No. 715,570. Patented Dec. 9, 1902.

P. H. FRIEL.

DIE FOR COVERING TUBES.

(Application filed June 6, 1902.)

(No Model.) 2 Sheets—Sheet 1.

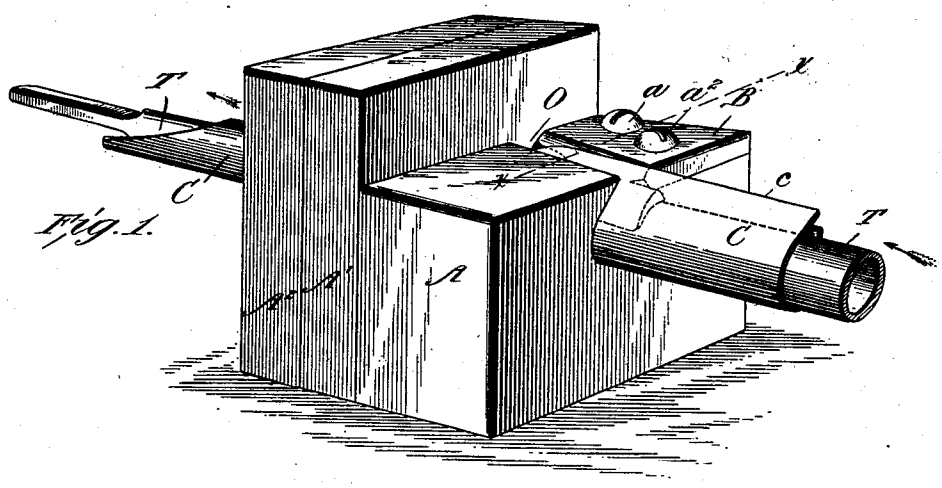


Fig. 1.

Fig. 3.

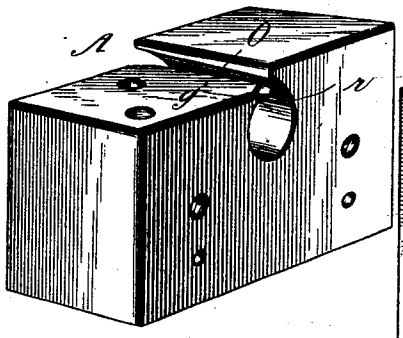


Fig. 4.

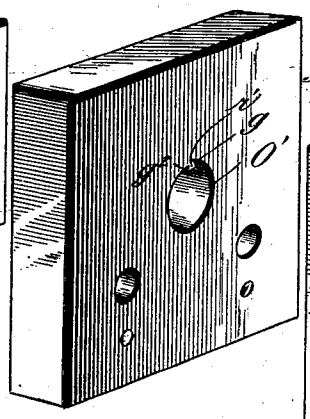


Fig. 5.

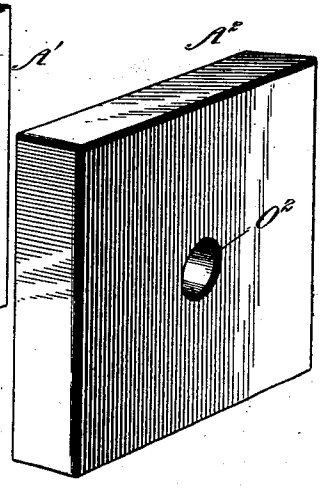


Fig. 2.

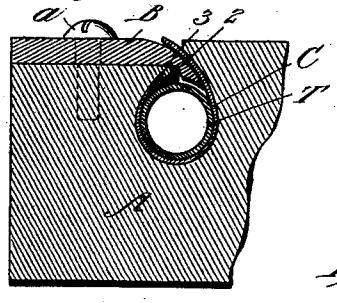


Fig. 6.

