

E. JONES.

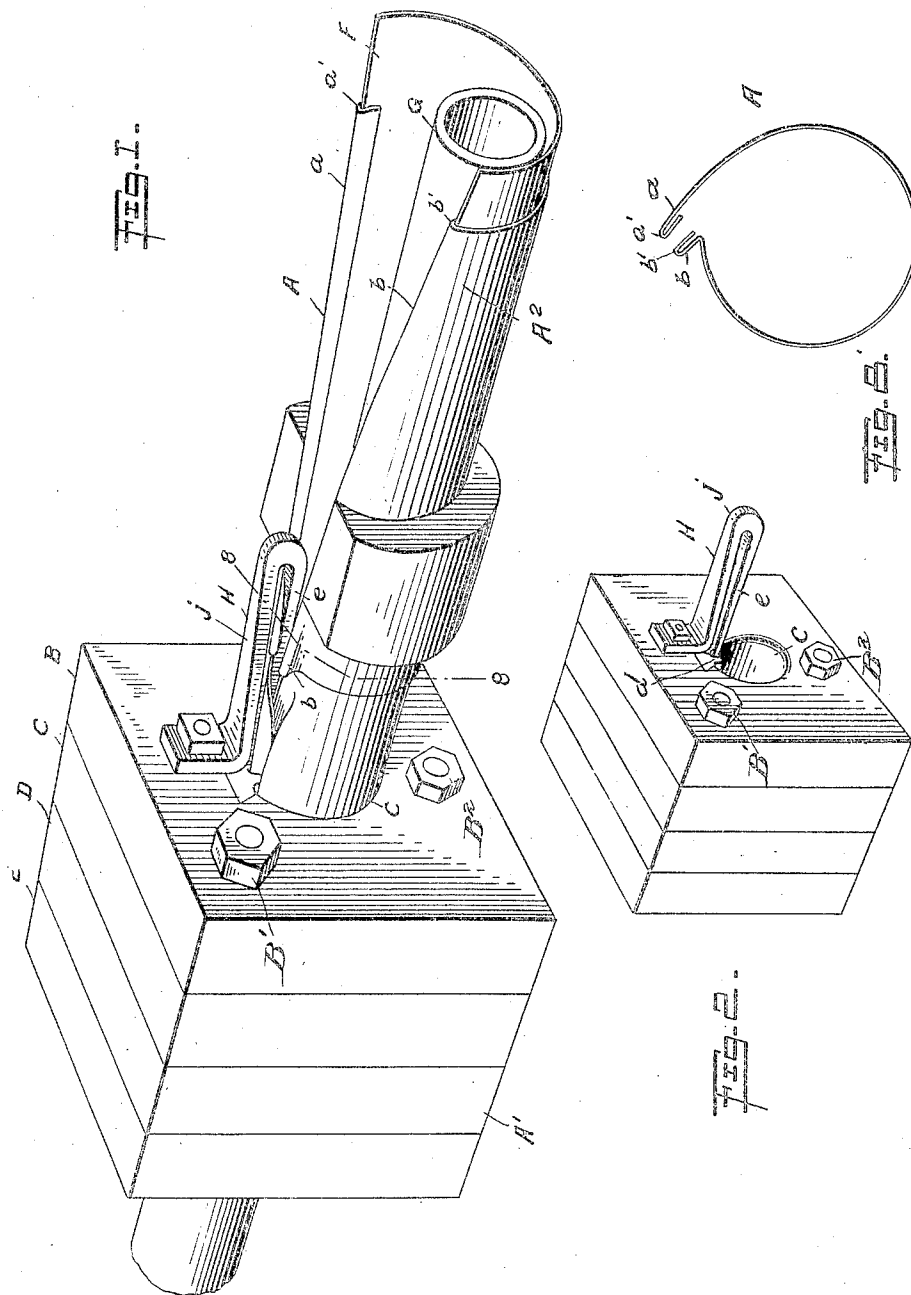
DIE FOR COVERING TUBES.

APPLICATION FILED MAR. 1, 1909. RENEWED FEB. 19, 1910.

954,030.

Patented Apr. 5, 1910.

