

No. 624,144.

Patented May 2, 1899.

F. A. WILMOT.
METAL TUBE.

(Application filed Jan. 27, 1899.)

(No Model.)

Fig. 1.

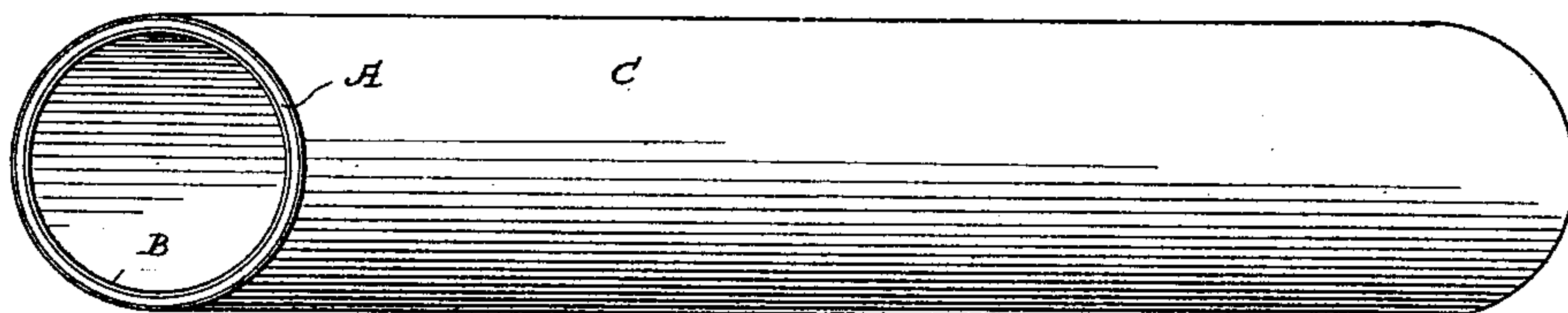


Fig. 5.

