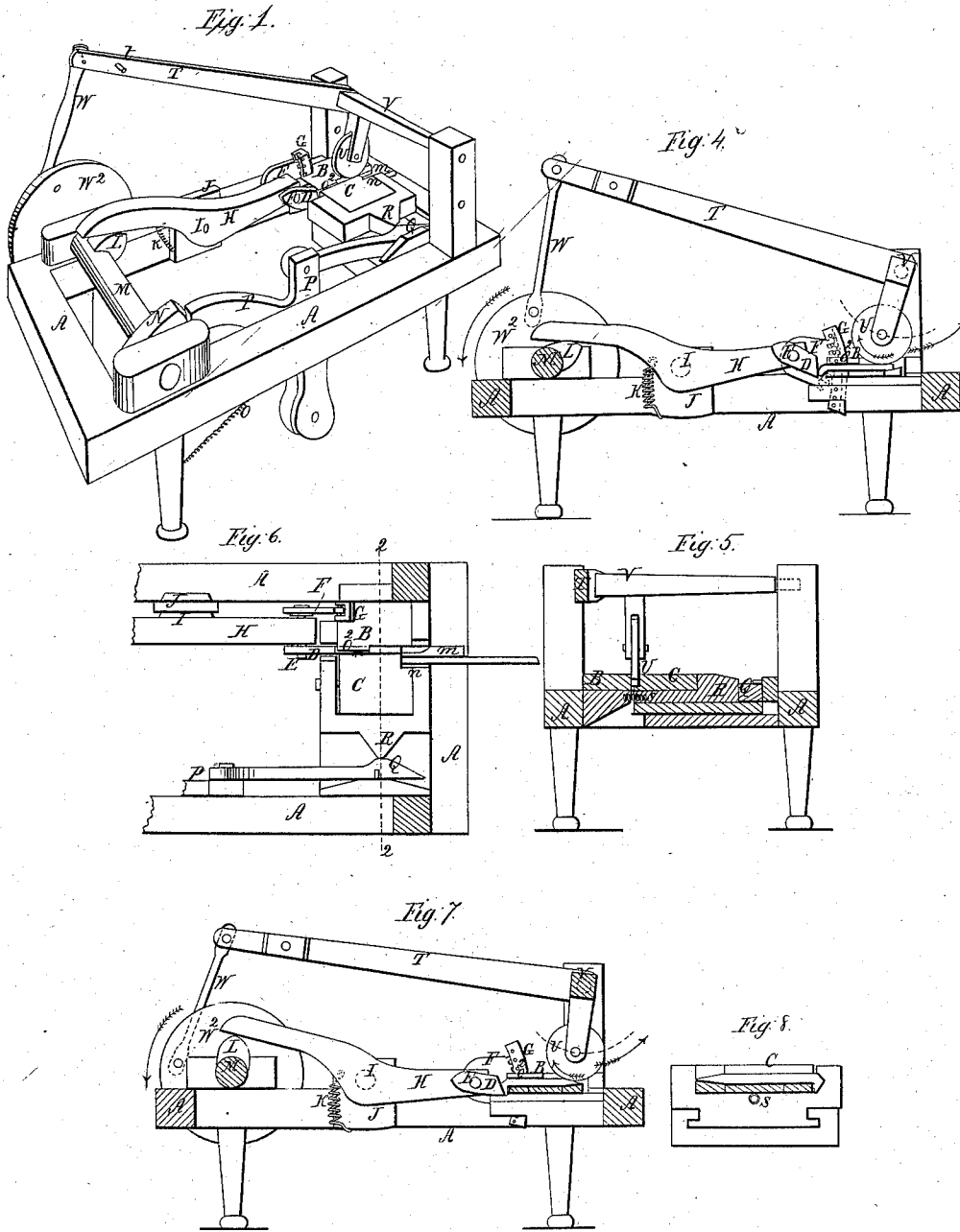


*M. Hardaway*

*Making Spikes.*

*N<sup>o</sup> 508.*

*Patented Jul. 16, 1850.*



# UNITED STATES PATENT OFFICE.

MOORE HARDAWAY, OF TROY, NEW YORK.

## SPIKE-MACHINE.

Specification of Letters Patent No. 7,508, dated July 16, 1850.

*To all whom it may concern:*

Be it known that I, MOORE HARDAWAY, of the city of Troy, in the county of Rensselaer and State of New York, have invented a new and useful Machine for Making Hook-Headed and other Wrought-Iron Spikes, the construction of which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.

Figure 1, is a perspective view of the machine. Fig. 4, is a vertical longitudinal section through the center of the dies,—the dies being in the position of commencing the heading and pointing the spike. Fig. 5, is a transverse section of ditto, on line 2, 2, of Fig. 6. Fig. 6, is a horizontal section showing the position of the dies immediately after the spike is cut from the rod, and before it is headed or pointed. Fig. 7, is a vertical section,—showing the bottom die: also the header and pointer in the position of finishing the pointing and heading the spike. Fig. 8, is a view of the inner edge of the movable die,—showing the bottom die thereof, and bed-plate over which said slide die moves in grooves.

Similar letters refer to corresponding parts on the several figures.

The nature of my invention and improvement consists in a new and useful combination and arrangement of mechanical devices, and mode of operating the same,—by which the spike is cut from the heated rod, gripped and held firmly between horizontal dies—bent down at one end—and hook-headed and rolled out longitudinally at the other end,—and pointed between an inclined stationary—and a rolling die,—the several operations being performed almost simultaneously and at every revolution of a cam shaft, operated by steam or other power,—by which hook spikes of a superior character are produced.