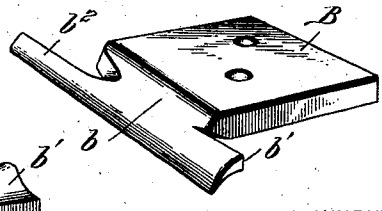
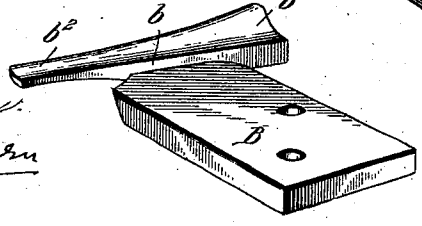


Fig. 7.



WITNESSES:

Geo. P. Kingsbury.

Edw. W. Byrn

INVENTOR

Patrick H. Friel.

BY Munn & Co.

ATTORNEYS.

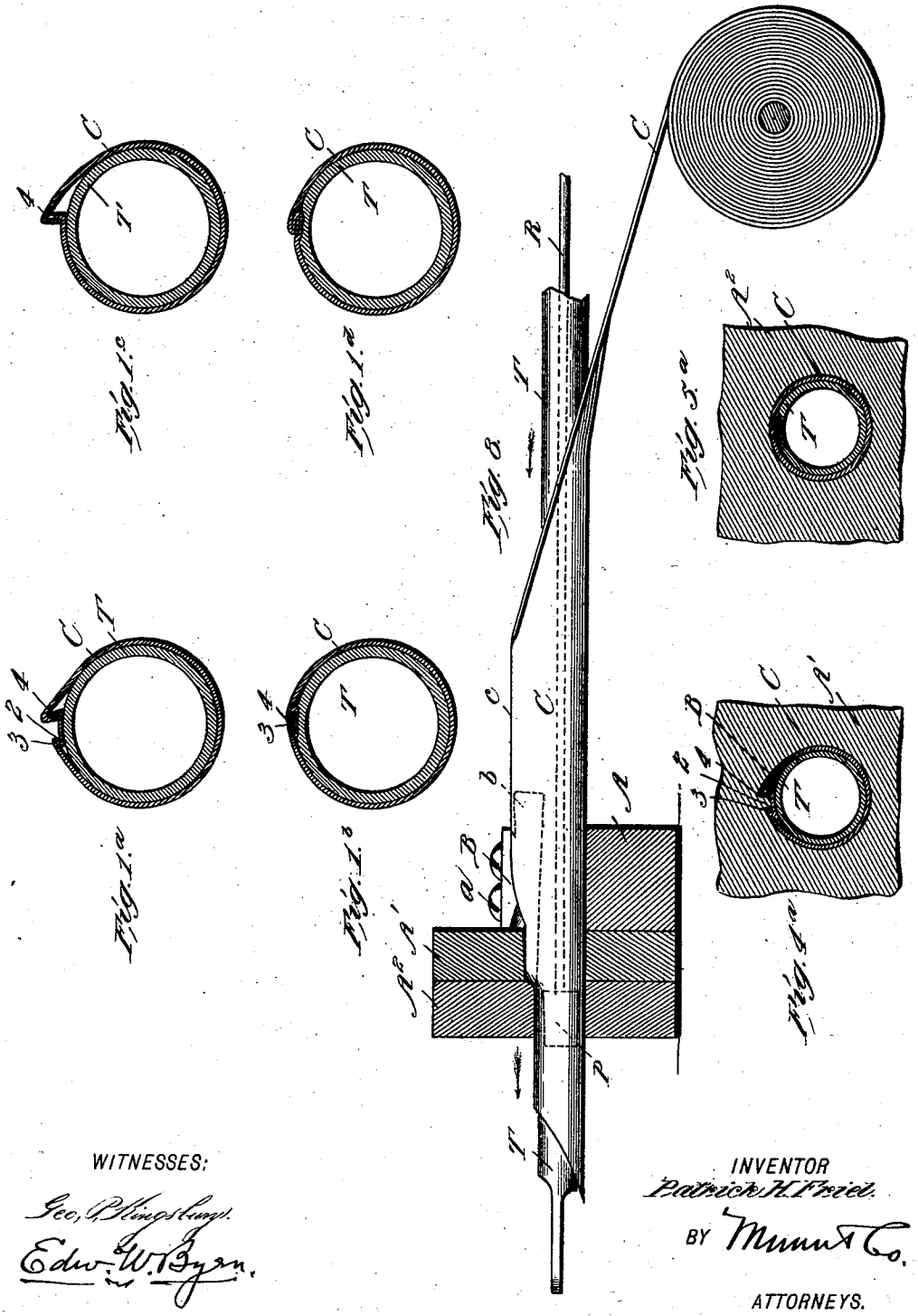
No. 715,570. Patented Dec. 9, 1902.