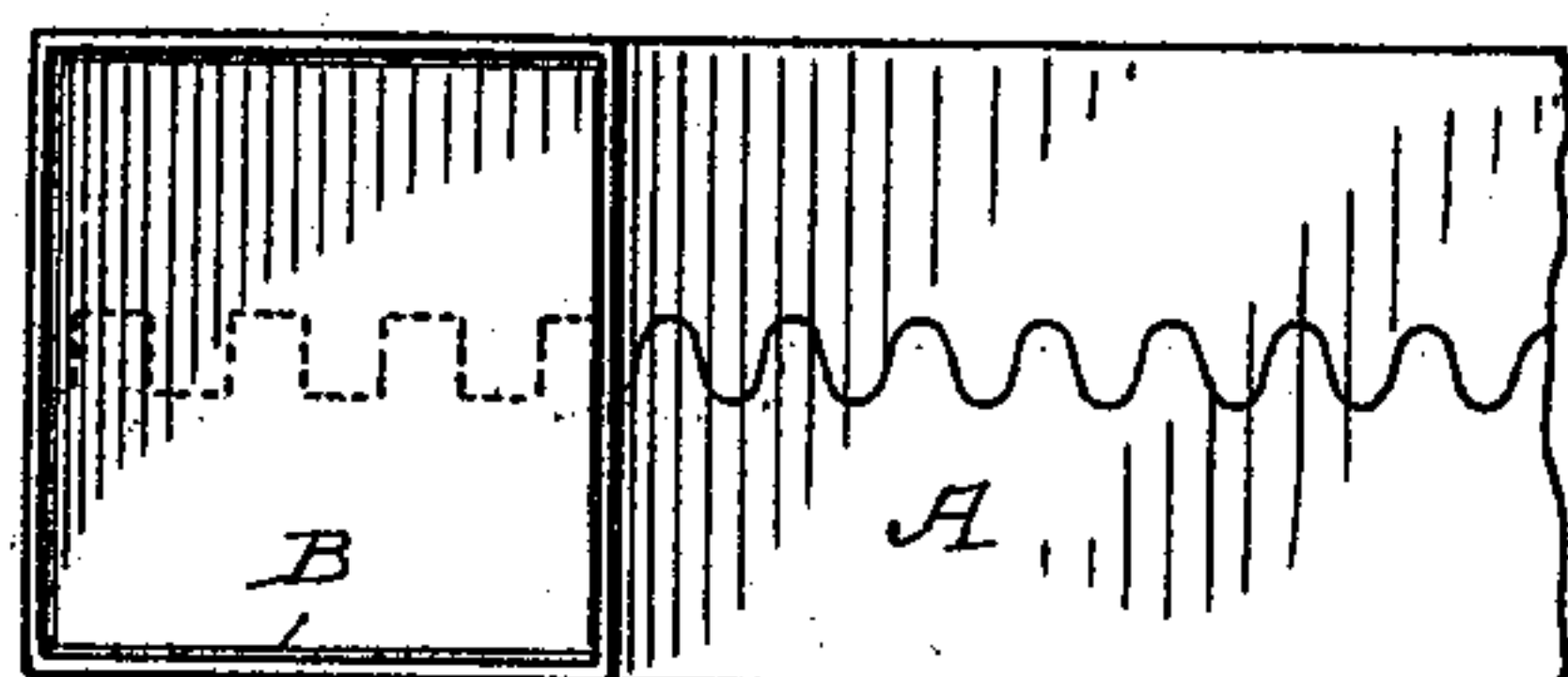


Fig. 6.

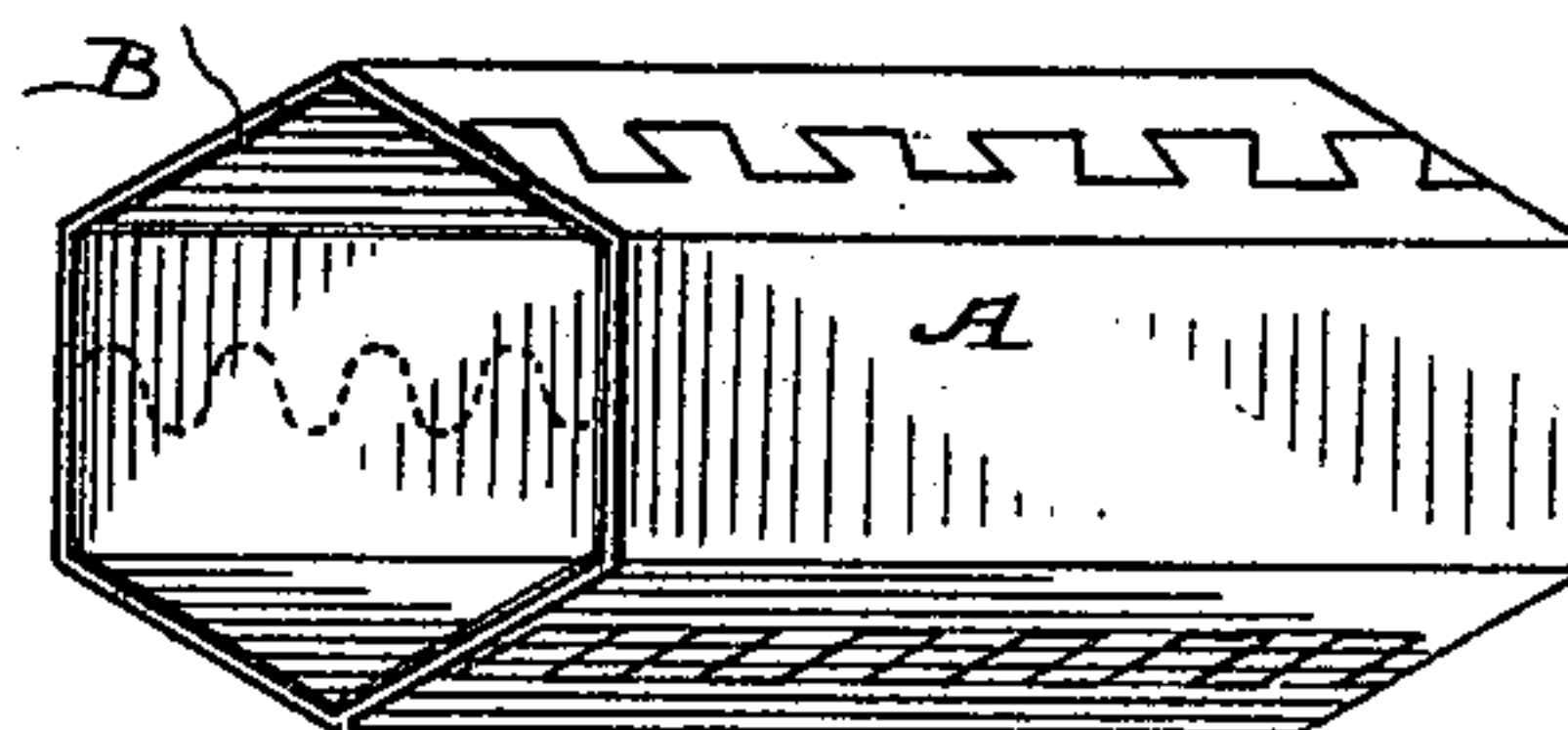


Fig. 2.

