No. 612,897. Patented Oct. 25, 1898.

B. F. ELLIS.

CONSTRUCTION OF TUBES AND CYLINDERS.

(Application filed Dec. 7, 1896.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

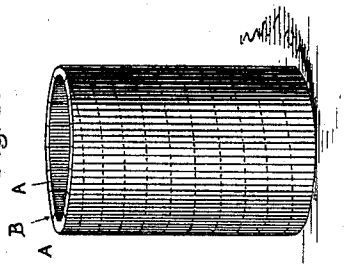
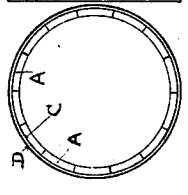


Fig. 2.

Fig. 3.



Witnesses:

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M. Regnier

Inventor:

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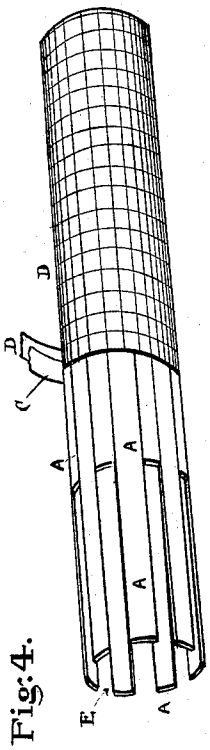

Fig. 4.

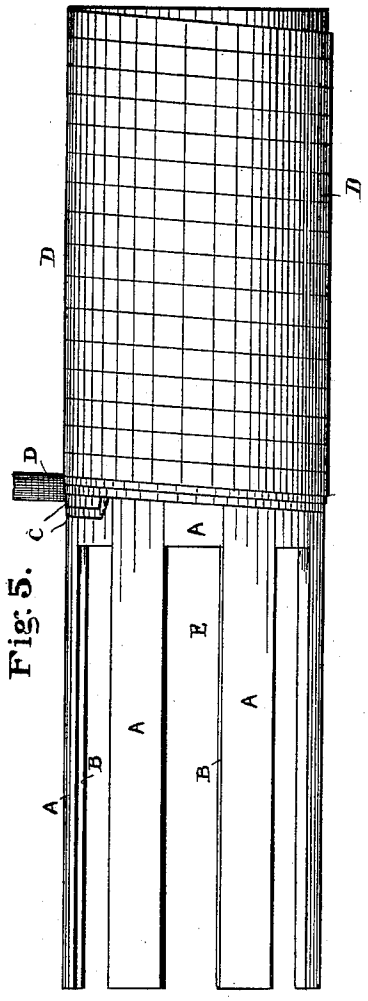

Fig. 5.

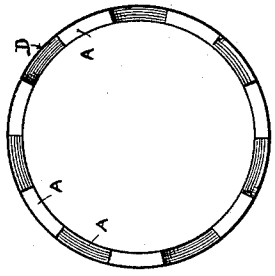

Fig. 6.

Witnesses:

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UNITED STATES PATENT OFFICE.

BENJAMIN F. ELLIS, OF BERKELEY, CALIFORNIA.

CONSTRUCTION OF TUBES AND CYLINDERS.

SPECIFICATION forming part of Letters Patent No. 612,897, dated October 25, 1898.

Application filed December 7, 1896. Serial No. 614,786. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN F. ELLIS, a citizen of the United States, residing at Berkeley, in the county of Alameda and State of California, have invented certain new and useful Improvements in Composite Tubes and Cylinders, of which the following is a specification.

The present invention relates to a certain new and useful composite tube or cylinder for use as a conductor for fluids or for use as packages for the holding and transportation of various articles; and it consists in the arrangement of parts and details of construction, as will be hereinafter fully set forth and described in the specification.

In carrying out my invention the tube or cylinder is constructed with an inner wall or lining composed of a series of parallel wooden staves, laths, or strips placed side by side, so that their sides or edges meet, bound together by a backing of paper or fibrous material coated with hot asphaltum by being run through a bath thereof, the bound wooden cylinder being reinforced or strengthened by one or more layers of spirally-wound veneer ribbon composed of wood lined or backed with paper or cloth, which veneer ribbon is first passed through a hot solution of asphaltum. The backing for the wooden cylinder and the veneer ribbon I pass through heated asphaltum in order that the same may adhere firmly together, so as to form a homogeneous mass and a waterproof outer wall or covering. The sides or edges of each stave, lath, or wooden strip are beveled, so that the edges of each stave, lath, or strip may come together as the cylinder is formed.