P. H. FRIEL.

DIE FOR COVERING TUBES.

(Application filed June 6, 1902.)

(No Model.) 2 Sheets—Sheet 2.



WITNESSES:

Geo. C. Kingsbury.

Edw. W. Byrn.

INVENTOR

Patrick H. Friel.

BY Munn & Co.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

PATRICK HENRY FRIEL, OF KENOSHA, WISCONSIN.

DIE FOR COVERING TUBES.

SPECIFICATION forming part of Letters Patent No. 715,570, dated December 9, 1902.

Application filed June 6, 1902. Serial No. 110,471. (No model.)

To all whom it may concern:

Be it known that I, PATRICK HENRY FRIEL, of Kenosha, in the county of Kenosha and State of Wisconsin, have invented a new and useful Improvement in Dies for Covering Tubes, of which the following is a specification.

The object of my invention is to provide a simple, cheap, practical, and efficient die for covering a metal tube with a casing or outer jacket of brass or other metal. It is an improvement upon my former patent, No. 696,865, dated April 1, 1902; and it consists in a die of such construction as forms a double lock-joint with flush parallel edges, which makes a stronger and a more nearly invisible joint than the single lock-joint heretofore made on my die as already patented. My new construction follows and includes the old construction, but adds certain other configurations to the parts of the die to produce the new result, and it will therefore be necessary to first describe accurately the old die as already patented and then point out the added features of the present improvement.

Figure 1 is a perspective view of the die with a portion of the tube and its covering in position. Figs. 1^a and 1^b show my new form of double lock-joint, Fig. 1^a showing it in process of formation and Fig. 1^b showing the joint complete. Figs. 1^c and 1^d are similar views of my old form of single lock-joint as made by my machine already patented, Fig. 1^c illustrating the seam in process of formation and Fig. 1^d showing it completed. Fig. 2 is a cross-section on line $x\ x$ of Fig. 1. Figs. 3, 4, and 5 are detached views of portions of the die. Fig. 4^a is a sectional view taken through the block A′, and Fig. 5^a is a similar view taken through block A^2. Fig. 6 is a top view, and Fig. 7 a bottom side view, of the folder; and Fig. 8 is a longitudinal section through the die.

Referring now to Fig. 1^c and Fig. 1^d, it will be seen that the old single lock-joint simply hooks one edge of the brass casing into the other edge, as in Fig. 1^c, and then flattens them down, as in Fig. 1^d.

In my new double lock (see Figs. 1^a and 1^b) this same interlocking of the hooked edges is employed on one side, as seen at 4; but the other side of the brass sheet is formed into a depression or groove 2 and a ridge 3, and when the part 4 is mashed down, as in Fig. 1^b, the part 3 is flattened down and overlapped upon the part 2, forming two bends and three thicknesses of metal on this side, which bring the two sides of the joint practically flush, making a practically invisible and stronger joint. I will now describe the die by which this result is obtained.

In the drawings, A A′ A^2 represent the three parts of the die, which are in the nature of steel blocks held together, as shown in Fig. 1. The block A is of less height than A′ and A^2 and is also somewhat thicker. Along the upper surface of block A is formed a transverse opening O, which opens along its length through the upper surface of the block and has a tapering throat at the left-hand side in Fig. 3, which is the point where the tube and sheet-metal ribbon first enter the die. On one side of this opening the surface of this die-block is higher than it is on the other side. On the lower surface there is held a detachable folder-plate B by means of a set-screw a and set-screw a^2, which latter passes through the folder-plate and entering a hole in the subjacent die-block prevents the folder-plate from turning about the set-screw a and holds said plate in true position. In the die-block A′ the hole O′ has along one side a V-shaped notch or groove g through the same, as seen in Fig. 4, which groove opens laterally into the central hole, while the opening O^2 in block A^2 is circular, as shown in Fig. 5.

