(No Model.)

# W. PHILLIPS.

## DIE FOR INCASING METAL TUBES.

No. 550,724. Patented Dec. 3, 1895.

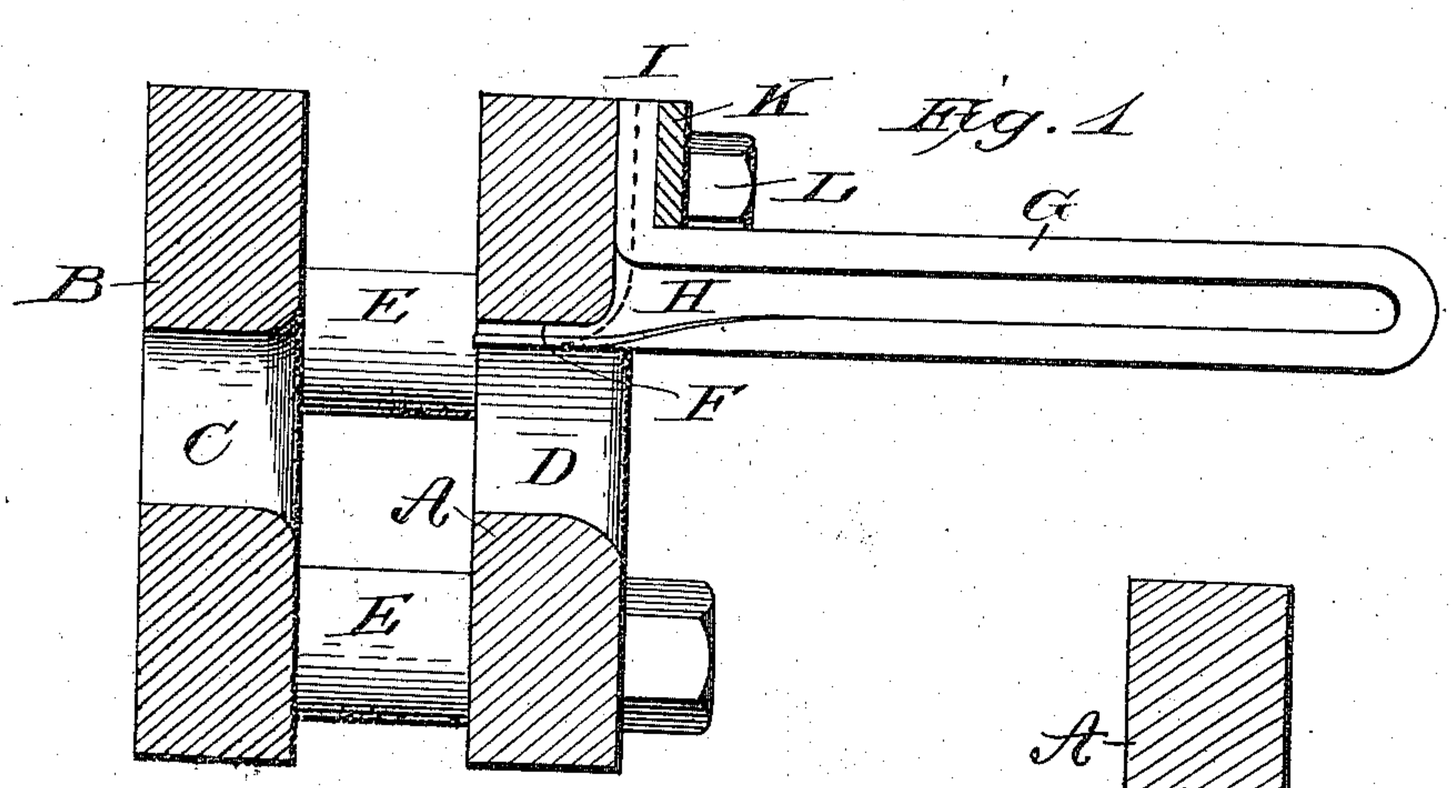



Fig. 1.

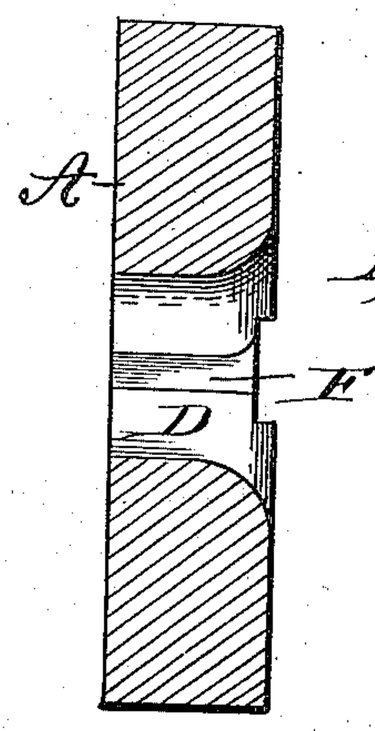



Fig. 2.