A is a frame for containing and supporting the several parts of the machine to make the spike.

B is a stationary side die.

C is a sliding and cutting die, for cutting off the spike from the rod and holding it while being headed and pointed.

D is the header, for heading the spike.

E is a shaft, projecting horizontally from said header, through the end of a vibrating lever, and a cogged segment F that works into a stationary rack G fixed to the frame,

for turning the heading die D after it has bent the end of the spike over the edge of the die for upsetting and shaping the head by which operation the too sudden bending of the iron and consequently fracturing of the same is prevented.

H is a vibrating lever to which the heading die D is connected by the shaft E.

I is the fulcrum bolt or pin on which the lever vibrates said bolt passing through the fixed post or block J fastened to the frame.

K is the spring for drawing down the long arm of the lever, after heading the spike.

L is a revolving cam on the cam shaft M, for raising the long arm of the lever to head the spike—by the action of the cogged segment F.

N is a cam on the same cam shaft for operating the jointed arm P to move the wedge or incline plane Q against a swelling or protuberance on the back of the carriage containing the sliding side die C.

O is the spring for drawing back the jointed arm to allow the slide die, to recede from the stationary die, which is effected by means of a spring S placed between the dies in any convenient position.

P is the jointed arm containing the inclined plane Q aforesaid for moving the slide die.

R is the protuberance on the carriage against which the incline plane Q, acts during the operation of cutting off the spike.

T is a bent lever containing a roller U, for pointing the spike simultaneously with heading the same—its fulcrum being seen at V—and a connecting rod W for operating the lever, being attached to its outer extremity, and to a wrist or pin inserted into the side of the wheel W<sup>2</sup> on the cam axle M, near the periphery.

The pointing roller U, for pointing the spike, is of the same width as the intended spike.

The shaft E is fixed permanently to the header D, and cogged segment F, and turns loosely in the lever H, so that when the lever is vibrated the cogged segment F, matching into the rack G, causes the header to turn so as to change the angle of its face with the side of the die and to bend it down over the bottom die in a proper position to form the head without fracturing or injuring the iron and then to press

the iron longitudinally against the die into the form of the required head.

The bottom or bed portion of the movable die is composed of three parts—namely, the rectangular steel portion, against which the head is formed, the inclined steel portion upon which the point is formed, and the middle portion which is made of cast iron, as indicated in Fig. 8.

*m* is a fixed cutter, placed upon the frame in such a position in relation to the dies, as to cut the required length from the heated bar to form the spike, upon the approach of the sliding die.

*n* is a recess formed in the corner of the sliding die adjacent to the cutter for the purpose of receiving the end of the continuous bar, and cutter, after the separation, and closing of the die as seen in Fig. 6.

The stationary die B, is provided with a lip or projection (*o*<sup>2</sup>) to prevent the spike rising by the action of the header to form and furnish the head.

Operation: The machine being put in motion by any adequate power, the spike rod, in a heated state, is passed into the machine between the side dies, and upon the bed portion of the sliding die. The sliding side die cuts off the spike and conveys it over and against the stationary side die, where it is gripped and held firmly. The header then strikes upon the top of that portion of the spike projecting over the steel die intended to form the head, and bends it down obliquely and regularly and then by the compound motion of the header produced by its peculiar arrangement presses the iron longitudinally against the steel die into the form of a hook headed spike and at the same time, that this operation is going on, the pointing roller or die, which is of the same width as the required spike, is caused to sweep the arc of a circle scribed from the journaled shaft V, and to rotate on its axis, and elongate the iron and point the same upon the inclined steel die, which forms the underside of the point of the spike. The slide die is then moved back by the spring S with the spike thus pointed and headed resting upon the horizontal por-

tion of the sliding side die, the spike rod is again brought forward against the finished spike which it removes from the die, and takes its place. The operation of cutting, heading and pointing is then repeated.

It will be seen that the rod from which the spike is to be made is not brought against the end, or face of the header, as is usual, but is allowed to pass it a certain distance, when the header is brought to act or bear upon it with a force sufficient to bend it on one side, when the header is caused to have a longitudinal, or parallel motion and completes the head.

Having thus described the construction and operation of my improved machine for cutting, heading and pointing hook headed spikes from heated rods, or bars of iron, by successive operations, what I claim as my invention and improvement and desire to secure by Letters Patent is,—

The method of imparting to the header D, a compound motion for first bending the end of the spike downward, and then moving it forward against the die to form the hook end, simultaneously with the operation of rolling the opposite end to the form of a wedge, with a roller of the same width of periphery, as the thickness of the spike, the said header being fixed to the end of a turning shaft E passed through the lever H and inserted into a segment cogged or toothed plate F made to match into a fixed segment rack G by which the angle of the header is changed to correspond with the required form of the head of the spike, as the lever H is vibrated by the motion of the cam shaft M, and the roller U being moved in the arc of a circle as it rotates on its own axis, by being attached to the short arm of the bent lever T, whose long arm is attached to a wrist of the wheel or plate W<sup>2</sup> on the cam shaft M as herein fully set forth. In testimony whereof I have hereunto signed my name before two subscribing witnesses.

MOORE HARDAWAY.

Witnesses:

J. F. WELLS,  
JAMES W. FLAERK.