&5%
Net prices are often made which are lower than above discount.
American, Enterprise Mfg. Co., list Jan. 17, 1893 ..... 20%
The Swift, Lane Bros. ..... 30%
Waddell's New Box Mills, Ideal Brand, New List ..... 60%

### Mincing Knives—

See *Knives, Mincing.*

### Molasses Gates—

See *Gates, Molasses.*

### Money Drawers—

See *Drawers, Money.*

### Mowers, Lawn—

Best Machines: 10-in., $4; 12-in., $4.50; 14-in., $5; 16-in., $5.50; 18-in., $6.
Low-Grade Machines: 10-in. $3; 12-in., $3.25 14-in., $3.50 each

### Muzzles—

Safety ..... ₩ doz, $3.00, 25%

## Nails.

Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, May 1, '92 ..... 85&5%
Tack Mfrs.' list ..... 70&5@70&10%
Hungarian, Finishing, Upholsterers', &c. See *Tacks.*

### Horse—

| Nos. | 6 | 7 | 8 | 9 | 10 | |
|---|---|---|---|---|---|---|
| Putnam | 23¢ | 21¢ | 20¢ | 19¢ | 18¢. | .15% |
| American | 9½ | 9½ | 9½ | 9½ | 9½ | net |
| Ausable | 28¢ | 26¢ | 25¢ | 24¢ | 23¢ | 40&5&2% |
| Clinton, Fin. | 19¢ | 17¢ | 16¢ | 15¢ | 14¢ | .30&5% |
| Essex | 28¢ | 2¢ | 25¢ | 24¢ | 23¢ | 40&10@50% |
| Lyra | 9½ | 9½ | 9½ | 9½ | 9½ | net |
| Snowden | 9½ | 9½ | 9½ | 9½ | 9½ | net |
| Standard | 23 | 21¢ | 20¢ | 19¢ | 18¢ | 35% |
| Vulcan | 23¢ | 21¢ | 20¢ | 19¢ | 18¢. | .25% |
| Northwest'n. | 25¢ | 23¢ | 22¢ | 21¢ | 20¢ | 25@25&5% |
| C. B. K. | 25¢ | 23¢ | 22¢ | 21¢ | 21¢ | 40% |
| A. C. | 25¢ | 23¢ | 22¢ | 21¢ | 21¢ | 40&10% |
| Maud S. | 25¢ | 23¢ | 22¢ | 21¢ | 21¢ | 50&10&5% |
| Champlain | 28¢ | 26¢ | 25¢ | 24¢ | 23¢ | 40&5&2% |
| Champion | 25¢ | 23¢ | 22¢ | 51¢ | 20¢ | 10&10&10% |
| Capewell. | 19¢ | 18¢ | 17¢ | 16¢ | 16¢. | .10&5% |
| Anchor | 23¢ | 21¢ | 20¢ | 19¢ | 18¢ | 35% |
| Western | 23¢ | 21¢ | 20¢ | 19¢ | 18¢ | 50% |
| Empire Bronzed | | | | | | 13@14 ₩ ℔ |

### Picture—

Brass Head, Sargent's list ..... 60@60&10%
Brass Head, Combination list ..... 50&10%
Porcelain Head, Sargent's list. 50&10&10%
Porcelain Head, Combination list. 40&10%
Niles' Patent ..... 40%

### Nail Pullers—See *Pullers, Nail.*

### Nail Sets—See *Sets, Nail.*

### Nut Crackers—

See *Crackers, Nut.*

### Nuts—List Dec. 18, 1889.

| | Square. | Hex. |
|---|---|---|
| Hot Pressed | 5.80¢ | 6.50¢ off list |
| Cold Punched | 5.00¢ | 5.10¢ off list |

In packages of 100 ℔, add 1-10¢ ₩ ℔, net; in packages less than 100 ℔, add ½¢ ₩ ℔, net.

## Oakum—

Best or Government ..... ₩ ℔ 6¾@7¼¢
U. S. Navy ..... ₩ ℔ 5¾@6¢
Navy ..... ₩ ℔ 5¢@5¼¢

### Oil Tanks—See *Tanks, Oil.*

### Oilers—

Zinc and Tin ..... 65&10@70&5%
Brass and Copper ..... 50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₩ doz. 10@10&5%
Malleable, Hammers' Old Pattern, same list ..... 45%
Prior's Pat. or "Paragon" Zinc. 60&10&10%
Prior's Pat. or "Paragon" Brass ..... 50%
Olmstead's Tin and Zinc ..... 60%
Olmstead's Brass and Copper ..... 50%
Broughton's Zinc ..... 60%
Broughton's Brass ..... 50%
Steel, Draper & Williams ..... 50%
Wilmot & Hobbs Mfg. Co., Steel Anti-Rust ..... 60%

### Openers, Can—

Messenger's Comet ..... ₩ doz $3.00, 25%
American ..... ₩ gross $2.75@$3.00
Duplex ..... ₩ doz 25¢, 15@20%
Lyman's ..... ₩ doz $3.75, 20%
No. 4, French ..... ₩ doz $2.25, 55@60%
No. 5, Iron Handle ..... ₩ gr $6.00, 45@50%
Eureka ..... ₩ doz $2.50, 10%
Sardine Scissors ..... ₩ doz $2.75@3.00
Star ..... ₩ doz $2.75
Sprague, No. 1, $2.00; 2, $2.25; 3, $2.50; 66⅔&70%
Excelsior, No. 1 $2.50; No. 2, $1.50 ..... 40%
World's Best ₩ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00 ..... 50&10%
Universal, ₩ doz $3.00 ..... 55&5%
Domestic, ₩ doz $2.00 ..... 45%
Champion, ₩ doz $2.00 ..... 50%
Moore's ..... 70%

## Packing, Steam—

### Rubber—

Standard, fair quality ..... 70@70&10%
Inferior quality ..... 75@80%
Extra ..... 60@60&5%
N. Y. B. & P. Co., Standard ..... 50%
N. Y. B. & P. Co., Empire ..... 60%
N. Y. B. & P. Co., Salamander ..... 25%
Jenkins' Standard, ₩ ℔ 80¢ ..... 25@25&5%

### Miscellaneous—

American Packing ..... 10@11¢ ₩ ℔
Russia Packing ..... 14¢ ₩ ℔
Italian Packing ..... 13@14¢ ₩ ℔
Cotton Packing ..... 15@17¢ ₩ ℔
Jute ..... 7@8¢ ₩ ℔

### Pails—

#### Creamery—

S. S. & Co.: 18-qt., $7.00; 20-qt., $7.25 ₩ doz. ..... 5%

#### Galvanized—

| | Quarts | 10 | 12 | 14 | |
|---|---|---|---|---|---|
| Hill's Light Weight, ₩ doz. | $2.75 | 3.00 | 3.25 | | |
| Hill's Heavy Weight, ₩ dz. | 3.00 | 3.25 | 3.75 | | |
| Sidney Shepard & Co. | 2.50 | 2.75 | 3.00 | | |
| Central Stamping Co. | 2.50 | 2.75 | 3.00 | | |
| Iron Clad | 2.50 | 2.75 | 3.00 | | |
| Fire Buckets | 2.75 | 3.25 | 3.50 | | |

Buckets—See Well Buckets.

#### Indurated Fiber Ware

Star Pails, 12 qt. ..... ₩ doz $4.20 } 25%
Milk, 14 qt. ..... ₩ doz $5.40 }
Stable, 14 qt. ..... ₩ doz $6.00 }
Fire Pails, deep ..... ₩ doz $4.80 }
Fire Pails, round bottom ₩ doz $5.40 }

#### Standard Fiber Ware—

| | Plain. | Deer'd |
|---|---|---|
| Water Pails, 12 qt., ₩ doz. | $3.15 | $3.75 |
| Dairy Pails, 14 qt., ₩ doz. | 3.75 | 4.25 |
| Fire Pails, No. 1, 12 qt., ₩ doz | 3.75 | |
| Fire Pails, No. 2, 14 qt., ₩ doz | 4.25 | |
| Sugar Pails | 5.00 | 5.50 |
| Horse Pails | 4.00 | |
| Buggy Pails | 3.00 | |
| Slop Jars (bal. trap) | 7.50 | 8.50 |
| Chamber Pails, 14 qt. | 6.00 | 7.00 |

### Pans—

#### Dripping—

Small sizes ..... ₩ ℔ 5½¢
Large sizes ..... ₩ ℔ 5¢
Silver & Co. (Covered) ..... 40%

#### Fry—

Standard List:

| No. | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| ₩ doz. | $3.00 | $3.75 | $4.25 | 4.75 | $5.25 |
| No. | 5 | 6 | 7 | 8 | |
| ₩ doz. | $6.00 | $7.00 | $8.00 | $9.00 | |

Polished, regular goods ..... 75@75&10%
Acme Fry Pans ..... 66⅔&%

### Dust—

Steel Edge, No. 1 ..... ₩ doz $1.75

### Roasting and Baking—

Columbian, S. S. & Co.: Nos. 10, $2; 20, $2.25; 30, $2.50 each ..... 60&10%

### Paper and Cloth—

### Sand and Emery—

List April 19, 1886 ..... 50&10@50&10&10%
Sibley's Emery and Crocus Cloth ..... 30%

### Parers—

#### Apple—

Advance ..... ₩ doz $4.75
Baldwin ..... ₩ doz 5.25
Bonanza ..... each 5.00
Daisy ..... ₩ doz 4.00
Dandy ..... each 7.50
Eclipse ..... ₩ doz 4.00
Eureka, 1888 ..... each 16.00
Family Bay State ..... ₩ doz 12.00
Favorite ..... ₩ doz 5.00
Gold Medal ..... ₩ doz 4.00
Ideal ..... ₩ doz 4.00
Improved Bay State ..... ₩ doz 27.00@30.00
Little Star ..... ₩ doz 4.50
Monarch ..... ₩ doz 13.50
New Lightning ..... ₩ doz 5.50
Oriole ..... ₩ doz 4.00
Penn ..... ₩ doz 3.00
Perfection ..... ₩ doz 4.00
Pomona ..... ₩ doz 4.00
Rocking Table ..... ₩ doz 6.00
Turn Table ..... ₩ doz 4.50
Victor ..... ₩ doz 13.50
Waverly ..... ₩ doz 4.00
White Mountain ..... ₩ doz 4.00
Reading 72 ..... ₩ doz 4.25
Reading 78 ..... ₩ doz 7.00

#### Potato—

White Mountain ..... ₩ doz $4.50
Antrim Combination ..... ₩ doz $5.50
Hoosier ..... ₩ doz $3.50
Saratoga ..... ₩ doz $5.50

### Pencils, Soapstone—

See *Crayons.*

### Pickers, Fruit—

Prize Fruit Pickers ..... 50%

### Picks—

Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00 ..... 60&10&5@60&10&10&5%

### Picture Nails—

See *Nails, Picture.*

### Pinking Irons—

See *Irons, Pinking.*

### Pins—

#### Bow—

Humason, Beckley & Co.'s ..... 60&10%
Sargent & Co.'s, $17 and $18 ..... 60&10%
Peck, Stow & W. Co. ..... 50&10@50&10&5%

#### Escutcheon—

Iron, list Nov. 11, 1885. 50&10@50&10&5%
Brass ..... 60@60&5%

### Pipe, Wrought Iron—

List April 13, 1893.

| | |
|---|---|
| 1¼ and under, Plain | 57½&10% |
| 1¼ and under, Galv. | 50&10% |
| 1½ and over, Plain | 67½&10% |
| 1½ and over, Galv. | 57½&10% |
| Boiler Tubes, list Oct. 24, 1892 | 65&10% |
| Casing, list Nov. 16, 1892 | 52½&10% |
| Inserted Joints Casing, list Nov. 16, 1892 | 47½&5% |
| Steel Boiler Tubes | 27½&5% |
| Cold Drawn Seamless Steel Tubing | 50% |

### Planes and Plane Irons—

#### Wood Planes—

Molding ..... 40&10%
Bench, First quality ..... 45&10%
Bench, Second quality ..... 50&10%
Bailey's (Stanley R. & L. Co.) ..... 50&10%

#### Iron Planes

Bailey's (Stanley R. & L. Co.) ..... 50&10%
Miscellaneous Planes (Stanley R. & L. Co.) ..... 25&10%
Steers' Iron Planes ..... 50@50&5%
Meriden Mal. Iron Co.'s ..... 50@50&5%
Davis' Iron Planes ..... 50@50&5%
Birmingham Plane Co. ..... 60@60&5%
Gage Tool Co.'s Self-Setting ..... 20&10&10%
Chaplin's Iron Planes ..... 50@50&5%
Sargent's ..... 60@60&10%
Standard Tool Co. ..... 50@50&5%

#### Plane Irons—

Butcher's ..... $5.00@$5.25 to a
Buck Bros. ..... 30%

Auburn Thistle, Ohio, Sandusky } .30&10@30&10&10%
L. & I. J. White ..... 25%
Stanley R. & L. Co. ..... 50&10%