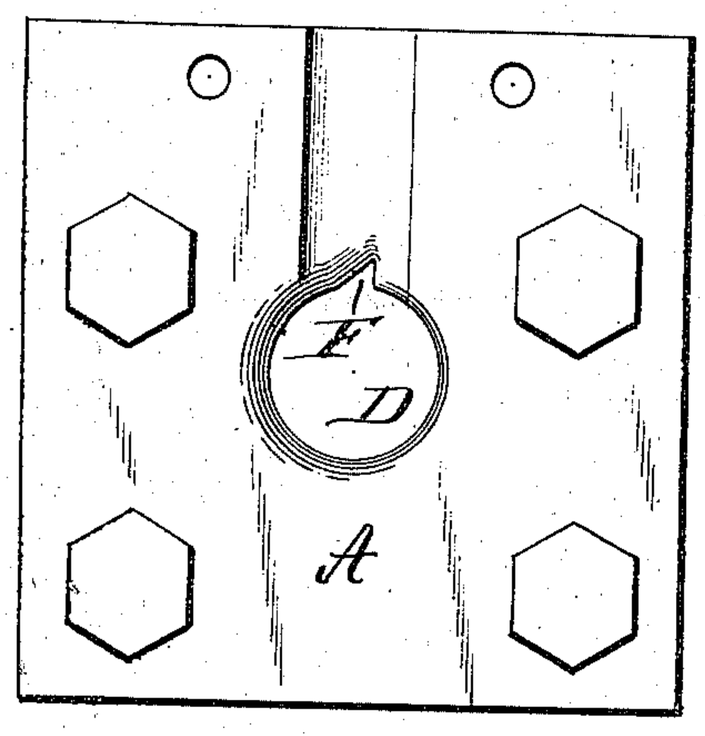



Fig. 3.

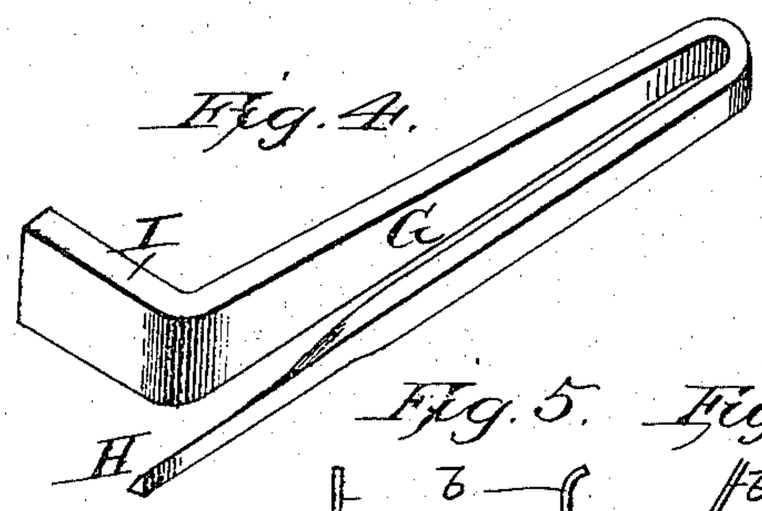
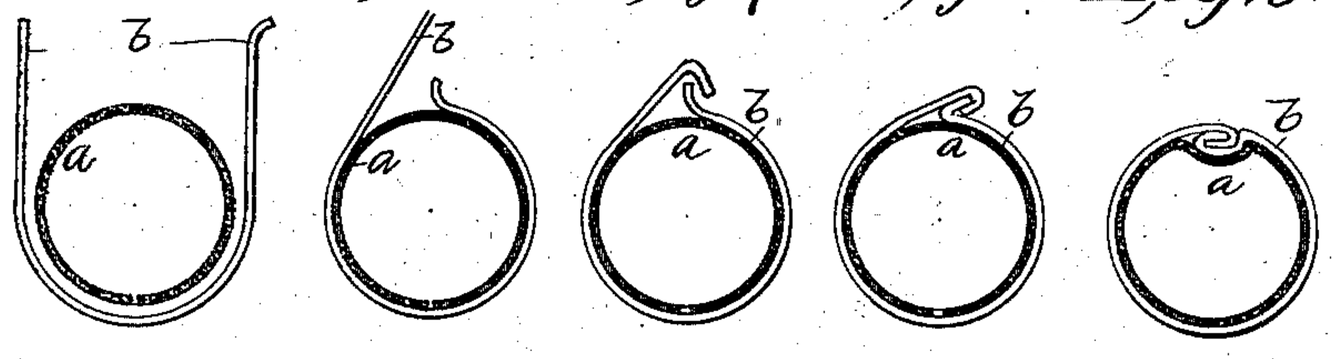



Fig. 4.