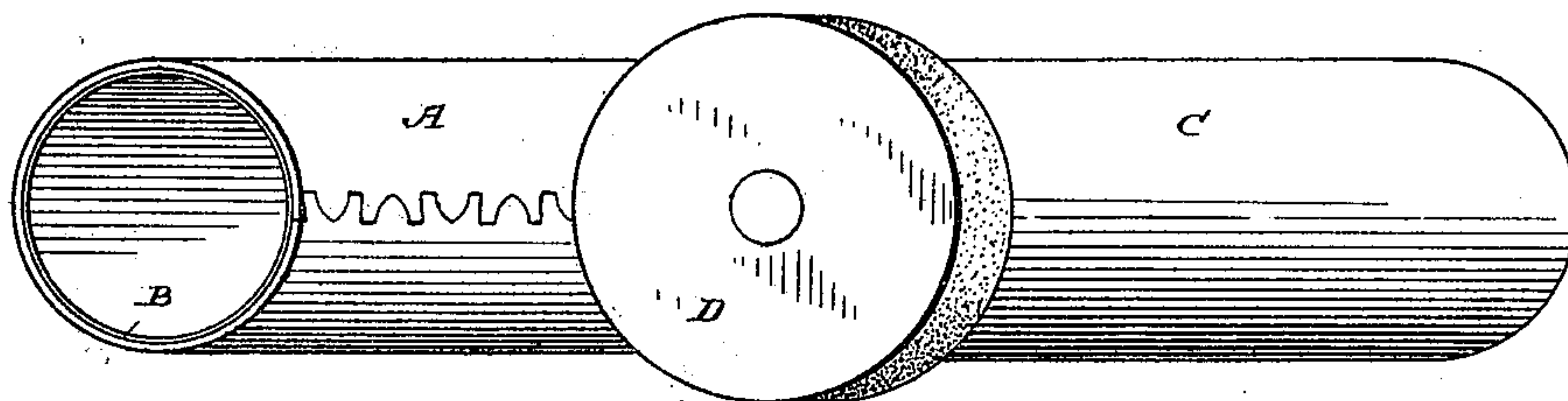
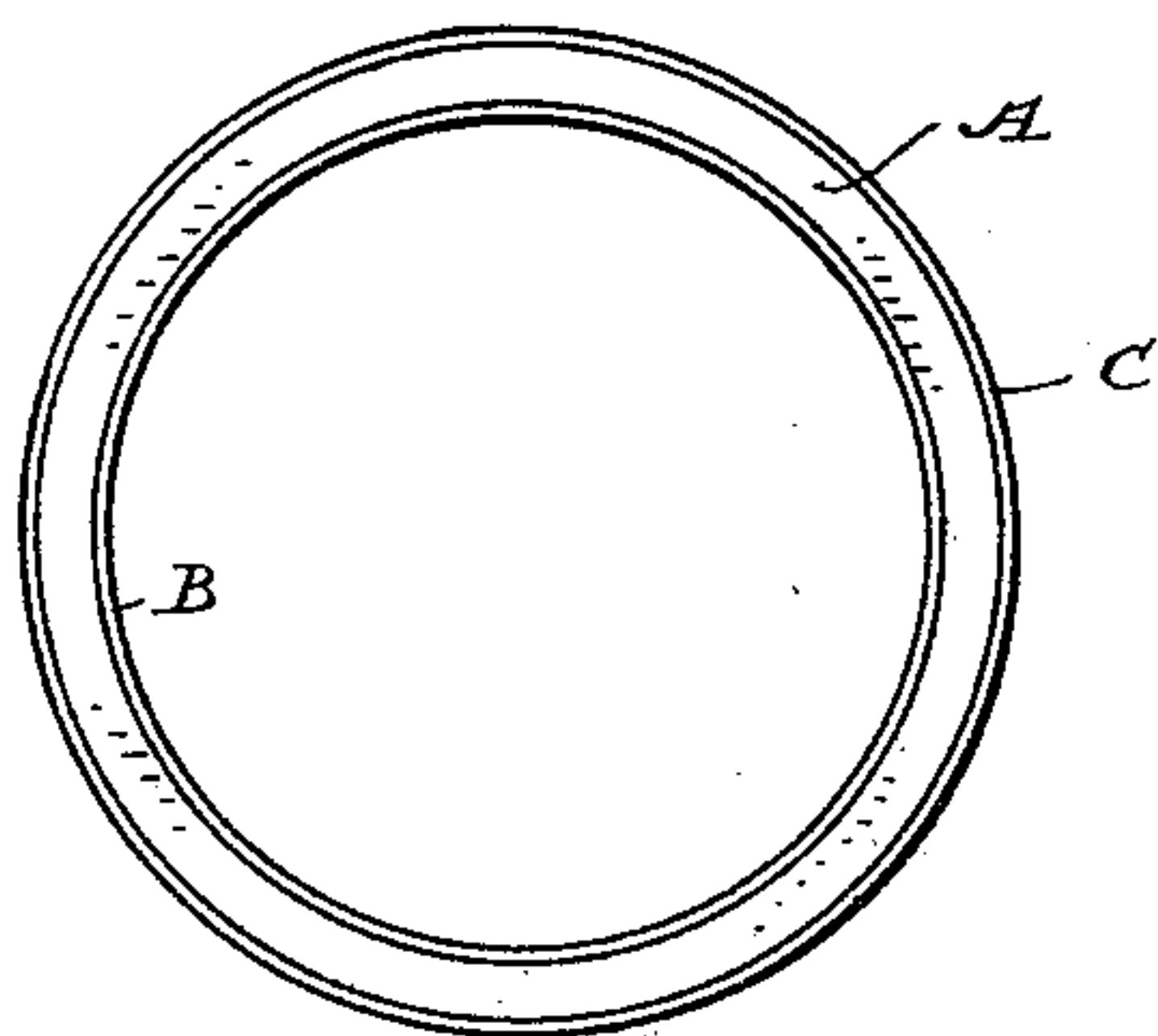