### Plates—

Felloe ..... ₩ ℔ 6¢@6½¢

### Pliers and Nippers—

Button's Patent ..... 60%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in., $21.00 ₩ doz. ..... 40%
Humason & Beckley Mfg. Co. 50@50&10%
Lindsay's Giant ..... 33⅓&%
Gas Pliers ..... 60%
Gas Pliers, Custar's Nickel Plated. 60&5%
Eureka Pliers and Nippers ..... 40%
Russell's Parallel ..... 25%
P., S. & W. Cast Steel ..... 50@50&5%
P., S. & W. Tinners' Cutting Nippers, add 6% ..... 10%
Carew's Pat. Wire Cutters ..... 20%
Morrill's Parallel, ₩ doz, $12.00 ..... 30&5%
Cronk's 3 in., $15.00; 10 in. ..... $20
Cronk's Button Pattern ..... 50&10@60%
Cronk's Carrier Pliers ..... 60@60&5%

### Plumbs and Levels—

Regular List ..... 75&10@75&10&10%
Stanley's Duplex ..... 20&10%
Stanley's Handy ..... 20&10%
Disston's ..... 50%
Cook's ..... 40&10%
Pocket Levels ..... 70&10@70&10&10%
Davis Iron Levels ..... 30%
Davis Inclinometers ..... 10&10%

### Poachers, Egg—

Buffalo Steam Egg Poachers, ₩ doz. No. 1, $6.00; No. 2, $9.00 ..... 33⅓&%
Silver & Co., 6-Ring, ₩ doz, $4.00; 8-Ring ..... $2.00

### Pokes, Animal—

Bishop s I. X. L. ..... ₩ doz $6.00
Bishop's Monarch ..... ₩ doz $4.50
Bishop's Pioneer ..... ₩ doz $4.00
Bishop's American ..... ₩ doz $3.00
Eagle, Double Stale ..... ₩ doz $5.75
Eagle, Single Stale ..... ₩ doz $3.75
Buckeye, Single Stale ..... ₩ doz $2.75
Bolding ..... ₩ doz $6.00
Metallic Horse Poke ..... ₩ doz $6.00

### Police Goods—

R. I. Tool Co., Handcuffs, $15.00 ₩ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₩ doz 10%
Tower's ..... 25%
Daley's Improved Handcuffs; 2 Hands, Polished, ₩ doz, $48.00; Nickeled, $57.00; 3 hands, Polished, ₩ doz, $72.00; Nickeled, $84.00 ..... 25%
J. P. Lovell's Police Goods ..... 25%

### Polish—

#### Metal—

Prestoline ..... 30%
Prestoline Paste ..... 33⅓&%
Gaston's Silver Compound ..... 33⅓&%

#### Stove—

Joseph Dixon's ..... ₩ gro, $6.00, 10%
Gem ..... ₩ gro, $4.50, 10%
Gold Medal ..... ₩ gro, $6.00, 25%
Lustro ..... ₩ gro, $4.75
Ruby ..... ₩ gro, $3.75
Rising Sun, 6 gro lots ..... ₩ gro, $5.50
Dixon's Plumbago ..... ₩ ℔ 8¢
Boynton's Noon Day ..... ₩ gro, $13.00
Parlor Pride Stove Enamel, ₩ gro,
Yates' Liquid, 2 3 5 10 gal
₩ gal. .$0.80 .70 .60 .50
Yates Standard Paste Polish, 10 ℔ cans, ₩ ℔ 12½¢
Jet Black ..... ₩ gro $3.50
Japanese ..... ₩ gro $3.50
Fireside ..... ₩ gro $2.50
Diamond O. K. Enamel ..... ₩ gro $12.00
Bonnell's Liquid Stove Polish, ₩ gro $9.00
Bonnell's Paste Stove Polish, ₩ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans ..... 12½¢
Black Jack Water Paste, 5 and 10 ℔ cans ..... 12½¢
Nickel Plate Paste ..... ₩ gro $6.00
Crown Paste ..... ₩ gro $7.20
Crown Paste in 5 and 10 ℔ pails, ₩ ℔ 12¢
Black Flag ..... ₩ gro $7.20
Black Flag, 5 and 10 ℔ pails ..... ₩ ℔ 12¢
Black Flag, liquid, in bottles, ₩ gro $8.00
Diamond Rock Nickel Cleaner ₩ gro $10 20
Raven Liquid, 6 oz. bottles ..... ₩ gro $8.00
Raven Liquid, 8 oz. bottles ..... ₩ gro $9.00
Raven Water Polish, large boxes ..... ₩ gro $7.20
Raven Paste in 5 lb. pails (cases of 6 pails), ₩ ℔ 10¢

### Poppers, Corn—

Round or Square,
1 qt. ..... ₩ doz $1.00; ₩ gr $8.00
1½ qt. ..... ₩ doz $1.00; ₩ gr $9 00
2 qt. ..... ₩ doz $1.50; ₩ gr $14.00

### Post Hole and Tree Augers and Diggers—

See *Diggers, Post Hole, &c.*

### Potato Parers—

See *Parers, Potato.*

### Pots—

#### Glue—

Tinned ..... 40&10@40&10&5%
Enameled ..... 40&10@40&10&5%
Family, Howe's "Eureka" ..... 40%
Family, L. F. C.'s "Handy" ..... 50%

### Powder—

#### In Canisters—

Fine Sporting, 1 ℔ each ..... }
Duck, 1 ℔ each ..... }
Rifle, 1 ℔ each ..... }
Rifle, ½ ℔ each ..... }

#### In Kegs—

Rifle, 25-℔ kegs ..... }
Rifle, 12½-℔ kegs ..... }
Rifle, 6¼-℔ kegs ..... }
Duck, 25-℔ kegs ..... }
Duck, 12½-℔ kegs ..... }
Duck, 6¼ ℔ kegs ..... }

For revised prices see Trade Report.

### Presses—

#### Fruit and Jelly—

Enterprise Mfg. Co. ..... 25%
Henis ..... ₩ doz $3.50
Shepard's Queen City ..... 40%
Silver & Co. ..... ₩ doz $2.75

### Pruning Hooks and Shears—See *Shears.*

### Pullers Nail—
Scranton.. ₩ doz., $18.00, 33⅓%
Giant, No. 1. ₩ doz., $13.00, 10%
Giant, No. 2 ₩ doz., $15.00, 10%
Pelican ₩ doz., $9.00, 25%
Eclipse ₩ doz., $24.00, 40%
Economy ₩ doz., $6.00

### Pulleys—
Hot House, Awning, &c. 66⅔@70%
Japanned Screw 60&10&10%
Brass Screw 70%
Japanned Side 60&10&10%
Moore's Side, Anti Friction 50%
Moore's Ceiling or End, Anti-Friction 40%
Moore's Dumb Waiter, Anti-Friction 50%
Moore's Electric Light 33⅓%
Japanned Clothes Line 60&10%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50 50&10@50&10&5%
Hay Fork, "Anti-Friction," 5 in. solid, $5 70 50%
Hay Fork, "F" Common and Patent Bushed 20%
Hay Fork, Tarbox Pat. Iron 20%
Hay Fork, Reed's Self-Lubricating 60%
Hay Fork, Moore's Anti-Friction 5 in. Wheel, ₩ doz., $12.00 40%
Shade Rack 45%
Tackle Blocks—See Blocks.
Shepard's Niagara, No. 25.. ₩ doz 23¢ net
Sash (Auger Mortise).
Common Sense 60%
Empire 60%
Ideal, Nos. 2, 4, 10 & 15 } 60% less 1¢ ₩
Acme } doz net.
Star }
On bbl. lots extra 5%.
Ideal, Nos. 25 and 55. .. ₩ doz. 22¢ net.

### Pumps—
Cistern, Best Makers 60@60&10%
Pitcher Spout, Best Makers 67½@70%
Pitcher Spout, Cheaper G'ds..75@75&10%

### Punches—
Saddler's or Drive, good.. ₩ doz., 60@65%
Bemis & Call Co.'s Cast Steel Drive.50&5%
Bemis & Call Co.'s Springfield Socket..65%
Spring, good quality.. ₩ doz., $2.50@$2.60
Spring, Leach's Pat 15%
Bemis & Call Co.'s Spring 50&5%
Bemis & Call Co.'s Check 55%
Solid Tinners', P., S. & W. Co., ₩ doz., $1.44 55%
Tinners' Hollow Punches, P., S. & W. Co 20&2%
Rice Hand Punches 15%
Avery's Revolving 40%
Avery's Sawset and Punch—See Sawsets
Niagara Hollow Punches 20&2%
Niagara Solid Punches 55%

### Rail—
Sliding Door, Wr't Brass.. ₩ ℔, 35¢, 40%
Sliding Door, Bronzed Wr't Iron.. ₩ ft., 7¢
Sliding Door, Iron, Painted.. ₩ ft., 4¢, 40%
Barn Door, Light..In. ½ ⅝ ¾
Per 100 feet $2.00 2.50 3.10, 10%
B.D. for N. E. Hangers—
Small. Med. Large.
Per 100 feet $3.15 2.70 3.25 Net
Terry's Steel Rail ₩ ft., 4½¢
Victor Track Rail, 7¢ ₩ foot 50&2%
Carrier, double braced, Steel Rail, ₩ foot 3½@4¢
Lundy Parlor Door, Planed Edge, ₩ ft.7¢
Moore's Steel Rail 25&10%
Moody Steel Rail ₩ ft., 5¢ 45%

### Rakes—
Cast Steel, Association g'ds..70@70&5&2%
Cast Steel, outside g'ds, 70@70&5&2%
Malleable 70@70&5%
Gibbs' Lawn Rake ₩ doz., $4.90
Gibbs' Canton Lawn Rake.. ₩ doz., $3.75
Gibbs' Acme Lawn Rake.. ₩ doz., $4.75
Gibbs' Favorite Lawn Rake. ₩ doz., $3.90
Gibbs' Crown Lawn Rake, No. 1. ₩ doz., $4.90; No. 2, $5.40
Oneida Lawn Rake ₩ doz., $6.00
Fort Madison Prize Bow Brace and Peerless 65%
Fort Madison Steel Tooth Lawn Rake, $6.00 25%

### Razors—
J. R. Torrey Razor Co. Net prices
Wostenholm and Butcher, $10 to £.... 10%
Jordan's AAA1, new list. Net prices
Jordan's Old Faithful, new list. Net prices
Galvanic ₩ doz., $15.00
Electric Cutlery Co. Net prices
Campbell Cutlery Co. 60%

### Razor Strops—
See *Strops, Razor.*

### Registers —
Moore's Japanned 75%
Moore's Electroplated 75%
Moore's Bronze Finishes 70%
Moore's Solid Bronze 65%
Moore's Stove Pipe 33⅓%

### Rings and Ringers—
#### Bull Rings—
Union Nut Co. 55%
Sargent's 75&10%
Hotchkiss' low list. 30%
Humason, Beckley & Co.'s 70&10%
Peck, Stow & W. Co.'s..50&10@50&10&10%
Ellrich Hdw. Co., White Metal, low list. 50@50&10%

#### Hog—
Top of the Hill Ringers ₩ doz $2.00
Top of the Hill Rings ₩ doz $1.25
Hill's improved Ringers ₩ doz $1.25
Hill's Old Style Ringers ₩ doz $1.12½
Hill's Tongs ₩ doz $3.00
Hill's Rings ₩ doz bxs $1.00
Perfect Rings ₩ doz bxs $1.50
Perfect Ringers ₩ doz $2.15@$2.25
Blair's Hog Ringers ₩ doz $2.00
Blair's Hog Rings ₩ doz 90¢@$1.00
Champion Ringers ₩ doz $2.00
Champion Rings, Double ₩ doz $2.25
Brown's Ringers ₩ doz $2.00
Brown's Rings ₩ doz $1.15@$1.25
Electric Hog Rings ₩ doz boxes $1.50
Electric Hog Ringers ₩ doz $2.00
Major Rings ₩ doz $1.25
Major Ringers ₩ doz $2.00

### Rivets and Burrs—
Norway Iron, list Nov. 17, '87....60&10%
Second quality 70%
Copper 60@60&10%
Coppere Iron, Betina Brand 50&5%

### Rivet Sets—See *Sets.*

### Roasting and Baking Pans—See *Pans, Roasting and Baking.*

### Rods—
Stair, Brass 25@30%
Stair, Black Walnut ₩ doz 40¢

### Rollers—
Barn Door, Sargent's list. ....60&10&10%
Acme Moore's Anti-Friction 55%
Union Barn Door Roller.... 70%
Moore's Barn Door Stay 50%
Thompson Mfg. Co.'s Lawn Rollers ..30%