2 SHEETS—SHEET 1.



WITNESSES

G Robert Thomas
Edmund Shilgum

INVENTOR

Edward Jones

BY

Frederic Krauth
ATTORNEYS

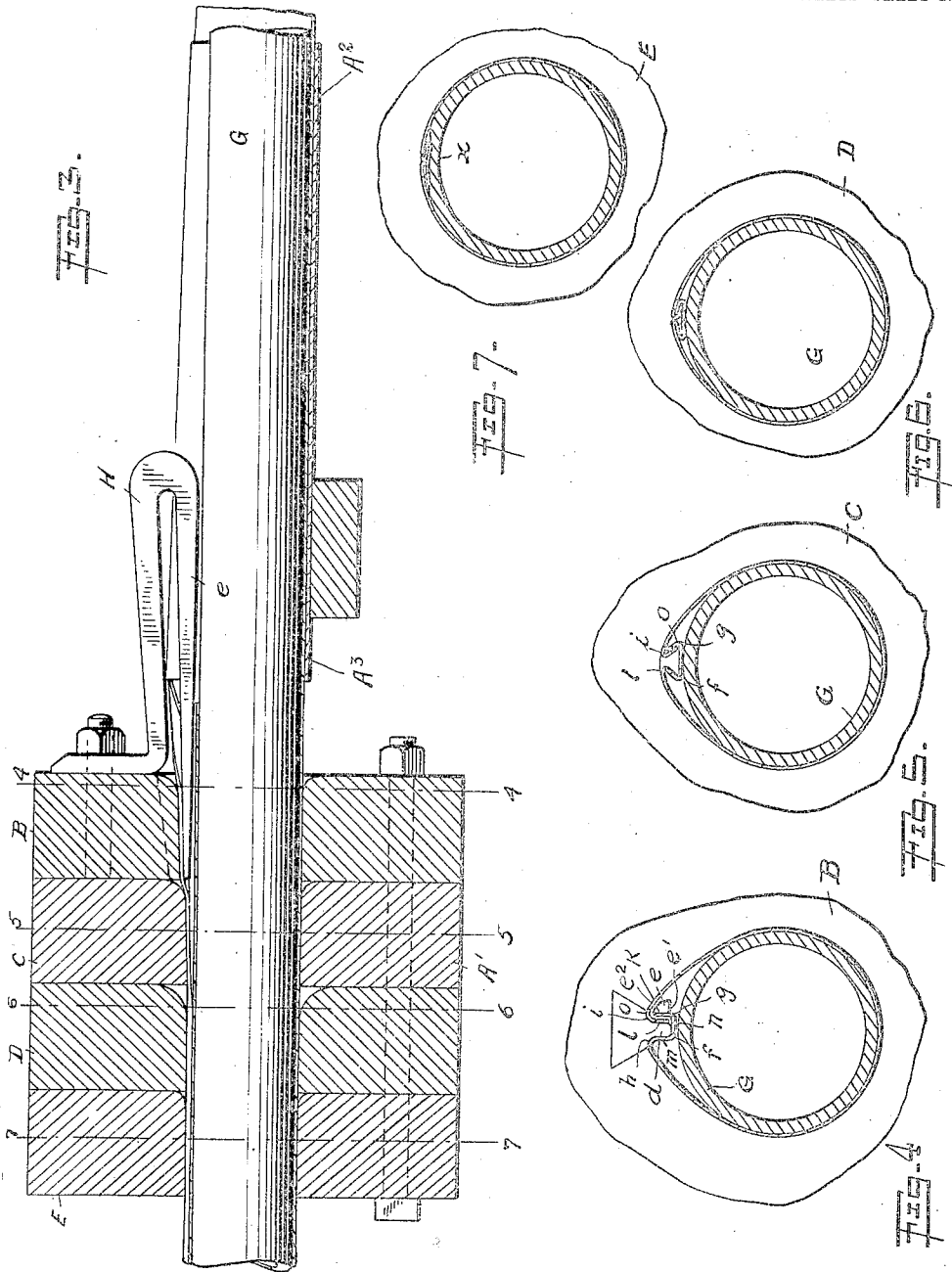
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Oliver Shilgum

INVENTOR

Edward Jones

BY

Trisend Knauth
ATTORNEYS

UNITED STATES PATENT OFFICE.

EDWARD JONES, OF NEW YORK, N. Y., ASSIGNOR TO EMANUEL WEINLANDER AND SAMUEL JACKSON, DOING BUSINESS AS THE FIRM OF WEINLANDER & JACKSON, OF BROOKLYN, NEW YORK.

DIE FOR COVERING TUBES.

954,030.

Specification of Letters Patent.

Patented Apr. 5, 1910.

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To all whom it may concern:

Be it known that I, EDWARD JONES, a citizen of the United States, and a resident of New York, borough of Brooklyn, county of Kings, and State of New York, 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 and durable die device capable of covering a tube quickly, permanently and neatly, with a jacket or shell of metal, and which can be manipulated without skilled labor and with little risk of breakage.