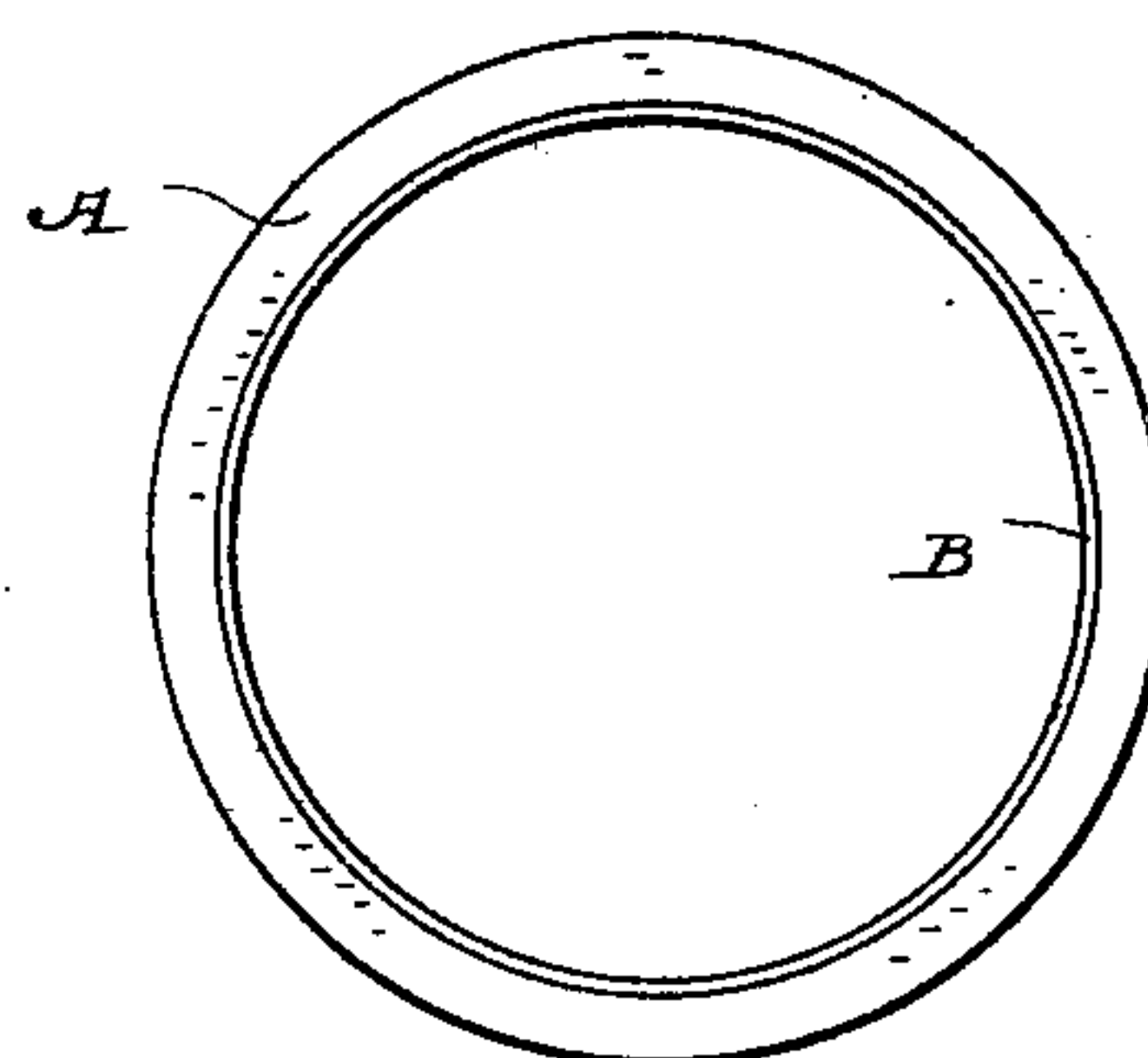
Fig. 3.