### Rope—The following prices are f.o.b., New York or factory, and are shaded ¼¢@½¢ on large lots; terms, 1½% for cash.

| | | | |
|---|---|---|---|
| Manila, 7-16 in. diam. and larger | ₩ ℔ | 8 @ | 8¼¢ |
| Manila | ¾ in. ₩ ℔ | 8½@ | 8¾¢ |
| Manila | ¼ and 5-16 in. ₩ ℔ | 9 @ | 9¼¢ |
| Manila, Tarred Rope | ₩ ℔ | 7½@ | 7¾¢ |
| Manila, Hay Rope, Med'm | ₩ ℔ | 8 @ | 8¼¢ |
| Sisal, 7-16 in. and larger | ₩ ℔ | 5¾@ | 6 ¢ |
| Sisal | ⅜ in. ₩ ℔ | 7¼@ | 7½¢ |
| Sisal | ¼ and 5-16 in. ₩ ℔ | 6¾@ | 7 ¢ |
| Sisal, Hay Rope | ₩ ℔ | 5¾@ | 6 ¢ |
| Sisal, Tarred Rope | ₩ ℔ | 5¼@ | 5½¢ |
| Sisal, Medium Lath Yarn | ₩ ℔ | 5½@ | 5¾¢ |
| New Zealand, 7-16 in. and larger | ₩ ℔ | | 5¾¢ |
| New Zealand | ⅜ inch. ₩ ℔ | 5¾@ | 6 ¢ |
| New Zealand, ¼ & 5-16 in. | ₩ ℔ | 6¼@ | 6½¢ |
| New Zealand, Hay Rope | ₩ ℔ | 5½@ | 5¾¢ |
| New Zealand, Tar'd Rope | ₩ ℔ | 5 @ | 5¼¢ |
| Cotton Rope | ₩ ℔ | 13½@ | 16¢ |
| Jute Rope | ₩ ℔ | 6½@ | 7¢ |

### Wire—
List February, 1892. All kinds 45%

### Rules—
Boxwood.. 80&10&10@80&10&10&10%
Ivory 50&10%
Starrett's Steel Rules and Straight Edges 25&10%

### Sad Irons—See *Irons, Sad.*

### Sand and Emery Paper and Cloth—
See *Paper and Cloth.*

### Sash Cord—See *Cord, Sash.*

### Sash Locks—See *Locks, Sash.*

### Sash Weights—
See *Weights, Sash.*

### Sausage Stuffers or Fillers—See *Stuffers or Fillers, Sausage.*

### Saws—
*Note.*—Extra 5@10% often given.

Disston's Circular 45@45&5%
Disston's Cross Cut, list Jan. 1, '93 40&10%
Disston's Hand 25%
Woodrough & McFarlin.
Hand, Panel and Rip 25&10%
Cross Cuts, list Jan. 1, 1893 45&10%
Wheeler, Madden & Clemson Mfg. Co.
Hand, Panel and Rip 30&10%
Cross Cuts, list Jan. 1, 1893 45&10%
Atkins' Circular 50&10%
Atkins' Cross Cuts, new list. 40%
Atkins' Mulay, Mill and Drag 60&10%
Atkins' One-Man Saw 40%
Atkins' Wood Saws 40%
Peace Circular and Mill 45@45&5%
Peace Hand Panel and Rip 25@25&5%
Peace Cross Cuts, list Jan. 1, '93 45&10%
Richardson's Circular and Mill 45@45&5%
Richardson's X Cuts, list Jan. 1, '93 45&10%
Richardson's Hand, &c 25@25&5%
C. E. Jennings & Co.'s 25%
Simonds' Circular Saws 45@45&5%
Simonds' Crescent Ground Cross Cut Saws 30%
Simonds' Gang, Mill, Mulay and Drag Saws 45@45&5

#### Hack Saws—
Griffin's, complete 40&10@50
Griffin's Hack Saw Blades 40&10@50
Star Hack Saws and Blades 25%
Eureka and Crescent 25%

#### Scroll—
Lester, complete, $10.00 25%
Rogers, complete, $4.00 25%
Barnes' Builders' and Cab Makers' $15,25%
Barnes' Scroll Saw Blades 35%

### Saw Frames—
See *Frames, Saw.*

### Saw Sets—See *Sets, Saw.*

### Saw Tools—See *Tools, Saw.*

### Scales—
Hatch, Counter, No. 171, good quality, ₩ doz $18.00@$19.00
Hatch, Tea, No. 161 ₩ doz $6.50@$7.00
Union Platform, Plain $2.10@2.20
Union Platform, Striped $2.40@2.50
Chatillon's Grocers' Trip Scales 50%
Chatillon's Eureka 25%
Chatillon's Favorite 40%
Family, Turnbulls 80@30&10
Riehle Bros.' Platform 40%

### Scale Beams—
See *Beams, Scale.*

### Scissors, Fluting 45%

### Scrapers—
Adjustable Box Scraper (S. R. & L. Co.) $6.00 30&10%
Box, 1 Handle ₩ doz $2.00
Box, 2 Handle ₩ doz $3.00@$4.00
Defiance Box and Ship 20&10%
Foot 50&10@60%
Ship, Common ₩ doz $3.50
Ship, R. I. Tool Co. 10%

### Screen Window and Door Frames—See *Frames*

### Screw Drivers—
See *Drivers, Screw*

### Screws—
#### Bench and Hand—
Bench, Iron 55&10@55&10&10%
Bench, Wood, Beech ₩ doz $2.25
Bench, Wood, Hickory 20&10%
Hand, Wood 25&10@25&10&5%
Hand, Grand Rapids, list 35%

#### Coach, Lag and Hand-Rail—
Lag, Blunt Point, list Jan. 1, 1890 80&10@80&25%
Coach and Lag, Gimlet Point, list Jan. 1, 1890 80&10@80&20%
Hand Rail, Sargent's 70&10%
Hand Rail, H. & B. Mfg. Co. 70&10@75%
Hand Rail, Am. Screw Co. 75%

#### Jack Screws—
Jack Screws, Millers Falls list. 50@50&10%
Jack Screws, P., S. & W. 35%
Jack Screws, Sargent 70%
Jack Screws, Stearns' 40@40&10%

#### Cork—
Humason & Beckley Mfg. Co. 40&10@50%
Williamson's 33⅓@33⅓&5%
Williamson's Forged Worm, Apple-wood Handle, ₩ doz., $5.00; Rose-wood, $5.50 40%
Detroit Cork Screw Co. 33⅓%

#### Machine—
Flat Head Iron 65%
Round Head Iron 60%

#### Wood—
List January 1, 1891.
Flat Head Iron 70%
Round Head Iron 65%
Flat Head Brass 70%
Round Head Brass 65%
Flat Head Bronze 70%
Round Head, Bronze 65%
} Extra 10& often given.
Rogers' Drive Screws 82½%

### Scroll Saws—See *Saws, Scroll.*

### Scythes—
Grain 40&5@40&10%
Grass 40&10&50%

### Scythe Snaths—
See *Snaths, Scythe.*

### Sets—
#### Awl and Tool—
Aiken's Sets, Awls and Tools, No. 20, ₩ doz $10.00 60@60&5%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9 45%
Millers Falls Adj. Tool Hdls., No. 1, $12; No. 4, $12; No. 5, $18 25%
Henry's Combination Haft.. ₩ doz $6.50
Stanley's Excelsior:
No. 1, $7.50; No. 2, $4.00; No. 3, $5.50 30&10%
Common Brad Sets, No. 42, $10.50; No. 43, $12.50..70&10&5%

#### Nail—
Square ₩ gr. $4.00@$4.25
Round ₩ gr. $3.25
Buck Bros. 27½%
Cannon's Diamond Point.. ₩ gr. $12, 20%

#### Rivet—
Regular list. 70%

#### Saw—
Stillman's Genuine.. ₩ doz $5.00@7.75, 40&5%
Stillman's Pattern, Hand, ₩ doz $3.25; Cross Cut, $6.50 55@55&10%
Common Lever ₩ doz $2.00, 45@50%
Morrill's No. 1, $15.00 40&20%
No. 11, $16.00 40&20%
Nos. 3 and 4, Cross Cut, $23.00 40&20%
No. 5, Mill, $31.00 40&20%
No. 10, $15.50 40&20%
Leach's. No. 0, $8.00; No. 1, $15.. 15@20%
Nash's 20&10@40%
Hammer, Hotchkiss $5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. 45%
Bemis & Call Spring Hammer 30&5%
Bemis & Call Co.'s Plate 20%
Bemis & Call Co.'s Cross Cut 30&5%
Aiken's Genuine $13.00, 60@60&10%
Aiken's Imitation ₩ doz $3.00@$3.25
Hart's Pat. Lever 20%
Disston's Star 25%
Leopold 40&10@50%
Atkin's Lever ₩ doz No. 1, $6.00
Atkin's Criterion ₩ doz No. 1, $6.00
Croissant (Keller), No. 1, $15.00; No. 2, $24.00 40&10@50%
Avery's Saw Set and Punch 50%
Kohler's Royal ₩ doz $7.00
Kohler's Giant Royal ₩ doz $12.00
Crescent ₩ doz $3.00
Lloyd's Acme ₩ doz $15, 40&10%
Taintor Positive ₩ doz $18, 50%

### Sharpeners, Knife—
Larkins'.
Applewood Handles.. ₩ doz. $6.00, 40%
Rosewood or Cocobola. ₩ doz. $9.00 40%

### Shaves, Spoke—
Iron 45%
Wood 30%
Bailey's (Stanley R. & L. Co.) 40&10%
Stearns' 30&10%
Cincinnati 25&10%
Goodell's ₩ doz. $9.00 25%

### Shears—
American (Cast) Iron..75&10@75&10&5%
Barnard's Lamp Trimmers.. ₩ doz. $3.75
Seymour's, List Dec. 1881. 60&10&10@60&10&10&5%
Heinisch's, List Dec. 1881. 60&10&10@60&10&10&5
Heinisch's Tailor's Shears 33⅓%
Cast Steel Trimmers:
First quality 80@80&10%
Second quality 80&10@80&10&10%
Acme Cast Shears 10&10%
Diamond Cast Shears 10%
Clipper 10&10%
Victor Cast Shears 75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel 40%
Hatch Cutlery Co., Solid Steel Forged 60%
Davenport Cutlery Co. 60@60&10%
Clauss brand, Japanned 70%
Clauss brand, Nickeled, same list 60%
Galvanic 3½ to 0 in., ₩ doz. $1.00 ₩ inch
Electric Cutlery Co. Net
Campbell Cutlery Co., Jap'd 75%
Nickel Plated 65%

### Tinners' Snips—
Wrt. Handles, Steel Blades, .20@20&10%
Niagara Snips and Shears, 20&10%
Cast Handles, Laid with Steel 40%

### Pruning Shears and Hooks—
Disston's Combined Pruning Hook and Saw ₩ doz. $18.00, 20&10%
Disston's Pruning Hook, ₩ doz. $12.00 20&10%
E.S. Lee & Co.'s Pruning Tools. 50&10@70%
Pruning Shears, Henry's Pat. ₩ doz., $3.50@$4.00
Henry's Pruning Shears, ₩ doz. $4.25 @$4.50
Wheeler, M. & C. Co., Combination, ₩ doz $12.00
Dunlap's Saw and Chisel, ₩ doz $8.50, 30%
J. Mallinson & Co., No. 1, $5.25; No. 2, $7.25
P., S. & W. Co. 60%
Levin Pruner No. 1, $15.00 ₩ doz. 40&3%
Levin Pruner No. 2, $21.00 ₩ doz.. 40&3%

### Tinners', &c.—
Shears and Snips (P. S. & W.) 20@25%
Snips, J. Mallinson & Co 33⅓%

### Sheaves—
#### Sliding Door—
M. W. Co., list July 1888....50&10@60&5%
R. & E., list Dec. 18, 1885 55&20%
Corbin's list. 60&10&2%
Patent Roller 60&10&2%
Patent Roller, Hatfield's 75%
Russell's Anti-Friction, list Dec. 18, 1885 60&2%
Moore's Anti-Friction 50%

#### Sliding Shutter—
R. & E., list Dec. 18, 1885 60&10&2%
Sargent's list 70%
Reading list 60&10&10%

### Shells—
First quality 4, 8, 10 and 12 gauge 25&10&2%
First quality Rival, Club and Climax brands, 14, 16 and 20 gauge ($7.50 list) .20&10&2%
Prize 40&2%
Star, Club, Rival and Climax Brands... 33⅓&10&2%
Smokeless brand, 12, 10, 16 gauge. 33⅓&10&2%
Trap brand, 12 and 10 gauge..33⅓&10&2%
Selbold's Comb. Shot Shells 15&2%
Brass Shot Shells, 1st quality 60&2%
Brass Shot Shells, Club, Rival, Climax 65&2%

### Shells, Loaded—
Standard List, July 19, 1890 40&10&10@40&10&10&5%
7% cash, 10 days.

### Ship Tools—
L. & I. J. White 20&5

### Shoes, Horse, Mule, &c.
#### Horse—
Burden's, Perkins', Phœnix, Standard, Diamond State, Bryden's Boss and Crescent, at factory $4.00
Bryden's Frog Pressure, at factory. $5.00

#### Mule—
Add $1 ₩ keg to above prices.

#### Ox Wrought—
Ton lots ₩ ℔ 9¢
1000 ℔ lots ₩ ℔ 9½¢
500 ℔ lots ₩ ℔ 10¢

### Shot—
| | Small lots. |
|---|---|
| Drop, up to B, 25-℔ bag | $1.45 |
| Drop, up to B, 5-℔ bag | .35 |
| Drop, B and larger, 25-℔ bag | 1.70 |
| Drop, B and larger, 5-℔ bag | .40 |
| Buck and Chilled, 25-℔ bag | 1.70 |
| Buck and Chilled, 5-℔ bag | .40 |
| Dust Shot, 25-℔ bag | 2.00 |
| Dust Shot 5-℔ bag | .45 |

In ton lots a discount of ½¢ ₩ bag (25 ℔) is made, and 2½% for cash.

