March 11, 1952 J. R. ROTHEROE 2,589,142

DIE

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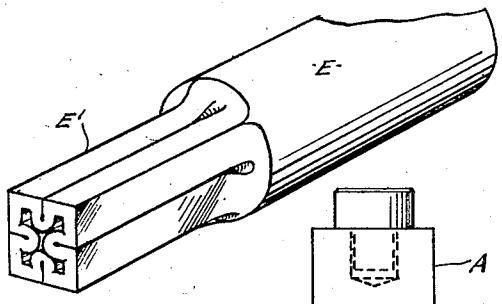


Fig. 4.

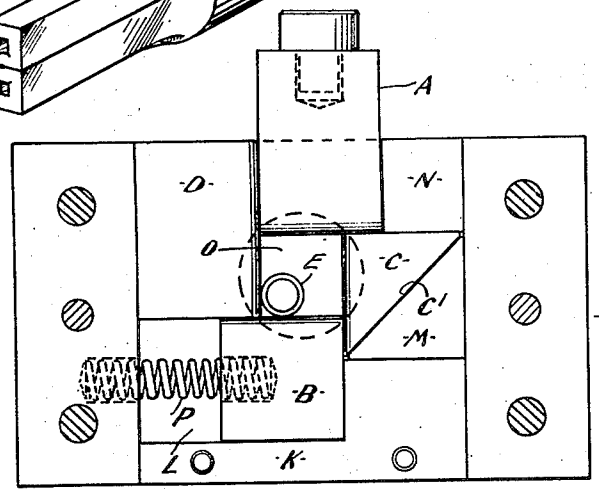


Fig. 1.

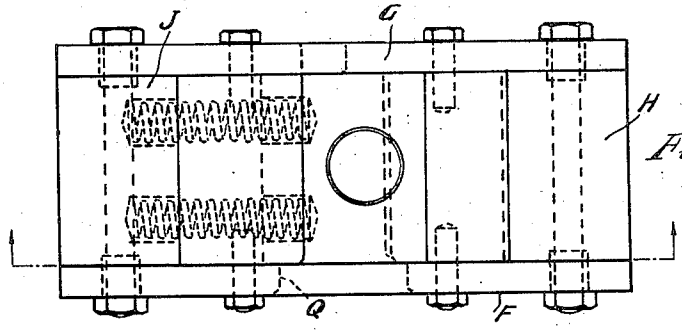


Fig. 2.

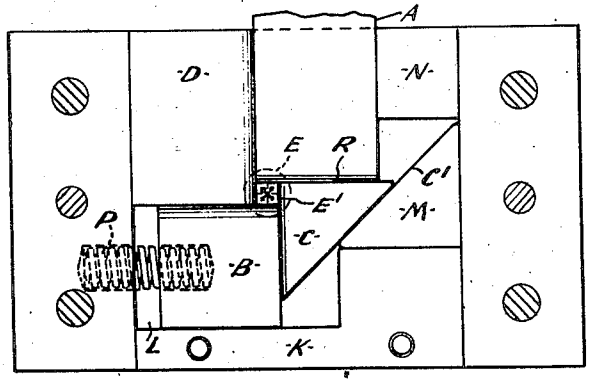


Fig. 3.

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3 Claims. (Cl. 153—13)

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This invention relates to dies, and more particularly to dies for forming a tag at the end of a length of tube prior to its introduction to tube forming rolls or discs.

The object of the invention is to provide a simple form of die which is capable of producing a tag in a single stage shaping operation.

According to the invention a die more especially for forming a tag end to a length of tube comprises a plurality of forming members operatively associated and movable relatively apart or together, at least one of said forming members being movable in a diagonal path.

In order that the invention may be clearly understood and readily carried into effect reference is directed to the accompanying drawings, wherein:

Figure 1 is a front elevation of a die according to the invention, and shown open.

Figure 2 is a plan of Figure 1.

Figure 3 is a similar view to Figure 1 showing the die closed and,

Figure 4 is a perspective view of a tag end as formed by the dies at the end of a length of tube.