My invention relates to dies adapted to cover tubes as aforesaid with thin sheet metal and has for a particular object to form such coverings upon the tube with a very substantially locked joint or seam, said seam to be at the same time very unobtrusive in appearance. With my improved die as herein described, I am able, for instance, to cover ordinary iron tubing with a very thin shell of brass; this shell is constituted of a strip which may be drawn from a continuous roll, and the edges of the strip are folded by the die to make a doubly locked butt joint. After the thus covered tube has passed from the die, the joint will have been so perfectly formed and smoothed down that only an exceedingly fine line along the length of the tube will be visible. Such a tube is now in great demand in the manufacture of such articles as brass bedsteads, whereby the cost of material is greatly reduced without in any way detracting from the appearance of the finished article.

The exact character of my invention will be readily seen from the drawings in which Figure 1 is a perspective view of the complete device, a piece of tube, with a jacket being formed thereon, being shown as passing through the die; Fig. 2 is a reduced perspective view of the die proper, the guide and the tube in process of covering being omitted; Fig. 3 is a central vertical section taken on Fig. 1; Fig. 4 is a cross section along the line 4-4 of Fig. 3; Fig. 5 is a cross section along the line 5-5 of Fig. 3; Fig. 6 is a cross section along the line 6-6 of Fig. 3; Fig. 7 is a cross section along the line 7-7 of Fig. 3; and Fig. 8 is a cross section taken through the end of the guide along the line 8-8 of Fig. 1.

Essentially, my invention consists in a guide A mounted a short distance away from a system of dies A'; this system of dies comprises four dies B, C, D, and E, bolted together as shown by bolts B¹, B². Both guide and the system of dies may be mounted in any usual fashion upon a draw bench. The method of mounting and the draw bench are not shown in the drawings as they do not pertain to the invention and are well known in the art. A very common mode of attachment is by means of special vises secured or otherwise fastened to the draw bench. The guide A is of stiff sheet metal accurately formed and having, broadly speaking, a cross section similar to that of an incomplete funnel. The edges, *a*, *b* of this guide are folded over inwardly so as to form grooves, *a'*, *b'*, in which fits the strip F designed to form the jacket of the core tube G. The outer end A² of this funnel-like guide is curved very little so that the strip, as it enters the guide is only slightly bent from the flat; but as the strip advances along the guide, it is curved to embrace the tube G more and more until, when the strip leaves the guide at A³ it almost completely surrounds the tube G. The inner peripheral distance between the bottoms of grooves *a'*, *b'*, is the same at all points along the guide and equal to the width of the strip F, so that the strip, as it advances, is incapable of any lateral shifting. The inner end of the guide is, as may be seen from Figs. 1 and 3, peculiarly shaped in that the groove *b'* has been bent backward so as to be parallel with the groove *a'*; in this way the edges of the covering strip actually leave the guide for the dies parallel to one another.

Referring to the dies proper, B, C, D, E.—B is a forming die and completes the folding of the joint started by the guide A. C is a rough finishing die the function of which is to flatten the already folded joint, while dies D and E are finer finishing dies whose function is to more completely flatten and finish off the joint; the openings in dies D and E are practically circles, while the opening in die C is slightly oval at the top to allow for the thickness of the joint. The most important die is B, the opening through which is an oval with its point upward. Inserted longitudinally in this oval

at the top of the die is a downwardly projecting rib *d* the sides of which are practically parallel and curved outwardly above to unite with the inner surface of the die opening. This rib may either be integrally a part of the die or preferably may be formed separately with a tapered dove-tail base so as to be removable and replaceable in case of breakage. Attached to the front of the die is a U shaped folder *H* having a lower finger *e* substantially perpendicular to the face of the die and extending through it to its rear surface. This finger has its lower surface *e'* substantially horizontal and flush with the lower surface of rib *d*. The surface *e''* of the finger adjacent to the rib is flat while the third and remaining side is curved away from the inner surface of the die opening as shown. The lower surface of the rib *d* as also the lower surface *e'* of the finger *e* is preferably tapered to the same degree as the die opening itself as is also the curved third side of the finger *e*.

In operation the dies *A'* and guide *A* are set upon a bench, (not shown), and fixed thereto in any usual way. A covering strip *F*, the width of which must be substantially that of the inner periphery of *A* between the groove bottoms *a'* and *b'*, is then slipped into and through the guide with the edges embraced by the grooves; if properly selected the strip will be able to move freely in the guide without any lateral play or, indeed, any movement longitudinally. As the strip issues from the inner end of the guide, its ends are clipped off so that the strip may be carried clear through the four dies, without being operated upon substantially by the folder and tongue; the tube to be covered is then laid in the guide upon the covering strip and also pushed through the dies, when the combined end of covering strip and tube may be gripped by any of the usual vise or tong arrangements preparatory to drawing the tube and cover through the dies. This drawing being begun, the far edge of the strip (referring to Fig. 1) is, as shown, carried out and between the two limbs *e* and *j* of the folder and over the finger *e* between said finger and the inner surface *k* of the die where it will meet the rib *d* and be bent downward as *l*. The opposite edge of the covering strip is at the same time meeting the opposite side of the rib *d* and being turned downward at *m*, then across under the rib as *n* and finally up between the first turned edge and the finger as at *o*. This is clearly brought out in Fig. 4, as also in Figs. 5, 6, and 7. This upturning of the last named edge *o* is assisted by the back curvature of the inner or rear groove *b'* of the guide as shown in Fig. 8.