### Shovels and Spades—
Ames' Shovels, Spades, &c., list Nov. 1, 1885 20%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron 50&10%
Griffith's C. S. 60@60&5%
Griffith's Solid C. S. R. R. Goods. 20%
St. Louis Shovel Co. 20@20&7½%
Hussey, Binns & Co. 15@25%
Hubbard & Co. 20@20&7½%
Lehigh Mfg. Co. 50&10%
H. M. Myers Co. 30%
Payne Pettebone & Son 33⅓ &5%
Remington's (Lowman's Pat.) 40&10@50%
Rowland's Black Iron.. 50&10@50&10&5%
Rowland's Steel 60&5@60&10%
Terra Haute Shovel & 25%

### Shovels and Tongs—
Iron Head 60&10@60&10&5%
Brass Head 60&10&10%

### Sieves and Sifters—
Mann's Tin Rim 50&25%
Buffalo Metallic, S. S. & Co.... 50&25&20%
Shaker (Barler's Pat.) Flour Sifters ₩ gr $21 00
Electric Light.. ₩ doz $1.50; ₩ gro $15.00
A. & W. Sifters ₩ gr $15.00
Hunter's Genuine.. ₩ doz $1 75, ₩ gr $16.50
Hunter's Imitation ₩ doz $1.75; ₩ gr $15.00

### Sieves, Wooden Rim—
| | Iron | Plated |
|---|---|---|
| Mesh 18, Nested, ₩ doz | $0.80 | $1.00 |
| Mesh 20, Nested, ₩ doz | .95 | 1.10 |
| Mesh 24, Nested, ₩ doz | 1.15 | 1.25 |

### Sinks, Wrought Steel—
Columbus, Painted or Unpainted 30@30&10%
Columbus, Galvanized and Enameled. 50@50 &10%
New Era, Painted 40&10@50&5%
New Era Galvanized and Enameled 60&10&10@70&5%

### Skeins, Thimble—
Western list 7&5@75&10%
Columbus Wrt. Steel. Special net prices
Coldbrookdale Iron Co. 60%
Seneca Falls Pattern 60%
Utica P. S. T. Skeins 60%
Utica Turned and Fitted 35%

### Slates—
School, by case 40@40&10%
Large lots 40&10&5@50%

### Slaw Cutters—See *Cutters.*

### Sleds Hand—
Tubular Steel ₩ doz. $24&50%.00, 40 (Lots of 6 doz. 50%)

## Snaps, Harness, &c.—

Anchor (T. & S. Mfg. Co.).....65%
Fitch's (Bristol).....50&10%
Hotchkiss .....10%
Andrews .....50%
Sargent's Patent Guarded.....70&10&10%
German, new list .....40&10%
Covert.....50&10&5&2%
Covert, New Patent.....50&10&5&2%
Covert, New R. E.....60&10&5&2%
Covered Spring.....60&10&10%
Covert's Saddlery Works' Triumph.33⅓&%
John Protz Snaps.....75@75&5%
Kelley & Woolworth's Steel Harness..
50&10@60%

## Snaths—

Scythe .....50&2@50&5&2%

## Soldering Irons—

See *Irons, Soldering.*

## Spittoons, Cuspidors, &c.

### Standard Fiberware—

Cuspidors, 8¼-inch, ₩ doz., No. 5, $8; No. 5X, $9.
Spittoons, Daisy, 8-inch, No. 1, 4; 10 and 11 inch, $6.

## Spoke Shaves—

See *Shaves, Spoke*

## Spoke Trimmers—

See *Trimmers, Spoke.*

## Spoons and Forks—

### Tinned Iron—

Basting, Cen. Stamp. Co.'s list.....70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list .....70&10%
Buffalo, S. S. & Co.....33⅓&2%

### Silver Plated—

4 months or 5% cash 30 days:
Meriden Brit. Co., Rogers.....40&15%
Rogers & Hamilton.....40&15%
C. Rogers & Bros.....40&15%
Rogers & Bros.....40&15%
Reed & Barton.....40@40&5%
Wm. Rogers Mfg. Co.....40, 15&5%
Simpson, Hall, Miller & Co.....40, 15&5%
Holmes & Edwards Silver Co....40, 15&5%
L. Boardman & Son.....60&12½&%

### Miscellaneous—

Holmes & Edwards Silver Co.:
No. 67 Mexican Silver.....50&10&5%
No. 30 Silver Metal.....50&10&5%
No. 24 German Silver.....50&10&5%
No. 50 Nickel Silver.....50&5%
No. 48 Nickel Silver.....50&10&5%
Wm. Rogers Mfg. Co.:
Rogers' Silver Metal.....50&10&6%
18% Rogers' German Silver.....60&6%
22% Rogers' Nickel Silver.....50&6%
Rogers & Hamilton:
Steel Goods.....40&10%
Cimetar, Flatware.....40&15&5%
Cimetar, Steel Goods.....40&10%
Crown Hamliton, Flatware and Cutlery.....30%
German Silver.....60@60&5%
Nickel Silver .....50&5@50&10&5% cash
Brittannia .....60@60&5%
Boardman's Nickel Silver, list July 1, 1891 .....60&7½&5%
Boardman's Brittannia Spoons, case lots .....60&5% cash

## Springs—

### Door—

Torrey's Rod, 39 in.....₩ doz $1.20@1.2
Warner's No. 1, ₩ doz $1.50; No. 2, $3.40 .....55@55&10%
Gem (Coil), list April 19, 1886.....20%
Star (Coil), list April 19, 1886.....20&10%
Victor (Coil) .....60&10@60&10&5%
Champion (Coil).....60&10@60&10&10%
Cowell's, No. 1, ₩ doz $18.00; No. 2, $15.00 .....50@50&10%
Rubber, complete, ₩ doz $4.50.....55&10%
Hercules .....50@50&10%
Phœnix.....33⅓&%

## Carriage, Wagon, &c.—

Elliptic, Concord, Platform and Half Scroll.....
60&10@60&10&10&10 or net prices
Cliff's Bolster Springs.....25%

## Squares—

Steel and Iron, Nickel-Plated.....80&10&10@80&25%
Try Square and T Bevels.....60&10&10%
Disston's Try Square and T Bevels....50%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares. 25%
Avery's Flush Bevel Squares.....40%
Avery's Bevel Protractor.....50%

## Squeezers—

### Fodder—

Blair's .....₩ doz $2.00
Blair's "Climax".....₩ doz $1.25

### Lemon—

Porcelain Lined, No. 1....₩ doz $6.00 25&30%
Wood, No. 2.....₩ doz $3.00, 35%
Wood, Common.....₩ doz $1.70@1.75
Dunlap's Improved.....₩ doz $3.75, 20%
Sammis ..No. 1, $5.00; No. 2, $9; 12, $18 ₩ doz .....25&10%
Jennings' Star.....₩ doz $2.50
The Boss .....₩ doz $2.50
Dean's..No. 1, ₩ doz $6.50; 2, $3.35; 3, $1.90; Queen, $2.50
Little Giant .....50@50&5%
King .....40&5%
Hotchkiss Straight Flash....₩ doz $12.00
Silver & Co..Glass .....₩ gro. $9.00

## Standard Fiber Ware—

See *Ware, Standard Fiber.*

## Staples—

Barbed Blind, ½ in. and larger.₩ ℔ 7@7½&%
Barbed Blind, ¾ in.....₩ ℔ 8@8½&%
Fence Staples, Galvanized. } Same price as B'rb Wire
Fence Staples, Plain..... } See Trd. Rep
Grand Crossing Tack Co.'s list....75&10%

## Steelyards .....40&10@50%

## Stocks and Dies—

Blacksmith's:
Waterford Goods .....35%
Butterfield's Goods.....35%
Lightning Screw Plate .....25@30%
Reece's New Screw Plates.....25@30%
Reversible Ratchet .....30%
Gardner .....25%
Green River .....25@30%

## Stops Bench—

Morrill's, ₩ doz, No. 1, $10.00; No. 2, $11.00 .....40&20%
Hotchkiss'.....₩ doz, $5, 10@10&10%
Weston's, No. 1, $10, No. 2, $9, 25&10&5%
McGill's, ₩ doz $3.....10%
Cincinnati.....25&10%
Terrell's Nos. 1 and 2, ₩ doz., $3; No. 3, $3.60.....30%
Millers Falls.....25%
Stearns' .....20&10%

## Stone—

### Stones, Grind—See *Grindstones.*

### Scythe Stones—

Pike Mfg. Co., list April, 1892.....33⅓&%
Cleveland Stone Co., list Nov. 1892..33⅓&%

### Oil Stones, &c.—

Pike Mfg. Co:
Hindostan No. 1, ₩ ℔....8¢
Sand Stone.....5¢
Turkey Oil Stone, 4 to 8 in .....80¢ } 40 @ 40& 10%
Turkey Slips.....$2.00
Lily White Washita.....60¢
Rosy Red Washita.....60¢
Washita Stone, Extra.....60¢
Washita Stone, No. 1.....40¢
Washita Stone, No. 2.....30¢
Lily White Slips.....90¢
Rosy Red Slips.....90¢
Washita Slips, Extra.....80¢
Washita Slips, No. 1.....70¢
Arkansas Stone, No. 1, 3 to 5½ in., $2.80 } 33⅓@33⅓&10%
Arkansas Stone, No. 1 5½ to 8 in., $3.50
Lake Superior.....₩ ℔ 13¢
Lake Superior Slips.....₩ ℔ 20¢

## Stove Polish—

See *Polish, Stove.*

## Stretchers Carpet—

Cast Steel, Polished .....₩ doz $2.2
Cast Iron, Steel Points.....₩ doz 75@80¢
Socket.....₩ doz $1.75
Bullard's.....25@25&10%

## Strops, Razor—

Genuine Emerson.....60@60&5%
Imitation " ..₩ doz $2.00. 20&10&5%
Torrey's.....Net prices
Badger's Belt and Com.....₩ doz $2.00
Lamont Combination.....₩ doz $4.00
Jordan's Pat. Padded, list Nov. 1, '89. 50%
Electric Cutlery Co .....Net prices
Campbell Cutlery Co.....Net prices

## Stuffer, Sausage—

Miles' Challenge, ₩ doz $20.....50@50&5%
Perry....₩ doz, No. 1, $15.00; No. 0, $21.00.....50&5@50&10%
Draw Cut No. 4, each $30.00.....20%
Enterprise Mfg. Co., list Jan 17, '93..25%
Silver's.....40&10%

## Sweepers, Carpet and Lawn—

### Carpet—

Bissell No. 5.....₩ doz $17.00
Bissell No. 8.....₩ doz $20.00
Bissell, Grand.....₩ doz $36.00
Standard.....₩ doz $24.00
Domestic.....₩ doz $21.00
Domestic, No. 2.....₩ doz $22.00
Grand Rapids.....₩ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic.....₩ doz $15.00
Improved Parlor Queen, Nickeled.....₩ doz $27.00
Japanned.....₩ doz $24.00
Excelsior.....₩ doz $22.00
Garland.....₩ doz $18.00
Parlor Queen.....₩ doz $24.00
Housewife's Delight.....₩ doz $15.00
Ladies' Friend.....₩ doz $15.00
Ladies' Friend No. 2.....₩ doz $16.00
Advance.....₩ doz $18.00
Our Leader.....₩ doz $19.00
Triumph.....₩ doz $20.00
Supreme .....₩ doz $22.00
Easy..Jap'd, ₩ doz $22.00; Nickel, $24.00
Gilt Edge.....₩ doz $24.00
Acme.....₩ doz $26.00
Imperial.....₩ doz $26.00
Grand Republic.....
Jap'd, ₩ doz $30.00; Nickel, $33.00
Banner.....
Jap'd, ₩ doz, $22.00; Nickel, $24.00
The Star.....₩ doz $21.00
Reliable.....₩ doz $22.00
Rapid..Jap'd, ₩ doz, $22.00; Nickel, $24.00
Our Own.....₩ doz $27.00
Model.....₩ doz $27.00
Goshen Sweeper Company, Grand Rapids, Mich., make the following rebates:
5 dozen in 6 months.....₩ doz $1.00
10 dozen in 6 months.....₩ doz $2.00
Except on L.F., when 10 dozen price is $13.50, and 25 dozen $13.00.