WITNESSES

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Fig. 4.



INVENTOR

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UNITED STATES PATENT OFFICE.

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METAL TUBE.

SPECIFICATION forming part of Letters Patent No. 624,144, dated May 2, 1899.

Application filed January 27, 1899. Serial No. 703,590. (No model.)

To all whom it may concern:

Be it known that I, FRANK A. WILMOT, a citizen of the United States, residing at Bridgeport, county of Fairfield, State of Connecticut, have invented a new and useful Metal Tube, (Case B,) of which the following is a specification.

My invention relates to metal tubing adapted for general use, and especially adapted for use in the manufacture of bicycle-frames, bayonet-scabbards, and other articles formed from iron or steel tubing, it not being essential, so far as the principle of my invention is concerned, that the tubing be produced in any special manner—as, for example, in carrying out my invention the tubing may be ordinary drawn tubing or jointed tubing of any ordinary grade, or it may be tubing of the kind known to the trade as “clencher” tubing—that is, tubing formed from a strip of sheet metal having upon its edges interlocking projections and recesses, said edges being closed together by circumferential compression, so that in certain of the teeth metal is displaced laterally in alternate opposite directions, causing the teeth on the opposite edges to clench firmly, as fully set forth and claimed in Letters Patent Nos. 578,799, 578,800, and 578,801, granted to me March 16, 1897; and my present invention has for its object to produce a tube of this character which shall be moisture-proof from the inside, water-tight at the joint, which will take the solder readily in brazing flush joints, and which will take an enamel upon its outer side and hold it so that blistering shall be prevented.

In the accompanying drawings, forming part of this specification, Figure 1 is a perspective illustrating my novel tubing in the process of manufacture, the tube having been dipped and being covered interiorly and exteriorly with a coating of non-oxidizable metal; Fig. 2, a similar view illustrating the operation of grinding off the outer coating; Fig. 3, an end view, on an enlarged scale, illustrating the tube as in Fig. 1—that is, after being dipped or otherwise coated interiorly and exteriorly with non-oxidizable metal; Fig. 4, a similar view illustrating the completed tube—that is to say, the outer coating of non-oxidizable metal having been

ground off in order to finish the tube and the joint, the joint, in fact, being barely visible in the tubing as finished for shipment or use; and Figs. 5 and 6 are perspectives illustrating the principle of my invention as applied in connection with flat-sided tubing and illustrating different well-known styles of interlocking joints and also showing tubes made from a plurality of pieces or strips of metal—that is, having a plurality of joints.