The openings O O′ O^2 when the blocks are brought together, as in Fig. 1, are in coincidence with each other and give passage to the tube T and the metal strip C, which is to form an external jacket around the tube. This jacket is formed from a ribbon of sheet metal, which is fed from a spool or reel, as in Fig. 8, and which is formed around and firmly joined about the tube by pulling the tube T and the sheet-metal ribbon through the die, as indicated by the arrows in Figs. 1 and 8.

The former B has a shank portion b, with a short right-angular extension b' on one side and a longer right-angular extension b^2 on the other side. When this former is in position, as shown in Figs. 1, 2, and 8, the short ex-

tension b' is on the outer or entering side of the die and the longer extension b^2 is on the inner side and extends into the V-shaped groove g of block A′ and through the same. The extensions b' b^2 are convex on the outside and concave on the inside, the concave surface corresponding in cross-section to the cross-sectional curve of the tube. The extensions b' b^2 constantly taper to a diminishing cross-section from b' to b^2. The function of this folder is to gradually fold or curl the outer edge c of the ribbon over the other edge. The first curling action is effected in the block A around the large end of former B, as seen in Fig. 2. Then as the tube and its covering pass into the block A′ over the smaller extension b^2 of the former the curled edge is folded around the other edge, as seen in Fig. 4^a, and thence it passes into the die-block A^2, as seen in Fig. 5^a, where the folded parts are mashed down flat to produce a locked joint in which the edges are so compressed as to be scarcely noticeable.

To form an inner bearing for the tube T as it is drawn through block A^2, a steel plug P (shown in dotted lines in Fig. 8) is held stationary inside the tube by means of a rod R.

As so far described the construction and operation of the die is precisely the same as shown in my previous patent, and I will now point out the novel construction of my die by which the double joint shown in Figs. 1^a and 1^b is formed. In the inner periphery of the die-block A and underneath the former-plate I form a V-shaped groove g', which forms between it and the edge of the slot a dovetail rib r, extending parallel with the alined holes of the die-blocks, and a corresponding alined rib r' is formed in the die-block A′ by V-shaped grooves g^2 and g. These dovetail ribs r and r' form the depression 2 of Fig. 1^a in the brass ribbon, and when the tube and its casing are pulled through the round hole of the die-block A^2 the shoulders 3 and 4 are flattened down to form flush abutting edges and a double lock-joint, as seen in Fig. 1^b.

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

1. A die-block for covering round metal surfaces with an external jacket having a throat formed on its inner periphery with two parallel grooves making a dovetail rib, combined with a former lying in one of said grooves substantially as and for the purpose described.

2. A die for covering round metal surfaces with an external jacket, consisting of a block having a hole through the same opening on the upper surface of said block and a dovetail rib along said opening, a higher block having an opening through it with two V-shaped notches in its side forming a dovetail rib lying in line with the dovetail rib of the first block, and a folder attached to the upper surface of the lower block and having two extensions, one extending outwardly and the other one extending inwardly into one of the V-shaped notches of the higher block substantially as and for the purpose described.

3. The die for covering round metal surfaces with an external jacket, consisting of a block having a hole through the same opening on the upper surface of said block and a dovetail rib lying inside said hole and parallel with the opening on the upper surface, another block having an opening through it with two V-shaped grooves g, g^2 forming a dovetail rib in alinement with the dovetail rib of the other block, a folder attached to the upper surface of the first block and having two extensions, one extending outwardly and the other inwardly into one of the V-shaped notches of the inner block, and a third die-block having a plain round hole disposed behind the other blocks and adapted to flatten down the double locked edges of the metal ribbon substantially as described.

PATRICK HENRY FRIEL.

Witnesses:
GROFTON L. CAMERON,
C. N. GONNERMANN.