### Lawn—

Thompson Mfg. Co.....30%

## Swings—

Davies Lawn.....25%

## Tacks, Brads &c.—

List October 19, 1889. Old established straight Weights. Short Weight goods are sold at lower prices.

Carpet Tacks—
American, Blued.....66⅔&%
American, Tin'd and Cop'd.....70%
Steel, Bright and Blued.....66⅔&%
Steel, Tinned and Coppered.....70%
Swedes Iron, Blued.....72½&%
Swedes Iron, Tinned.....75%
American Iron Tacks, Domestic.66⅔&%
Swedes Iron Tacks—
S. S., Blued.....66⅔&%
S. S., Tinned.....70%
Lanc., Blued.....55%
Lanc., Tinned.....60%
Gimp and Lace Tacks—
S. S., Blued.....62½&%
S. S., Tinned.....66⅔&%
Lanc., Blued.....55%
Lanc., Tinned.....60%
Basket and Trimmers' Tacks—
Lanc.....52½&%
S. S.....55%
Hungarian Nails.....60%
Common and Patent Brads.....55%
Leathered Tacks.....10%
Brush Tacks, S. S.....60%
Looking Glass Tacks, S. S.....35%
Picture-Frame Points, S. S.....35%
Finishing Nails.....60%
Trunk and Clout Nails—
Black.....65%
Tinned or Coppered.....67½&%
Basket Nails.....60%
Chair Nails.....62½&%
Cigar Box Nails.....45%
Tin Capped Nails.....50%

Extra discount 25&2%

### Miscellaneous—

Double Point .....90&10@90&10&10%
Wire Carpet Nails .....50&10%
Claw Handle Carpet.....₩ gross $4.00
Bonnie Blue .....₩ box $1.50
Bill Nye Brad Box.....4 00
Parisian Gilt Nails, cartoon.....50
Home Tacks, No. 50 ₩ case (12 cartons), $36.00; No. 100, ₩ case (12 cartons), $72.00. } 50@2%
Home Nails, No. 200, ₩ case (12 cartons), $30.00; No. 400, ₩ case (12 cartons), $60 00.
Upholsterers' Nails.....50&10%

### Wire Brads and Nails

Steel-Wire Brads, R. & E. Mfg. Co.'s list 50&10%
See also *Nails, Wire.*

## Tanks, Oil—

Emerald, S. S. & Co.: 30-gal. $8.75; 60-gal., $11 each.....50&10&5%

## Tapes, Measuring—

American.....40@40&10%
Spring.....40%
Chesterman's, Regular list.....25@30%

## Thermometers—

Tin Case.....80@80&10%

## Thimble Skeins—See *Skeins.*

## Ties, Bale—Steel.

Standard Wire, list.....50&10&5%

## Tinners' Shears, &c.—

See *Shears, Tinners' &c.*

## Tinware—

Stamped, Japanned and Pieced, list Jan 20, 1887.....70&10@70&25%

## Tire Benders, Upsetters, &c.—See *Benders and Upsetters Tire.*

## Tobacco Cutters—

See *Cutters, Tobacco.*

## Tools—

### Coopers'—

Bradley's.....20%
Barton's.....20@20&5%
L. & I. J. White .....20&5%
Albertson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%
Shaves Cincinnati Tool Co.....20%

### Lumber—

Ring Peavies, "Blue Line"..₩ doz $20.00
Ring Peavies, Common.....₩ doz $18.00
Steel Socket Peavies.....₩ doz $21.00
Mall. Iron Socket Peavies...₩ doz $19.00
Cant Hooks, "blue Line"....₩ doz $16.00
Cant Hooks, Common Finish..₩ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish.....₩ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₩ doz $14.00
Cant Hooks, Clip Clasp, Common Finish.....₩ doz $12.00
Hand Spikes....₩ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₩ doz, 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₩ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₩ doz, 12 ft., $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₩ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00.
Swamp Hooks.....₩ doz $18.00

### Saw—

Atkins'. new list..... 40¢
Simonds'.....33⅓&%

## Transom Lifters—

See *Lifters, Transom.*

## Traps—

### Game—

Newhouse.....40@40&5%
Oneida Pattern.....75@75&10%
Game, Blake's Patent.....40&10&5%

### Mouse and Rat—

Mouse Wood, Choker, ₩ doz holes, 9@10¢
Mouse, Round Wire.....₩ doz $1.50 10%
Mouse, Cage, Wire.....₩ doz $2.50 10%
Mouse, Catch-'em-alive..₩ doz $2.50 15%
Mouse, Bonanza.....₩ doz 0.90@$1.00
Rat, Decoy.....₩ gr $10.00, 10%
Ideal.....₩ gr $10.00
Cyclone.....₩ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₩ doz., 75¢; in full cases, ₩ doz.60@65¢
Hotchkiss Imp. Rat Killer...₩ gro $18.50
Hotchkiss New Rat Killer...₩ gro $16.50
Schuyler's Rat Killer.....₩ gro $15.00
Dandy.....₩ doz., $1.75
Waddel's Go Bang, ₩ gro.....$12.50

### Fly—

Harper, Champion or Paragon.....
₩ doz. $1.75, ₩ gro. $16.50
Balloon, Globe or Acme .....
₩ doz. $1.50, ₩ gro. $13.50

## Triers—

Butter and Cheese.. .....25%

## Trimmers, Spoke—

Bonney's.....₩ doz $10.00, 50%
Stearns' .....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₩ doz. 55&10%
Douglas'.....₩ doz $9.00, 20%
Cincinnati .....25%

## Trowels—

Lothrop's Brick and Plastering, .....20&10&5@35%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering.25@25&10%
Peace's Plastering.....25@25&5%
Clement & Maynard's.....20@20&5%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%
Cleves' Angle Trowel, ₩ gro, No. 1, $36; No. 2, $30; No. 3, $15. net @ 10%

## Trucks, Warehouse, &c.—

B. & L. Block Co.'s list.....40%
Thompson Mfg. Co .....40%
Barnes' Barrel Trucks.....40%
Daisy Stove Trucks, Improved pattern, ₩ doz. $18.00

## Tubes. Boiler—

See Pipe.

## Twine—

Flax Twine—

| | BC. | B. |
|---|---|---|
| No. 9, ¼ and ⅜ ℔ Balls | 25¢ | 31¢ |
| No. 12, ¼ and ⅜ ℔ Balls | 22¢ | 30¢ |
| No. 18, ¼ and ⅜ ℔ Balls | 20¢ | 29¢ |
| No. 24, ¼ and ⅜ ℔ Balls | 20¢ | 29¢ |
| No. 36, ¼ and ⅜ ℔ Balls | 18¢ | 28¢ |

No. 264 Mattrass, ¼ and ⅜ ℔ Balls, 52@54¢
Chalk Line, Cotton, ½ ℔ Balls.....25¢
Mason Line, Linen, ½ ℔ Balls.....55¢
2-Ply Hemp, ¼ and ⅜ ℔ Balls (Spring Twine).....15½¢
3-Ply Hemp, 1 ℔ Balls.....16¢@16½¢
3-Ply Hemp, 1½ ℔ Balls.....15¢@15½¢
Cotton Wrapping, 5 Balls to ℔..15¢@16¢
2, 3, 4 and 5 Ply Jute, ½ ℔ Balls 10¢
Wool.....6½¢@6¾¢
Paper.....13¢@14¢
Cotton Mops, 6, 9, 12 and 15 ℔ to doz.18¢

## Vises—

Solid Box .....50&10@60%

### Parallel—

Fisher & Norris Double Screw.....15&10%
Stephens'.....25@30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....50%
Millers' Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@20%
Hollands'.....35@40%
Sargent's.....70&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20@25%
Simpson's Adjustable.....40%
Moore's.....20%
Massey Quick Action.....20@25%

## Saw Filers—

Bonney's, Nos. 2 & 3, $15.00....40&10@50%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓@35%
Hopkins'.....₩ doz $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%
Economy, ₩ doz., Nos. 110, $10.00; 120, $15.00.....50&10&10&5¢

## Miscellaneous—

Phœnix Vises.....33⅓&%
Phœnix Hand Vises....₩ doz $3.60, 33⅓&%
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%
Cincinnati.....25&10%
Enterprise Pipe Vises.....each $3.00, 40%
Massey Combination Pipe Vise.....40%

## Wads—Price Per M.

U.M.C.&W.R.A.—B. E., 11 up.. 68¢
U.M.C.&W.R.A.—B. E., 9&10.. 82¢
U.M.C.&W.R.A.—B. E., 8..... 96¢
U.M.C.&W.R.A.—B. E., 7..... $1.10
U.M.C.&W.R.A.—P. E., 11 up 1.15
U.M.C.&W.R.A.—P. E., 9&10. 1.50
U.M.C.&W.R.A.—P. E., 8..... 1.70
U.M.C.&W.R.A—P. E., 7 ..... 1.80
Eley's B. E., 11 and larger.... $1.70@$1.75
Eley's P. E., 12 to 20.....$3.00@$3.25

Dis 20&2%

## Wagon Boxes—

See *Boxes, Wagon.*

## Wagon Jacks—

See *Jacks, Wagon.*

## Ware, Hollow—

### Cast Iron, Hollow-

Stove Hollow-Ware—
Ground .....60&10@60&10&10%
Unground.....65&10@70&5
White Enameled Ware—
Maslin Kettles.....70&10@75%
Boilers and Saucepans.....60@60&5%
Tinned Boilers and S'pans.....60@60&5%
Rustless Hollow Ware.....50@50&5%
Gray Enameled Ware—
Stove.....50%
Maslin Kettles.....60@60&10%
Boilers and Saucepans.....40&5%

### Enameled—

Agate and Granite Ware, list Jan. 1, 1889.....33⅓&% } Extra 10% on many leading articles.
Ironclad Enameled Ware.....dis 33⅓&10%

### Kettles—

Galvanized Tea-Kettles—

| Inch | 6 | 7 | 8 | 9 |
|---|---|---|---|---|
| Each | 55¢ | 60¢ | 65¢ | 75¢ |

### Standard Fiber

| | Per Doz. Plain. | Decorated. |
|---|---|---|
| Wash-Basins, 10¼ in. | $1.80 | $2.00 |
| Wash-Basins, 12 in. | 2.00 | 2.50 |
| Keelers, 11½ in. | | 3.00 |
| Cuspidors | | 7.50 |
| Spittoons, "Daisy," 8 in. | 3.50 | 4.00 |
| Peck Measure | 3.50 | |
| Half-peck Measure | 3.00 | |

See also Pails.

### Indurated Fiber.—

Spittoons No. 2, ₩ doz. ..... $6.00
Basins, Ringed, ₩ doz., No. 2 ..2.80
Washtubs, Nested, Nos. 0, 1, 2, and 3 (4 pieces), ₩ nest..... $5.75
Keelers Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₩ nest..... $2.55
Butter Bowls 15, 17 and 19-inch (3 pieces), ₩ nest..... $1.50
Liquid Measures, pt., qt., 2 qt. and funnel (4 pieces), ₩ set.....$1.20

25%

See also Pails.

### Silver Plated, Hollow

4 mo. or 5% cash in 30 days.
Reed & Barton.....
Meriden Britannia Co..... } 40&5%
Simpson, Hall, Miller & Co..... }
Rogers & Brother..... }
Hartford Silver Plate Co..... } 40&5&5%
William Rogers Mfg. Co..... }

## Washers—

Size hole..... 5-16 ⅜ ½ ⅝ to 1¾
Washers..... 5½ 4½ 3½ 2¾
In lots less than 200 ℔, ₩ ℔, add ¼¢, 5-℔ boxes 1¢ to list.

## Washer Cutters—

See *Cutters, Washers.*

## Water Coolers—

See *Coolers, Water.*

## Wedges—

Iron.....₩ ℔ 3¼¢@3½¢
Steel.....₩ ℔ 3½¢

## Weights, Sash—

Solid Eyes.....₩ ton, $18.00@19.00

## Well Buckets Galvanized—See *Buckets, Well Galvanized.*

## Wheels, Well—

8 in., $2.00; 10 in. $2 50· 12 in 75 82.