The opening in die *B* is tapered toward the axis from the front to the rear face so that the folded joint, just described, is made

tighter as it passes through the die. Die *C* has the same preferably ovate outline of die *B* but lacks the rib. It is preferably countersunk so as to receive the partially covered tube easily, and it also tapers from front to rear, but is, of course, of smaller cross section than die *B*. As the combined tube and cover passes through die *C*, therefore, the joint is flattened, the sides being bent in at *f*, *g*, and being oppositely bent at *h*, *i*. Fig. 5 shows this flattening just begun. Fig. 6 shows the condition of the joint when just fairly entered in the die *D* and Fig. 7 shows the joint when practically finished and completely flattened. Whether the inner core tube becomes indented by the joint or whether the joint stands out slightly upon the finished tube, depends altogether upon the wall thickness of the core tube and upon whether the finishing dies are circular or slightly ovate in section.

The shaping of the inner edge (referring to Fig. 1) of strip *F*, that is, the shaping of the elements *m*, *n*, and *o*, of the locked joint, is greatly assisted by the backward bending of the edge *B* of the guide as shown in Fig. 8. This backward bending gives the strip edge a tendency to upturn which extends to a considerable distance beyond the inner end of the guide. I consider this an important feature of my invention.

Another important feature of my invention resides in the use of the guide *A* and the setting of said guide with its axis and with the grooves *a'*, *b'* in definite relation to the axis of the dies and the rib and finger thereof. The guide and dies being thus definitely fixed, the strip cover is enabled to move freely with relation to the dies except longitudinally, so that the locked joint is always the same for a definite length of tube to be covered and presents at no point any inequalities or defects in locking.

While I have described my device as applied to covering tubing, it is obvious that should necessity demand, the same device will apply equally well to the covering of rods. Such rods and tubing furthermore do not require to be of circular cross section, but might have almost any desired cross section, the section of the dies being correspondingly modified, the important thing being the combination of rib, finger and guide.

Having now described my invention, I claim:

1. In a device for forming a lock jointed strip cover upon bodies of uniform external section, funnel shaped guide means in advance of lock jointing means, said guide means comprising a strip bent about its length to form an incomplete funnel the inner end of which nearly surrounds the body to be covered, and having edges inwardly folded to form grooves to receive

and guide the cover strip the peripheral distance between the bottoms of said grooves being the same for the whole length of the guide, substantially as and for the purpose described.

2. In combination with a die for covering tubing with a strip, funnel shaped guide means in advance of and separated from said die, said guide means having an opening along its entire length and each edge of said opening being provided with strip limiting means, the peripheral distance between such limiting means being uniform through the length of the guide, substantially as and for the purpose described.

3. In combination, for covering tube with a strip, a die having an ovate opening therethrough, a centrally projecting rib at the apex of said ovate, a finger passing entirely through the die and supported parallel with said rib but slightly separated therefrom and from the adjacent periphery of the die, and a funnel form guide in advance of said die, said guide being adapted to prevent other than longitudinal movement of the strip and to shape and locate said strip for entrance to the die.

4. In combination, for forming a lock jointed strip cover upon tubing, a die having an ovate opening therethrough, a centrally projecting longitudinal rib at the apex of said ovate opening, a longitudinal finger part of the length of which lies with-

in the die parallel with, but slightly separated from, said rib and from the adjacent periphery of the die and the remaining part of the length of which projects forward of the die and within one end of a funnel form guide, said guide having edges provided with limiting means the axis of said guide and the angular position of said guide edges being definitely related to the axis, rib, and finger of said die, substantially as and for the purpose described.

5. In combination, for forming a lock jointed strip cover upon tubing, a die having an ovate opening therethrough, a centrally projecting longitudinal rib at the apex of said ovate opening, a longitudinal finger parallel with but separated from said rib and the adjacent periphery of the die and projecting forwardly of the die, a funnel form guide in advance of said die and inclosing the forwardly projecting portion of the finger said guide being provided with edges adapted to hold and bend the strip cover to enter said die, and an ovate finishing die behind said first named die, substantially as and for the purpose described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

EDWARD JONES.

Witnesses:

ELMER GILR YOUNG,
JOHN A. KEHLENBECK.