Fig. 5. Fig. 6. Fig. 7. Fig. 8. Fig. 9.




WITNESSES
F. L. Ourand.
Jos. Gregory

INVENTOR
William Phillips
By Dewey & Fowler
Attorneys

# UNITED STATES PATENT OFFICE.

WILLIAM PHILLIPS, OF WATERBURY, CONNECTICUT, ASSIGNOR TO THE WATERBURY BRASS COMPANY, OF SAME PLACE.

## DIE FOR INCASING METAL TUBES.

SPECIFICATION forming part of Letters Patent No. 550,724, dated December 3, 1895.

Application filed August 20, 1894. Serial No. 520,808. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM PHILLIPS, a subject of the Queen of Great Britain, and a resident of Waterbury, in the county of New Haven and State of Connecticut, have invented new and useful Improvements in Dies for Incasing Metal Tubes; and I do hereby declare the following to be a full, clear, and exact description of said invention, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to an improved combination-die for incasing metal tubes or pipes with a sheet-metal covering, whereby said covering may be readily bent around the tube and its edges overlapped and flattened, making a lock-joint, and the material of the lining-tube depressed to form a seat for said joint.

The invention consists in the novel construction and combination of parts hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 is a central longitudinal section of a combination-die constructed in accordance with my invention. Fig. 2 is a longitudinal section of the first die, showing the groove therein, the seam-former being removed. Fig. 3 is a front view of the same. Fig. 4 is a perspective view of the seam-former removed. Figs. 5, 6, 7, 8, and 9 are cross-sections of the tube and its cover, showing the different steps in the process of making the same.

In the said drawings the reference-letters A and B designate two rectangular plates, each provided with an aperture C and D, with flaring mouths, forming dies or draw-plates. These plates are connected together by means of bolts E. The second die, B, is somewhat smaller than die A, and the said die A is formed with a horizontal groove F, one side of which is tapering, as seen in Fig. 3. Located in this die is the free end of a seam-former consisting of a steel bar G, which is beveled at H or on the side opposite the beveled side of the groove. This former consists of a steel bar bent over upon itself near the center and one end bent upwardly, as seen in Fig. 1, forming an arm I, which is seated in a rectangular groove or recess in the upper side of the plate A and is held in place by a bracket K, having a similar groove or recess, and secured to the said plate by means of bolts L. By loosening these bolts the said former may be adjusted vertically.

The operation is as follows: The said die-plates may be secured to any suitable bench or drawing-machine and the former adjusted so as to be at the proper distance from the beveled groove in the die-plate. A tube *a* is then formed by any suitable machine into an approximately circular or cylindrical form with its edges not quite touching and its ends tapered or cut away, so as to be readily passed through the dies. I then take a strip of sheet metal *b*, such as brass, of a width somewhat greater than the circumference of the tube, and cut away the ends and then bend it for a short distance into the form shown in Figs. 5 and 6. The ends of the tube *a* and sheet *b* are then passed through the dies and grasped by a pair of tongs. By now drawing the same through the dies the edges of said sheet *b* will be turned over and lapped and flattened, as seen in Figs. 7, 8, and 9, forming a lock-joint. After passing through said first die the tube and cover will enter and be drawn through the second die, which, being smaller than the first one, will still further flatten the joint or seam and force the same inwardly, depressing the lining-tube thereat and forming a seat for the seam or joint, whereby the cover is prevented from turning on the tube.

The depression in the lining-tube is due to the fact that the dies are different, one of them being formed with an internal flaring-mouthed groove for the lap-edges of the covering and the other without such groove.

As the lining-tube and covering are drawn through the grooved die, the edges of the latter are turned over and locked, and when subsequently drawn through the second die without the groove the locked edges are forced downward against the outer wall of the lining-tube and form a depression therein the shape of the seam. Preliminary to the drawing the edges of the cover are lapped for a short distance by means of pliers or otherwise adjacent to the beveled portion, to start the tube and cover through the grooved die, and as the drawing proceeds the die itself laps the edges, and when passing through the plain die

the folded edges of the cover are bent down and depressed into the wall of the lining-tube, as stated.

I prefer to make the lining-tube of iron or steel and the cover of brass, although any other materials found suitable may be employed in lieu thereof.

In an application of even date herewith, Serial No. 520,807, I have claimed the method or process of making said metal incased or covered tubes, and therefore lay no claim thereto herein.

Having thus fully described my invention, what I claim is—

The combination with the die having a flaring opening and a longitudinal groove therein, and the die connected therewith having a smaller plain opening, of the seam or joint former consisting of a metal bar bent over upon itself at or near the center forming two arms, one of which is beveled or tapered and located in said groove and the other bent at an angle forming a short arm, and the bracket for holding said bar in place, substantially as described.

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

his
WILLIAM × PHILLIPS. [L. S.]
mark

Witnesses to his mark:
E. D. STEELE,
HOWARD L. ISBELL.