A preferred construction of die as illustrated in the drawings comprises two forming members A, B, i. e. upper and lower respectively, of rectangular block form oppositely arranged and movable rectilinearly at right angles and constituting upper and lower members and a wedge shaped forming member C and a fixed block forming member D oppositely disposed thereto and constituting right and left forming members, the four members A, B, C and D forming the complement of the die, the wedge shaped member C is slidable upon the downward actuation of the upper member, on its hypotenuse side C^1 in a line diagonal to the line of movement of the upper and lower forming members A, B, the four members providing a rectangular shaping area reducible in size upon operation of the dies to close upon a work piece such as E to be tagged.

The forming members are conveniently mounted between a pair of front and back plates F, G respectively, of rectangular form closed at the shorter ends by intervening end blocks H, J, the whole being bolted together to form an open-ended housing. The base opening of the housing is closed by a block K of stepped form providing a recess L to receive the lower forming member B slidable to and fro in the recess under spring loading and of which its upper face is the shaping face. The top of the stepped block K is chamfered or serves as a support for

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a block M of triangular cross section, the hypotenuse side of which in turn serves as a slide surface for the mating and forming member C the vertical side of which is a shaping face at right angles to the shaping face of the lower forming member B. The upper forming member A whose base side is a shaping face moves between the forming member D and a block N. Both the forming member and the block N may be secured to the end blocks J, H, respectively, or they may be loosely disposed between the side plates G, F. The inner vertical side of the forming member D is the shaping face. The arrangement is such that when the four dies are assembled between the front and back plates, the upper forming member A rests partly upon or overlaps the wedge shaped forming member C and the latter overlaps at its lower apex the lower forming member B. The fixed side forming member D facing the vertical side of the wedge shaped forming member overlapping and resting upon the lower forming member B. There are thus provided four forming members each overlapping its neighbour and producing a rectangular shaping area O into which the end of the tube to be tagged is introduced. The four forming members constitute the tag forming die.

The upper member A is lowered in the usual manner and in doing so bears on the upper side of the wedge shaped member C forcing the latter to slide on the mating face of the co-operating slide block M and move inwardly towards the opposite and fixed forming member D. At the same time as the upper member approaches the lower member B the latter is moved laterally against its spring loading P by the downward movement of the wedge shaped member C, as it overlaps the end wall of the lower member. The rectangular shaping area is thus gradually reduced in area and shapes the end of the tube or work piece E previously introduced into the shaping area O to produce the tag end E^1. The entry sides of the forming members may be radiussed as at Q, and it will be appreciated that the invention is capable of modification particularly as regards the shape of the forming faces of the members. The members D may be floating instead of fixed and also spring loaded and where filling pieces such as N are required between the side plates they may be fixed or floating.

It will be appreciated that although the invention has been more specifically described in relation to its application to tag forming it is

also applicable to analogous purposes where the regular reduction of a rectangular aperture is required in the application of pressure to a work piece.

What I claim and desire to secure by Letters Patent is:

1. A tag-forming die comprising an open-ended housing, a fixed forming member secured within the housing at the upper end thereof, a block also secured within the housing at the upper end thereof and spaced from said forming member to form a slideway between them, an upper forming member disposed in said slideway for vertical sliding movement in contact with said fixed member and block, a lower forming member disposed within said housing for horizontal sliding movement in contact with the lower end of said fixed member, a forming member mounted in said housing for sliding movement in a path diagonal to the paths of movement of both said upper and lower forming members, said diagonally slidable member having a horizontal side in contact with the lower end of the upper forming member and a vertical side in contact with the lower forming member, the organization being such that the forming members cooperate to form between them a rectangular die area automatically reducible in size as the upper forming member is slid downward, tension means acting on said lower forming member and normally resisting sliding movement of all of the said slidable members thereby to maintain said die area at its maximum size, and

means for imparting downward sliding movement to the upper forming member against the tension of said tension means.

2. A tag-forming die as set forth in claim 1, said upper and lower forming members being of rectangular block form and said diagonally slidable member being of triangular form and mounted for movement on its hypotenuse.

3. A tag-forming die as set forth in claim 1, each of said slidable members being at all times in partial sidewise contact with the next succeeding member, whereby the action of said tension means is transmitted to all of said forming members.

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