## Whips

| | Length. | 4½ | 5 | 5½ | 6 | 6½ | 7 | 7½ | 8 ft. |
|---|---|---|---|---|---|---|---|---|---|
| American Whip Co.: | | | | | | | | | |
| X. L. Whalebone Driving | | $18.00 | 20.00 | 22.00 | 24.00 | 27.00 | 30.00 | 33.00 | 36.00 |
| Eureka, Two-thirds Whalebone. | | .... | .... | 15.00 | 16.50 | 18.00 | 20.00 | .... | .... |
| Bull Bone, Half-length Whale bone | | .... | .... | 11.00 | 12.00 | 13.00 | 15.00 | .... | .... |
| American Standard | | 8.00 | 8.50 | 9.50 | 10.50 | 12.00 | 13.50 | 15.00 | 16.50 |
| True Grip, Raw Hide Center | | 6.00 | 6.00 | 6.50 | 7.00 | 7.50 | 9.00 | .... | .... |
| New Name, Stocked Java, Black and Wine Colors | | .... | .... | .... | 6.00 | .... | .... | .... | .... |
| Americus, 93 Pen Whip | | .... | .... | .... | 6.00 | .... | .... | .... | .... |
| Gents' Light Driving No. 111 | | .... | .... | .... | 6.00 | .... | .... | .... | .... |
| Gents' Light Driving No. 106 | | .... | .... | .... | 5.00 | .... | .... | .... | .... |
| Hand-made Stocked Java No.103 | | .... | .... | 3.75 | 4.00 | .... | .... | .... | .... |

Per dozen.

A large variety of cheaper grades.....50@$3.00
Team Whips.....$2.00@$7.50
Toy Whips.....₩ gro. $2.50@$12.00
Hardware Assortment, 10/American, 75 Whips for $50.00.

## Wire and Wire Goods—

### Iron—

Market,

Br. & Ann., Nos. 0 to 18, 75&10@75&10&5%
Cop'd, Nos. 0 to 18, 75&5%
Galv., Nos. 0 to 18, 70&5@70&10%
Tin'd, Tin'd list, Nos. 0 to 18, ..70@70&10%

} Extra 5@10% often given and low net prices often made on large lots.

Stone,
Br. and Ann'd,
Nos. 16 to 18.... ....80%
Nos. 19 to 26.... ..80&5%
Nos. 27 to 36....82½&5%
} Extra 10% often given.

Tinned Broom Wire, 18 to 21, ₩ ℔....4½¢
Galvanized Fence .....75&10%
Brass, list Jan. 18, 1884.....40&5%
Copper, list Jan. 18, 1884.....40@5%
Annealed Wire on Spools.....60%
Malin's An'aled & Tin'd on Spools..60&5%
Malin's Brass and Cop. on Spools...50&5%
Ossawan Mills, An'ld and Tinned on Spools.....60&10%
Ossawan Mills, Brass and Copper on Spools.....50&10%
Tate's Spooled, Tin'd & Annealed..60&5%
Tate's Spooled Cop. and Brass.....50%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to 2, 30%
Steel Music Wire, 12 to 30, imported.... 60@70¢ ₩ ℔
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

### Bright Wire Goods—

Standard list.....85&10@85&10&10%

### Wire Cloth and Netting—

Painted Screen Cloth ₩ 100 ft.....$1.50
Galvanized Wire Netting..... 75&10@75&10&5%

### Wire Barb—

See Trade Report.

### Wire Rope—

See *Rope, Wire.*

### Wrenches—

American Adjustable ..... .....40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....60%
Coes' Genuine.....50@50&10%
Coes' "Mechanics'".....50&10&3%
Girard Standard.....65&10@70%
Lamson & Sessions' Engineers'....60&10%
Lamson & Sessions' Standard.....70&10%
P. S. & W. Agricultural.....
Girard Agricultural.....
Lamson & Sessions' Agric'l..
W. & B. Diamond.....
} 75&10@80%

Bemis & Call's:
Pat. Combination Bright .....40&5%
Pat. Combination Black.....40&10%
Merrick's Pattern.....45%
Brigg s Pattern.....30&10%
Cylinder or Gas Pipe.....45&5%
No. 3 Pipe.....55%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₩ doz., $4.00, 40%
Webster's Pat. Combination .....25%
Boardman's.....30%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Eagle.....50&10%
Acme, Bright.....50&2%
Acme, Nickeled.....40&2%
Hercules.....70@70&5%
Walker's.....55&3%
Diamond Steel.....55&3%
Cincinnati Brace Wrenches.....25&10%
Tafts' Vise Wrench.....55&10&3%

## Wringers, Clothes—

Am. Wringer Co.'s list, July 1, '93..2% cash
Colby Wringer Co., list Sept. 1, '91..2% cash
Lovell Mfg. Co., list July 1, 1892..2% cash
Peerless Mfg. Co., list Feb., 1892..2% cash
National Wringer & Mfg. Co., list June 1, 1892.....2% cash

## Wrought Goods—

Staples, Hooks, &c., list, March 17, 1892 85&10@85&15%

# Paints, Oils and Colors.—Wholesale Prices.

## Animal and Vegetable Oils—

| | | | |
|---|---|---|---|
| Linseed, City, raw, per gal. | .. | @ | 40 |
| Linseed, City, boiled | .. | @ | 43 |
| Linseed, Western, raw | 38 | @ | 40 |
| Lard, City, Extra Winter | 76 | @ | 77 |
| Lard, City Prime | 75 | @ | 76 |
| Lard, City, Extra No. 1 | .. | @ | 50 |
| Lard, City, No. 1 | .. | @ | 45 |
| Lard, Western, prime | .. | @ | 75 |
| Cotton-seed, Crude, prime | .. | @ | 30 |
| Cotton-seed, Crude, off grades | 27 | @ | 29 |
| Cotton-seed, Summer Yellow, prime | 38 | @ | 39 |
| Cotton-seed, Summer Yellow, off grades | 34 | @ | 36 |
| Sperm, Crude | 65 | @ | .. |
| Sperm, Natural Spring | 66 | @ | 68 |
| Sperm, Bleached Spring | 71 | @ | 73 |
| Sperm, Natural Winter | 71 | @ | 73 |
| Sperm, Bleached Winter | 76 | @ | 78 |
| Whale, Crude | .. | @ | .. |
| Whale, Natural Winter | .. | @ | 45 |
| Whale, Bleached Winter | .. | @ | 48 |
| Whale, Extra Bleached | .. | @ | 50 |
| Sea Elephant, Bleached Winter | .. | @ | .. |
| Menhaden, Crude, Sound | 35 | @ | .. |
| Menhaden, Crude, Southern | .. | @ | .. |
| Menhaden, Light Pressed | 39 | @ | 40 |
| Menhaden, Bleached W'ter | .. | @ | 43 |
| Menhaden, Extra Bleached | .. | @ | 46 |
| Tallow, City, prime | .. | @ | 55 |
| Tallow, Western, prime | .. | @ | 50 |
| Cocoanut, Ceylon | 5½ | @ | 5¾ |
| Cocoanut, Cochin | 6½ | @ | 6¾ |
| Cod, Domestic | 38 | @ | 40 |
| Cod, Foreign | 42 | @ | 45 |
| Red Elaine | 44 | @ | 46 |
| Red Saponified ₩ ℔ | 4¼ | @ | 4¾ |
| Bank, per gal | 38 | @ | .. |
| Straits | 39 | @ | .. |
| Olive, Italian, bbls | 58 | @ | 62 |
| Neatsfoot, prime | 50 | @ | 65 |
| Palm, prime, Lagos ₩ ℔ | 7¾ | @ | 8¼ |

## Mineral Oils—

| | | | |
|---|---|---|---|
| Black, 29 gravity, 25 @ 30 cold test, per gal | 7 | @ | 7½ |
| Black, 29 gravity, 15 cold test | 7½ | @ | 8 |
| Black, 29 gravity, summer | 6 | @ | 6¼ |
| Cylinder light, filtered | 14 | @ | 16 |
| Cylinder, dark, filtered | 10 | @ | 13 |
| Paraffine, 23½ @ 24 gravity | 11 | @ | 12 |
| Paraffine, 25 gravity | 10 | @ | 11 |
| Paraffine, 28 gravity | 7½ | @ | 8 |
| Paraffine, red | 6½ | @ | 10½ |

## Paints and Colors—

| | | | |
|---|---|---|---|
| Barytes, Foreign, ℔ ton | $22.00 | @ | 24.00 |
| Barytes, Amer. floated | 29.00 | @ | 32.00 |
| Barytes, Amer. No. 1 | 16.00 | @ | 18.00 |
| Barytes, Amer. No. 2 | 13.00 | @ | 15.00 |
| Barytes, Amer. No. 3 | 11.00 | @ | 12.00 |
| Blue, Celestial ₩ ℔ | 6 | @ | 8 |
| Blue, Chinese | 40 | @ | 50 |
| Blue, Prussian | 25 | @ | 40 |
| Blue, Ultramarine | 8 | @ | 25 |
| Brown, Spanish | ½ | @ | 1 |
| Brown, Vandyke, Amer | 3 | @ | 3½ |
| Brown, Vandyke, English | 6 | @ | 8 |
| Carmine, No. 40, in bulk | 2.75 | @ | .. |
| Carmine, No. 40, in boxes or barrels | 2.85 | @ | .. |
| Carmine, No. 40, in ounce bottles | 3.75 | @ | .. |
| Chalk, in bulk ₩ ton | 1.75 | @ | 2.00 |
| Chalk, in bbls. ₩ 100 ℔ | 33 | @ | 40 |
| China Clay, English ₩ ton | 18.00 | @ | 18.00 |
| Cobalt Oxide, prep'd | 9.00 | @ | 11.00 |
| Cobalt Oxide, black, lots 100 ℔ | 1.90 | @ | .... |
| Cobalt Oxide, black, less 100 ℔ | 1.96 | @ | .... |
| Green, Paris, in bulk | 10 | @ | 10½ |
| Green, Paris, 170 @ 175 ℔ kegs | 10½ | @ | 11 |
| Green, Paris, small pack | 12 | @ | 17 |
| Green, Chrome, ordinary | 6 | @ | 12 |
| Green, Chrome, pure | 22 | @ | 25 |
| Lead, Eng., B.B. white | 8½ | @ | 10 |
| Lead, Amn. White, dry or in oil: | | | |
| Kegs, lots less than 500 ℔ | 7 | @ | 7¼ |
| Kegs, lots 500 ℔ to 5 tons | 6½ | @ | 6¾ |
| Kegs, lots 5 tons to 12 tons | 6¾ | @ | 6⅞ |
| Kegs, lots 12 tons and over | 6¼ | @ | 6½ |
| Lead, White, in oil, 25 ℔ tin pails, add to keg price | .. | @ | ⅛ |
| Lead, White, in oil, 12½ ℔ tin pails, add to keg price | .. | @ | 1 |
| Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price | .. | @ | 2¼ |
| Lead, Red, bbls. and ½ bbls | 6 | @ | 7 |
| Lead, Red, kegs | 6¼ | @ | 7¼ |
| Litharge, kegs | 6¼ | @ | 7¼ |
| Litharge, bbls. and ½ bbls | 6 | @ | 7 |

TERMS, &c.—Lead and Litharge.—On lots of 500 ℔ or over, 60 days' time or 2½ % discount for cash if paid within 15 days of date of invoice.