It is of course well understood that in the manufacture of bicycle-frames it is found practically impossible in assembling the parts to prevent moisture from getting into the tubes. It has been a serious objection to all classes of tubing heretofore used in the manufacture of bicycle-frames that moisture within the tubes would cause oxidation of the tubes from the inner side, frequently causing the enamel to blister and flake off and sometimes completely destroying the integrity of the tubing, so that the bicycle became liable to break in use, with serious results to the rider. This objection I wholly overcome by dipping the tubes, without any polishing or finishing whatever, in a suitable molten non-oxidizable metal or alloy—for example, brass—whereby a coating of the non-oxidizable metal is formed both on the interior and exterior of the tubes. Other important advantages which result from dipping the tubes in molten non-oxidizable metal or alloy are that the interstices of the joint are completely filled with the molten metal, which solders the joint in the most effective manner possible and makes the tubes for all practical purposes solid tubes. Another advantage is that the inner coating of non-oxidizable metal makes a perfect preparation without any additional operations for brazing flush joints, as in putting the parts of a bicycle-frame together, and another very important advantage is that the cost of final grinding of the tube is found to be greatly reduced by the coating of non-oxidizable metal, which is ground off in the manner that a tube is ordinarily ground for the purpose of polishing; but it is found in practice that when coated with another metal a very fine finish may be produced upon the tubes by grinding much more easily and quickly than if the tubes are ground without dipping in molten metal.

A denotes the tube, which may be of iron or steel and may be a drawn tube or a jointed tube of any style, although I preferably use in making my novel tubing steel tubes of the well-known "clencher" type—that is, tubes formed from blanks or strips of sheet metal having upon their edges interlocking projections and recesses, said edges being closed together by circumferential compression, so that in certain of the teeth metal is displaced laterally in alternate opposite directions, causing the teeth on the opposite edges to clench firmly. It will of course be apparent that the tubes may be formed from a plurality of pieces or strips of metal and of any desired form in cross-section. B denotes an inner coating of any suitable non-oxidizable metal or alloy, which comprises part of the finished tubing, and C an outer coating of the same metal, which is placed upon the tube simultaneously with the inner coating, preferably by dipping the entire tube in molten metal or alloy, but which is wholly ground off in the final process of polishing and finishing the tube for shipment or use, it being of course understood that tubing of this character after being manufactured into articles, as bicycles, is ordinarily finished exteriorly by japanning of the quality commonly known as "enameling" and that this finish requires that the iron or steel tubes upon which it is placed should be thoroughly cleaned and polished. The grinding or polishing of the tubes may be effected in any preferred manner, as by a grinding-wheel D.

It is to be understood that owing to the fact that the tube is butt-jointed in the sense that its edges do not overlap each other, but abut against each other, and that the joint is flushed with the non-oxidizable metal or alloy by being dipped therein the subsequent grinding of the outer surface leaves said joint absolutely imperceptible.

Having thus described my invention, I claim—

1. The method of finishing metal tubing which consists in coating the tubes both interiorly and exteriorly with a non-oxidizable metal or alloy and then grinding off the coating from the exterior of the tubes, substantially as and for the purposes set forth.

2. The method of finishing sheet-metal tubing which consists in dipping the tubes in molten non-oxidizable metal or alloy whereby a non-oxidizable metallic coating is formed interiorly and exteriorly of the tubes and then finishing the tubes by grinding off the coating from the exterior thereof.

3. The method of making and finishing sheet-metal tubing which consists in providing each edge of a blank of sheet metal with a series of interlocking projections and recesses, then closing said edges together, then dipping the tube in molten non-oxidizable metal or alloy whereby the interstices of the joint are filled and the edges are soldered tightly together and then finishing the tube by grinding off the coating from the exterior thereof.

4. The method of making and finishing sheet-metal tubing which consists in providing each edge of a blank of sheet metal with a series of interlocking projections and recesses, then closing said edges together by circumferential compression so that metal of certain of the teeth is displaced laterally in alternate opposite directions then dipping the tube in molten non-oxidizable metal or alloy whereby the interstices of the joint are filled and the edges are soldered tightly together and then finishing the tube by grinding off the coating from the exterior thereof.

5. As a new manufacture, a butt-jointed iron or steel tube dipped in a non-oxidizable metal or alloy and having its outer surface ground smooth.

6. A tube formed from a blank of sheet metal having upon its edges interlocking projections and recesses, the edges of said blank being closed together and forming a butt-joint, the said tube being dipped in a non-oxidizable metal or alloy, and the interstices of the joint thus filled with said metal or alloy whereby the edges are soldered and the tube made integral, said tube having its exterior ground smooth.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK A. WILMOT.

Witnesses:

A. M. WOOSTER,
S. V. HELEY.