In order to fully comprehend my invention, reference must be had to the accompanying sheet of drawings, wherein—

Figure 1 is a perspective view of a finished tube or cylinder embodying my invention and removed from the mandrel. Fig. 2 is a side view enlarged, showing the manner of breaking joints of the staves and the manner of applying the veneer with paper backing. Fig. 3 is a cross-section of the tube or cylinder unfinished. Fig. 4 is a reduced view in perspective, showing the manner of forming the tube with strips of paper alone. Fig. 5 is an enlarged view showing the manner of overlapping the strips or ribbons of paper. Fig. 6 is a cross-section of the same.

In the manufacture of the tubes or cylinders I employ a suitable former or mandrel, upon which the staves A for forming the wooden cylinder are placed. These staves are placed parallel, and the edge B of each is beveled, so that as the staves are placed together a close joint is formed between the edges, the pitch or angle of the bevel being greater or less in accordance to the diameter of the cylinder to be formed.

Prior to placing the staves upon the mandrel the same are passed through compression-rolls in order to compress the fiber of the wood as much as possible to provide against shrinkage thereof after being formed into a cylinder.

The staves as placed upon or around the mandrel or former are held in place and secured together by means of the backing C, which is composed of paper or suitable pliable material. This backing before being wound upon the staves is passed through a solution of hot asphaltum, which causes the backing to adhere firmly to the surface of the staves. Over this backing is spirally wound one or more layers of what I term a "veneer ribbon" D, which is composed of strips of wood of suitable thickness and width for bending, provided with a paper or flexible backing of corresponding width. The veneer ribbon prior to being wound upon the backing C is passed through a solution of hot asphaltum, which not only serves to firmly unite the parts but to make the outer coating of the wooden cylinder perfectly waterproof. As spirally wound upon the backing C the edge of each succeeding spiral of the veneer ribbon abuts against the preceding one, but does not overlap the same. Consequently a smooth exterior surface is given to the tube or cylinder.

In order that a pipe, tube, or cylinder of indefinite length may be formed, I commence building the wooden tube or cylinder with staves, laths, or strips so cut that every alternate one will project beyond the preceding one, thus forming the spaces or broken joints E at one end of the completed cylinder. Into these spaces is fitted each alternate stave, lath, or strip composing the added section of the pipe or tube, the completed section of the

cylinder being slipped back upon the mandrel or former upon which it is built as the length thereof is added to or increased. The pipe, tube, or cylinder thus formed may be cut into shorter tubes, pipes, or cylinders for use as vessels or packages for any required material. After the pipe or cylinder is finished the inner surface thereof may be coated with any suitable waterproof material.

I am aware that pipes or tubes have been made with an inner wooden lining or wall composed of staves bound together by wrapping coated with asphaltum, and I do not wish to be understood as claiming this broadly.

By the use of the term "asphaltum" in this application I do not wish to be understood as limiting myself to the particular article of commerce known by that name, the term being herein made use of to designate as well other analogous substances capable of performing the function for which the asphaltum is used.

Having thus described my invention, what I claim as new, and desire to secure protection in by Letters Patent, is—

1. As a new article of manufacture, a pipe, tube or cylinder, comprising an inner wall composed of a series of longitudinal staves or strips placed side by side, a flexible backing fabric treated with asphaltum around said strips or staves, and a reinforcing and strengthening ribbon of wood veneer backed by a flexible fabric wound helically around said backing.

2. As a new article of manufacture, a pipe, tube or cylinder, comprising an inner wall composed of a series of longitudinal staves or strips placed side by side, a flexible fabric coated with asphaltum around said strips or staves, and a ribbon wound helically around said flexible fabric composed of a strip of wood veneer backed by a flexible fabric and coated with asphaltum.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

BENJAMIN F. ELLIS. [L. S.]

Witnesses:
C. W. M. SMITH,
CHAS. E. KELLY.