| | | | |
|---|---|---|---|
| Ocher, Rochelle | 1.35 | @ | 1½ |
| Ocher, French Washed | 1½ | @ | 2½ |
| Ocher, German Washed | 1½ | @ | 3 |
| Ocher, American | ½ | @ | 1½ |
| Orange Mineral, English | 8½ | @ | 9 |
| Orange Mineral, French | 10 | @ | 10½ |
| Orange Mineral, German | 8½ | @ | 9 |
| Orange Mineral, American | 8¼ | @ | 8¾ |
| Paris White, English Cliff-stone | 1.00 | @ | 1.15 |
| Paris White, American | 65 | @ | 75 |
| Red, Indian, English | 5½ | @ | 7 |
| Red, Indian, American | 2 | @ | 6½ |
| Red, Turkey | 9 | @ | 14 |
| Red, Tuscan | 9 | @ | 11 |
| Red, Venetian, American ₩ 100 ℔ | 1.00 | @ | 1.10 |
| Red, Venetian, English | 1.20 | @ | 1.35 |
| Sienna, Italian, Burnt and Powd. ₩ ℔ | 4 | @ | 5 |
| Sienna, Ital., Burnt Lumps | 1½ | @ | 3½ |
| Sienna, Ital., Raw, Powd | 4½ | @ | 5½ |
| Sienna, Ital., Raw, Lumps | 1¾ | @ | 3½ |
| Sienna, American, Raw | 1½ | @ | 1¾ |
| Sienna, American, Burnt and Powdered ₩ ℔ | 1½ | @ | 1¾ |
| Talc, French | .. | @ | 1¼ |
| Talc, American | 1¼ | @ | 1⅜ |
| Terra Alba, Fr'ch. ₩ 100 ℔ | 95 | @ | 1.25 |
| Terra Alba, English | 70 | @ | 80 |
| Terra Alba, American No. 1 | 65 | @ | 75 |
| Terra Alba, American No. 2 | 45 | @ | 50 |
| Umber, Turkey, Burnt and Powdered ₩ ℔ | 3½ | @ | 4 |
| Umber, Turkey Bnt. Ln | 2¾ | @ | 3 |
| Umber, Turkey, Raw and Powdered | 3¼ | @ | .... |
| Umber, Turkey, R'w Lumps | 2¼ | @ | 2¾ |
| Umber, Turkey, Bnt. Amer | 1¼ | @ | 1½ |
| Umber, Turkey, R'w Amer | 1¼ | @ | 1½ |
| Yellow, Chrome | 10 | @ | 25 |
| Vermilion, American Lead | 11¼ | @ | 12 |
| Vermilion, Quicks'er, bulk | 53 | @ | .. |
| Vermilion, Quicks'er, bags | 54 | @ | .. |
| Vermilion, Quicksilver sm'r pkgs | 62 | @ | .. |
| Vermilion, English Import | 85 | @ | 90 |
| Vermilion, Imitation, Eng | 8 | @ | 35 |
| Vermilion, Trieste | 90 | @ | 92½ |
| Vermilion, Chinese | 92½ | @ | 95 |
| Whiting Common, ₩ 100 ℔ | 37½ | @ | 42½ |
| Whiting Gilders' | 45 | @ | 55 |
| Zinc, American, dry ₩ ℔ | 3½ | @ | 4¼ |
| Zinc, French, Red Seal | 7½ | @ | .. |
| Zinc, Frech, Green Seal | 9 | @ | .. |
| Zinc, Frech, V. M. X | .. | @ | 7 |
| Zinc, Antwerp, Red Seal | 7¼ | @ | .. |
| Zinc, Antwerp, Green Seal | 7¾ | @ | .. |
| Zinc, German, L. Z. O | 6¾ | @ | 7¼ |
| Zinc, V. M. in Poppy Oil, G. Seal, lots of 1 ton and over | 10¾ | @ | 11½ |
| lots less than one ton | 11 | @ | 11½ |
| Zinc, V. M. in Poppy Oil, Red Seal | .. | @ | .. |
| lots of 1 ton and over | 10 | @ | 10½ |
| lots of less than 1 ton | 10¼ | @ | 10¾ |

DISCOUNTS.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1%; 25 bbls., 2%; 50 bbls. 4%. No discount allowed on less than bbl. lots.

## Colors in Oil—

| | | | |
|---|---|---|---|
| Black, Drop, Frankfort | 25 | @ | 30 |
| Black, Drop, English | 12 | @ | 15 |
| Black, Drop, Domestic | 7 | @ | 10 |
| Black, Lampblack, Best | 20 | @ | 35 |
| Black, Lampblack, Common | 7 | @ | 13 |
| Black, Ivory | 8 | @ | 15 |
| Blue, Chinese | 35 | @ | 40 |
| Blue, Prussian | 20 | @ | 45 |
| Blue, Ultramarine | 12 | @ | 18 |
| Brown, Vandyke | 7 | @ | 12 |
| Green, Chrome | 8 | @ | 13 |
| Green, Paris | 16 | @ | 18½ |
| Sienna, Raw | 7 | @ | 14 |
| Sienna, Burnt | 7 | @ | 14 |
| Umber, Raw | 7 | @ | 10 |
| Umber, Burnt | 7 | @ | 10 |

## Putty—

| | | | |
|---|---|---|---|
| In barrels and ½ bbls | .013½ | @ | .013¾ |
| In tubs | .015½ | @ | .013¾ |
| In tin cans | .01½ | @ | .02½ |
| In bladders | .01⅞ | @ | .02½ |

## Spirits Turpentine—

| | | | |
|---|---|---|---|
| In regular bbls | 30 | @ | 30¼ |
| In machine bbls | 30 | @ | 30½ |

## Glue—

| | | | |
|---|---|---|---|
| Low Grade ₩ ℔ | 8 | @ | 10 |
| Cabinet | 12 | @ | 14 |
| Medium White | 13 | @ | 15 |
| Extra White | 17 | @ | 20 |
| French | 10 | @ | 22 |
| English | 10 | @ | 15 |
| Irish | 12 | @ | .. |

# CURRENT METAL PRICES.

## NOVEMBER 29, 1893.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

### IRON AND STEEL—

#### Bar Iron from Store—

| | |
|---|---|
| Common Iron: | |
| ¾ to 2 in. round and square.. 1 to 6 in. x ⅜ to 1 in.... | ₩ lb 1.80 @ 1.90¢ |
| Refined Iron: | |
| ¾ to 2 in. round and square. 1 to 4 in. x ⅜ to 1½ in..... 4½ to 6 in. x ⅜ to 1 in. .... | ₩ lb 1.90 @ 2.00¢ |
| 1 to 6 in. x ¼ and 5-16..... | ₩ lb 2.10 @ 2.20¢ |
| Rods—⅝ and 11-16 round and sq. | ₩ lb 2.00 @ 2.10¢ |
| Bands—1 to 6 x 3-16 to No. 12.... | ₩ lb 2.20 @ 2.30¢ |
| "Burden Best" Iron, base price. | ₩ lb.... ...3.00¢ |
| Burden's "H. B. & S." Iron, base price..... ..... | ₩ lb.. .....2.80¢ |
| "Ulster"..... .... ..... | ₩ lb.....3.00¢ |
| Norway Bars..... ..... | 3.75 @ 4.00¢ |
| Norway Shapes... ..... | 4.50 @ 5.00¢ |

#### Merchant Steel from Store—

| | Per lb |
|---|---|
| Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots..... .. ..... | 2½¢ |
| Best Cast Steel, base price in small lots. | 8 ¢ |
| Best Cast Steel Machinery, base price in small lots ..... .. ..... | 5 ¢ |

#### Sheet Iron from Store—

Black—

Best Refined Iron.

| | |
|---|---|
| Nos. 14 to 20.....3 | @ 3⅛¢ |
| 21 to 24.....3¼ | @ 3⅜¢ |
| 25 to 26.....3⅜ | @ 3½¢ |
| 27.....3½ | @ 3⅝¢ |
| 28.....3⅝ | @ 3¾¢ |

Common ¼¢ less than the above.

Open Hearth Steel.

| | |
|---|---|
| Best Soft Steel, Nos. 14 to 16..... | 2½ @ 2⅝¢ |
| " " " 18 to 20..... | 2⅞ @ 3¢ |
| " " " 21 to 24..... | 3¼ @ 3¼¢ |
| " " " 25 to 26..... | 3⅜ @ 3⅜¢ |
| " " " 27 to 28... ..... | 3⅝ @ 3⅝¢ |

Best Bloom Sheets, ¼¢ extra over above prices.
Best Bloom, Galvanized, jobbing dis. 70 @ 70&5%
Ordinary Bessemer, ⅛¢ @ ¼¢ lower than above prices.

Russia, Planished, &c.

| | |
|---|---|
| Genuine Russia, according to assortment..... .... | ₩ lb 12¢ @ 13¢ |
| Patent Planished ..... | ₩ lb A, 10¢; B, 9¢, 5% |
| Craig Polished Sheet Steel..... | ₩ lb, 8½¢ |

#### Foreign Steel from Store—

| | |
|---|---|
| Best Cast..... | ₩ lb 15 ¢ |
| Extra Cast..... | ₩ lb 16½ @ 17 ¢ |
| Swaged, Cast..... | ₩ lb 16 ¢ |
| Best Double Shear ..... | ₩ lb 15 ¢ |
| Blister, 1st quality..... | ₩ lb 12 ¢ |
| German Steel, Best..... | ₩ lb 10 ¢ |
| 2d quality.... | ₩ lb 9 ¢ |
| 3d quality..... | ₩ lb 8 ¢ |
| Sheet Cast Steel, 1st quality..... | ₩ lb 15 ¢ |
| 2d quality..... | ₩ lb 14 ¢ |
| 3d quality..... | ₩ lb 12½¢ |
| R. Mushet's "Special"..... | ₩ lb 48 ¢ |
| " " Annealed..... | ₩ lb 75 ¢ |
| " " "Titanic" .... ... | ₩ lb 30 ¢ |
| Eicken's Special No. 8..... | ₩ lb 30 ¢ |
| " Extra..... | ₩ lb 15 ¢ |

### METALS—

#### Tin—

| | Per lb |
|---|---|
| Banca, Pigs ..... | 22¢ @ 22½¢ |
| Straits, Pigs..... | 21½¢ @ 22¢ |
| Straits in Bars..... | 22½¢ @ 23¢ |

#### Tin Plates—

Duty: 2.2¢ ₩ lb.

Charcoal Plates—Bright—

Guaranteed Plates command special prices, according to quality. Per box.

| | | | |
|---|---|---|---|
| Melyn and Calland Grade. | IC, 10 | x14.. | @ $6.50 |
| " " " | IC, 12 | x12.. | @ 6.75 |
| " " " | IC, 14 | x20.. | @ 6.50 |
| " " " | IC, 20 | x28.. | @ 13.00 |
| " " " | IX, 10 | x14.. | @ 8.50 |
| " " " | IX, 12 | x12.. | @ 8.75 |
| " " " | IX, 14 | x20.. | @ 8.50 |
| " " " | IX, 20 | x28.. | @ 17.00 |
| " " " | DC, 12½ | x17.. | @ 6.00 |
| " " " | DX 12½ | x17.. | @ 8.00 |
| Allaway Grade..... | IC, 10 | x14.. | @ 6.00 |
| " " ..... | IC, 12 | x12.. | @ 6.25 |
| " " ..... | IC, 14 | x20.. | @ 6.00 |
| " " ..... | IC, 20 | x28.. | @ 12.00 |
| " " ..... | IX, 10 | x14.. | @ 7.50 |
| " " ..... | IX, 12 | x12.. | @ 7.75 |
| " " ..... | IX, 14 | x20.. | @ 7.50 |
| " " ..... | IX, 20 | x28.. | @ 15.00 |
| " " ..... | DC, 12½ | x17.. | @ 5.50 |
| " " ..... | DX, 12½ | x17.. | @ 7.00 |

Coke Plates—Bright—

| | | | |
|---|---|---|---|
| Steel Coke.—IC, 10 x 14, 14 x 20.. | $5.40 | @ | $5.50 |
| 10 x 20.. .... | | @ | 8.50 |
| 20 x 28.. | 11.50 | @ | 12.00 |
| IX, 10 x 14, 14 x 20.. .... | | @ | 7.00 |
| BV Grade—IC, 10 x 14, 14 x 20.. .... | | @ | 5.50 |

Charcoal Plates—Terne—

Guaranteed Plates command special prices according to quality.

| | | |
|---|---|---|
| Dean Grade.—IC, 14 x 20..... .... | @ | $5.65 |
| 20 x 28..... . ... | @ | 11.00 |
| IX, 14 x 20..... .... | @ | 6.40 |
| 20 x 28..... .... | @ | 12.80 |
| Abecarne Grade.—IC, 14 x 20... .. | @ | 5.55 |
| 20 x 28.... .... | @ | 10 75 |
| IX 14 x 20.... .... | @ | 6 40 |
| 20 x 28.... .... | @ | 12.80 |

Tin Boiler Plates—

| | | |
|---|---|---|
| IXX, 14x 26.....112 sheets..... .... | @ | $13.35 |
| IXX, 14 x 28.....112 sheets..... .... | @ | 14.50 |
| IXX, 14 x 31.....112 sheets ..... .... | @ | 16.00 |

American Terne Plates.—Apollo.

| | |
|---|---|
| IC, 14 x 20..... | $6.25 |
| IC, 20 x 28..... | 12.50 |
| IX, 14 x 20 ..... | 7.25 |
| IX, 20 x 28 ..... | 14.50 |

#### Copper—

Duty: Pig, Bar and Ingot, 1¼¢; Old Copper, 1¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 35 % ad valorem.

Ingot—

| | |
|---|---|
| Lake..... | @ 11 ¢ |
| Ansonia grade Arizona..... | @ 10½¢ |
| Ansonia grade Casting..... | @ 10 ¢ |

Sheet and Bolt—

Prices adopted by the Association of Copper Manufacturers of the United States, May 19, 1892. Subject to a discount of 15 % @ 25 %, according to size of order. Stubs' gauge standard.

| Not wider than | Not longer than | And longer than | Weights per sq. foot and prices per pound. Over 64 oz. | 32 to 64 oz. | 16 to 32 oz. | 14 to 16 oz. | 12 to 14 oz. | 10 to 12 oz. | 8 to 10 oz. | Less than 8 oz. |
|---|---|---|---|---|---|---|---|---|---|---|
| 30 | 72 | | 22 | 22 | 22 | 23 | 24 | 25 | 28 | 30 |
| 30 | | 72 | 22 | 22 | 22 | 23 | 25 | 27 | 31 | .... |
| 36 | 96 | | 22 | 22 | 22 | 24 | 26 | 30 | 33 | .... |
| 36 | | 96 | 22 | 22 | 23 | 25 | 27 | 31 | 35 | ... |
| 48 | 96 | | 22 | 22 | 24 | 26 | 28 | 32 | .... | .... |
| 48 | | 96 | 22 | 22 | 25 | 27 | 29 | 33 | .. .. | .... |
| 60 | 96 | | 22 | 22 | 27 | 29 | 34 | .... | .... | .... |
| 60 | | 96 | 22 | 23 | 28 | .... | .... | .... | .... | .... |
| 84 | 96 | | 23 | 24 | .... | .. | .... | .... | .... | .... |
| 84 | | 96 | 24 | 25 | .... | .... | .... | .... | .... | .... |
| Ov'r 84 in. wide | | | 25 | 27 | .... | .... | .... | .... | .... | .... |

Bolt Copper, ⅜ inch diameter and over, ₩ lb 22¢
Circles, Segments and Pattern Sheets, 60 in. diameter and less, 3¢ ₩ lb advance over prices of Sheet Copper required to cut them from.
Circles, Segments and Pattern Sheets, over 60 in. diameter, up to 96 in. diameter inclusive, 4¢ ₩ lb advance over prices of Sheet Copper required to cut them from.
Circles, Segments and Pattern Sheets, over 96 in. diameter, 5¢ ₩ lb advance over prices of Sheet Copper required to cut them from.
Cold or Hard Rolled Copper 14 oz. ₩ square foot and heavier, 1¢ ₩ lb over the foregoing prices.
Cold or Hard Rolled Copper lighter than 14 oz ₩ square foot, 2¢ ₩ lb over the foregoing prices.
All Polished Copper over 20 in. wide, 2¢ ₩ lb advance over the foregoing prices.

Copper Bottoms, Pits and Flats—

| | Per lb. |
|---|---|
| 14 ounce to square foot and heavier..... | 26¢ |
| 12 ounce and up to 14 ounce to square foot... | 27¢ |
| 10 ounce and up to 12 ounce..... | 29¢ |
| Lighter than 10 ounce..... | 32¢ |

Circles less than 8 inches diameter, 2¢ ₩ lb additional.
Circles over 13 inches diameter are not classed as Copper Bottoms.
15 % @ 25 % discount, according to size of order.

Copper Wash Bowl Bottoms—

| | |
|---|---|
| Tinned..... | ₩ lb 34¢, 15% @ 25% |

#### Tinning—

Net.

| | |
|---|---|
| Tinning sheets on one side, 10, 12 and 14 x 48 each ..... | 8¢ |
| Tinning sheets on one side, 30 x 60 each..... | 30¢ |
| For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each ..... | 15¢ |
| For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each..... | 12¢ |
| For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.), each..... | 12¢ |
| Tinning sheets on one side, other sizes, per square foot..... | 2½¢ |
| For tinning both sides double the above prices. | |

Planished Brass and Copper—

Not larger than 30 x 60.

| | |
|---|---|
| 16 oz. and heavier. .... . ..... | 24¢ ₩ lb |
| 14 oz..... | 25¢ ₩ lb |
| 12 oz. ..... | 27¢ ₩ lb |

#### Seamless Brass Tubes—

Standard always Stubs' gauge, unless otherwise ordered.

July 6, 1892. Net.

| O. G. | N. G. | ⅜ | ½ | ⅝ | ¾ | ⅞ | 1 | 1¼ |
|---|---|---|---|---|---|---|---|---|
| 8-14 | 6-12 | 32 | 28 | 25 | 24 | 23 | 22 | 19 |
| 15 | 13 | 33 | 28 | 26 | 25 | 24 | 23 | 20 |
| 16 | 14 | 34 | 29 | 27 | 26 | 25 | 24 | 20 |
| 17 | 15 | 35 | 30 | 28 | 27 | 26 | 25 | 21 |
| 18 | 16 | 37 | 31 | 29 | 27 | 26 | 25 | 22 |
| 19 | 17 | 38 | 32 | 30 | 29 | 28 | 27 | 24 |
| 20 | 18-19 | 39 | 34 | 32 | 31 | 30 | 29 | 26 |
| 21 | 20 | 41 | 36 | 34 | 33 | 32 | 31 | 29 |
| 22 | 21 | 43 | 37 | 35 | 34 | 33 | 32 | 31 |
| 23 | 22 | 45 | 39 | 37 | 36 | 35 | 34 | 34 |
| 24 | 23 | 48 | 41 | 39 | 38 | 36 | 35 | 36 |
| 25 | 24 | 51 | 44 | 41 | 40 | 39 | 38 | 40 |

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional

*Brazed Brass Tubing.* (To No. 20 inclusive.)

Brown & Sharpe's gauge standard.

| | |
|---|---|
| Above 5-16 inch to 3 inch, inclusive..... | 35¢ |
| Plain, above 3 inch..... | 45¢ |
| Plain, 5-16 inch..... | 45¢ |
| Plain, ¼ inch..... | 60¢ |
| Plain, 3-16 inch ..... | $1.00 |
| Plain, ⅛ inch..... | $1.50 |
| Fancy Tubing, Brass, to No. 20, inclusive..... | 43¢ ₩ lb |
| Bronze Tubing, 3¢ ₩ lb more than Brass. | |
| Discount from list..... | 30 @ ..% |

#### Roll and Sheet Brass—

*(Brown & Sharpe Standard Gauge.)*

| Common High Brass: Wider than and including | in. 2 / 10 | in. 10 / 12 | in. 12 / 14 | in. 14 / 16 | in. 16 / 18 | in. 18 / 20 | in. 20 / 22 | in. 22 / 24 |
|---|---|---|---|---|---|---|---|---|
| To No. 20 -inclusive . | .21 | .23 | .23 | .25 | .27 | .29 | .31 | .33 |
| Nos. 21, 22, 23 and 24. | .22 | .23 | .24 | .26 | .28 | .30 | .32 | .34 |
| Nos. 25 and 26..... | .22½ | .23½ | .24½ | .27 | .29 | .31 | .33 | .35 |
| Nos. 27 and 28..... | .23 | .24 | .2 | .28 | .30 | .32 | .34 | .36 |
| Common High Brass: Wider than and including | in. 24 / 26 | in. 26 / 28 | in. 28 / 30 | in. 30 / 32 | in. 32 / 34 | in. 34 / 36 | in. 36 / 38 | in. 38 / 40 |
| To No. 20, inclusive.. | .36 | .39 | .42 | .46 | .50 | .55 | .60 | .65 |
| Nos. 21, 22, 23 and 24. | .37 | .40 | .43 | .47 | .51 | .56 | .61 | .68 |
| Nos. 25 and 26..... | .38 | .41 | .44 | .48 | .52 | .57 | .63 | .71 |
| Nos. 27 and 28..... | .39 | .42 | .45 | .49 | .53 | .58 | .65 | .75 |

Discount from List 15 % to 25 %.

#### Brass and Copper Wire—

List January 17, 1884.

| Numbered by Stubs' gauge. | Soft & hard high brass. | Spring high brass. | Low brass. | Copper. |
|---|---|---|---|---|
| All Nos. to No. 16, inclusive..... | $0.22 | $0.24 | $0.26 | $0.30 |
| No. 17 and No. 18 ..... | .23 | .25 | .27 | .31 |
| No. 19 and No. 20..... | .24 | .26 | .28 | .32 |
| No. 21, or 0.032 diameter | .25 | .27 | .29 | .33 |

Discount 15 % to 25 %.

*Fine Numbers.*

| Numbered by London gauge. | Brass. | Spring high brass. | Low brass. | Copper. |
|---|---|---|---|---|
| No. 22..... | $0.26 | $0.28 | $0.30 | $0.34 |
| No. 23..... | .28 | .30 | .32 | .36 |
| No. 24..... | .30 | .32 | .34 | .38 |
| No. 25..... | .32 | .34 | .36 | .40 |
| No. 26..... | .35 | .37 | .39 | .43 |
| No. 27..... | .38 | .40 | .42 | .46 |
| No. 28..... | .42 | .44 | .46 | .51 |
| No. 29..... | .45 | .47 | .49 | .54 |
| No. 30..... | .48 | .50 | .52 | .62 |
| No. 31..... | .51 | .53 | .55 | .67 |
| No. 32..... | .55 | .57 | .59 | .73 |
| No. 33..... | .59 | .61 | .63 | .82 |
| No. 34..... | .64 | .66 | .68 | .95 |
| No. 35..... | .70 | .72 | .74 | 1.30 |
| No. 36..... | .76 | .78 | .80 | 1.50 |
| No. 37..... .... | 1.00 | 1.02 | 1.04 | 1.70 |
| No. 38..... ..... | 1 30 | 1.32 | 1.34 | 2 00 |
| No 39..... | 2.00 | 2.02 | 2.00 | 3.25 |
| No. 40.... ..... | 2.60 | 2.62 | 2.60 | 5.75 |

— % discount.
Spring Wire, 2¢ ₩ lb advance.

#### Copper Belt and Hose Rivets and Burrs—

| | Per lb. | | Per lb. |
|---|---|---|---|
| No. 5..... | 49¢ | No. 11..... | 56¢ |
| No. 6..... | 49¢ | No. 12..... | 58¢ |
| No. 7..... | 49¢ | No. 13..... | 60¢ |
| No. 8..... | 50¢ | No. 14..... | 65¢ |
| No. 9..... | 52¢ | No. 15..... | 70¢ |
| No. 10..... | 54¢ | | |

60 % @ 5 % discount.

#### Tobin Bronze—Rods.

*Drawn Rods for Bolts, Forgings, &c.*

| | |
|---|---|
| ¼ to 3½ inches inclusive..... | 17¢ ₩ lb |
| Over 3½ to 5 inches inclusive..... | 18¢ ₩ lb |

*Piston Rods, Finished True, Smooth and Straight.*

| | |
|---|---|
| ¼ to 3½ inches inclusive... ..... | 18¢ ₩ lb |
| Over 3½ to 5 inches inclusive ..... | 19¢ ₩ lb |

#### Spelter—

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb

| | |
|---|---|
| Western Spelter..... ..... | 4½¢@4¾¢ |
| Bertha (pure)..... ..... | 8¢@8¼¢ |

#### Zinc—

Duty: Sheet, 2½¢ ₩ lb.

| | |
|---|---|
| 600 lb casks..... .. ..... ... | 5½¢@5¾¢ |
| Per lb..... ... | 6½¢ |

#### Lead—

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 2½¢ ₩ lb.

| | |
|---|---|
| American Pig..... ..... | 4¢@4.10 |
| Bar..... | 4½¢ |
| Pipe, subject to discount 20%..... ..... | 6¼¢ |
| Tin-Lined Pipe, subject to discount 20%... | 15¢ |
| Block Tin Pipe, subject to discount 20%..... | 37½¢ |
| Sheet, subject to discount 20%..... ... | 7¢ |

Old Lead in exchange, 3½¢ ₩ lb.

#### Solder—

| | |
|---|---|
| ½ @ ½ ..... ..... | 13½¢ @ 14½¢ |
| No. 1..... | 11¾¢ @ 12½¢ |

Prices of Solder indicated by private brands vary according to composition.

#### Antimony—

| | |
|---|---|
| Cookson... ... ..... | ₩ lb 11 ¢ |
| Hallett's .. ..... ... | 10½¢ |

#### Aluminum—

Duty: 15¢ ₩ lb.

| | |
|---|---|
| No. 2 grade metal, in to a lots..... | ₩ lb .75 |
| No. 1 (guaranteed to be 98 % pure and over), in ton lots..... | ₩ lb .90 |
| Lots less than 1 ton..... | 10¢ ₩ lb additional |

#### Old Metals—

*Prices Paid in New York.*

| | | |
|---|---|---|
| Heavy Copper..... | ₩ lb | 7½¢ |
| Light and Tinned Copper..... | ₩ lb | 6½¢ |
| Heavy Brass..... | ₩ lb | 5½¢ |
| Light Brass..... | ₩ lb | 4½¢ |
| Lead..... | ₩ lb | 3 ¢ |
| Tea Lead..... | ₩ lb | 2 ¢ |
| Zinc..... | ₩ lb | 2¾¢ |
| No. 1 Pewter..... | ₩ lb | 14 ¢ |
| No. 2 Pewter..... | ₩ lb | 7 ¢ |
| Wrought Scrap Iron..... | ₩ gross ton | $9.00 |
| Heavy Cast Scrap..... | ₩ gross ton | 7.00 |
| Stove Plate Scrap..... | ₩ gross ton | 4.50 |
| Burnt Iron..... | ₩ gross ton | 3.00 |