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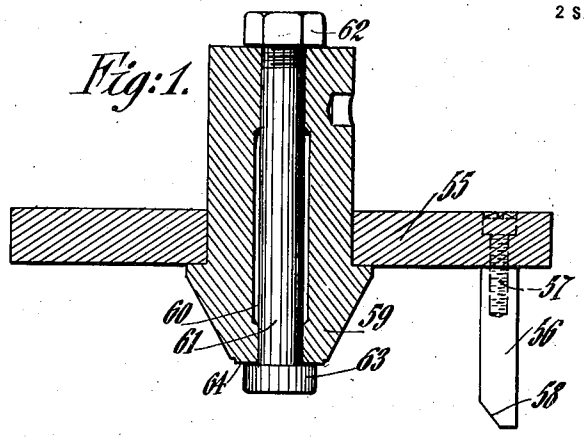
APPLICATION FILED JAN. 3, 1919.

1,335,908.

Patented Apr. 6, 1920.

2 SHEETS—SHEET 1.

Fig. 1.



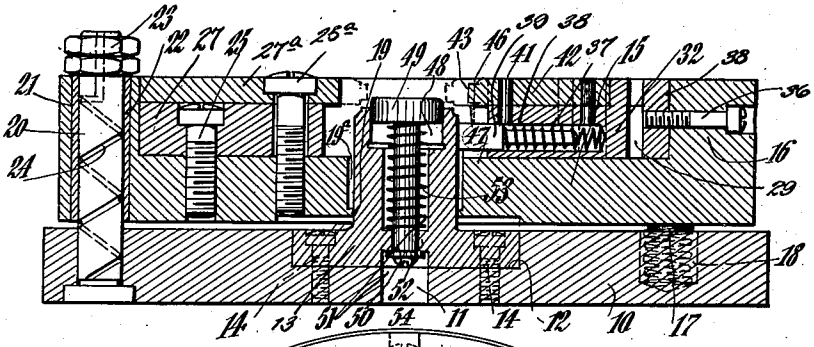
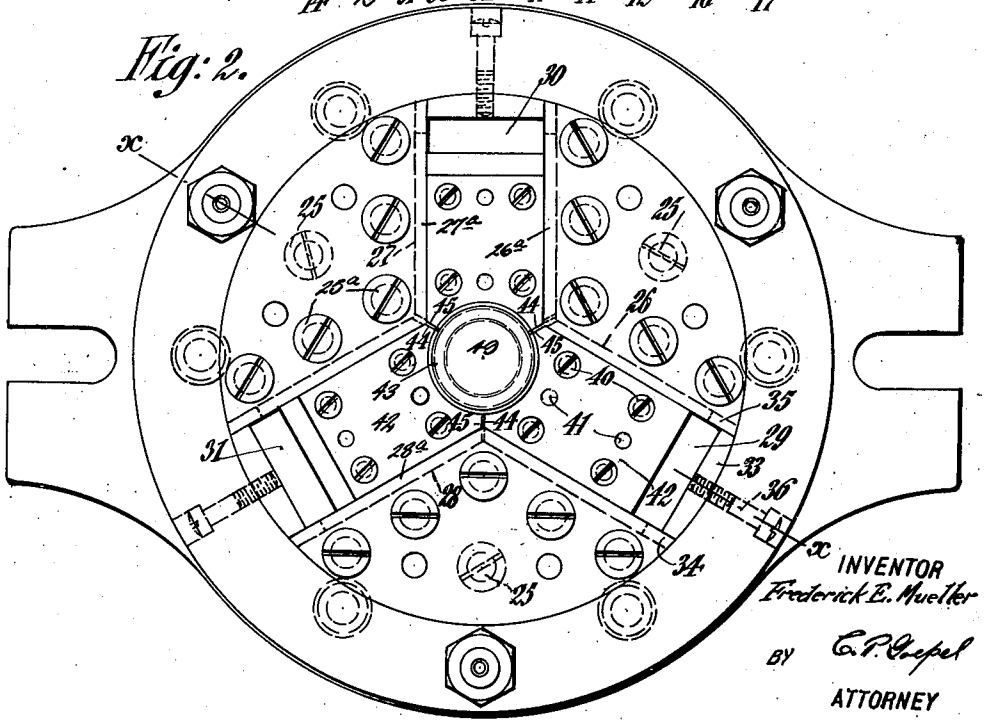


Fig. 2.



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2 SHEETS—SHEET 2.

Fig: 3.

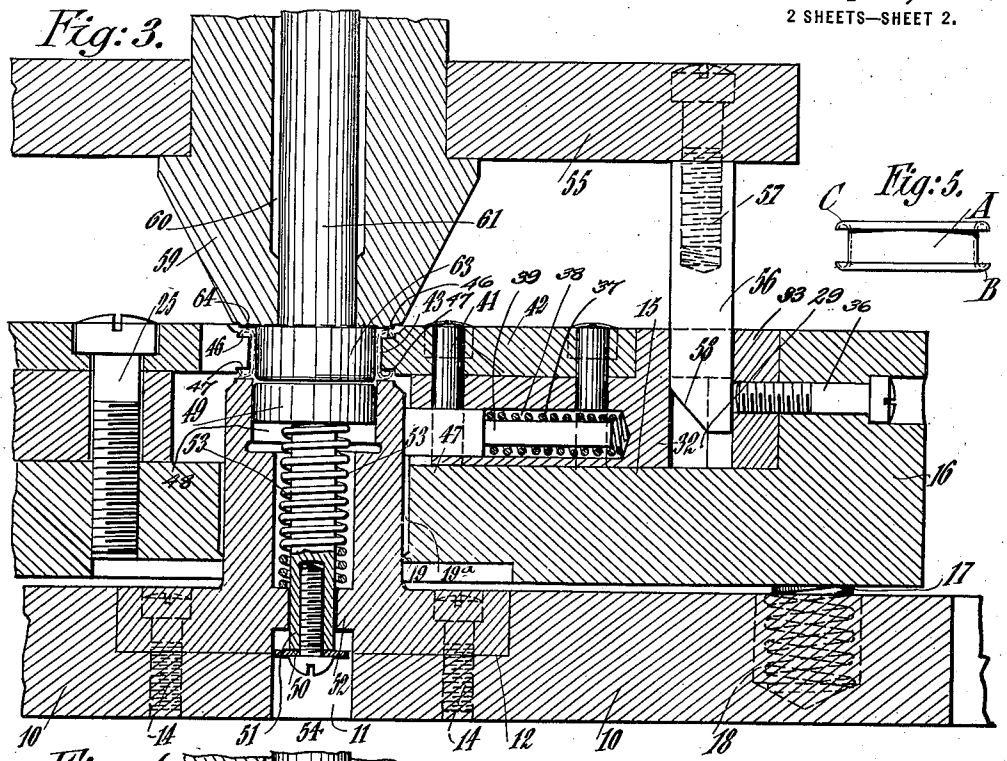


Fig: 5.

Fig: 4.

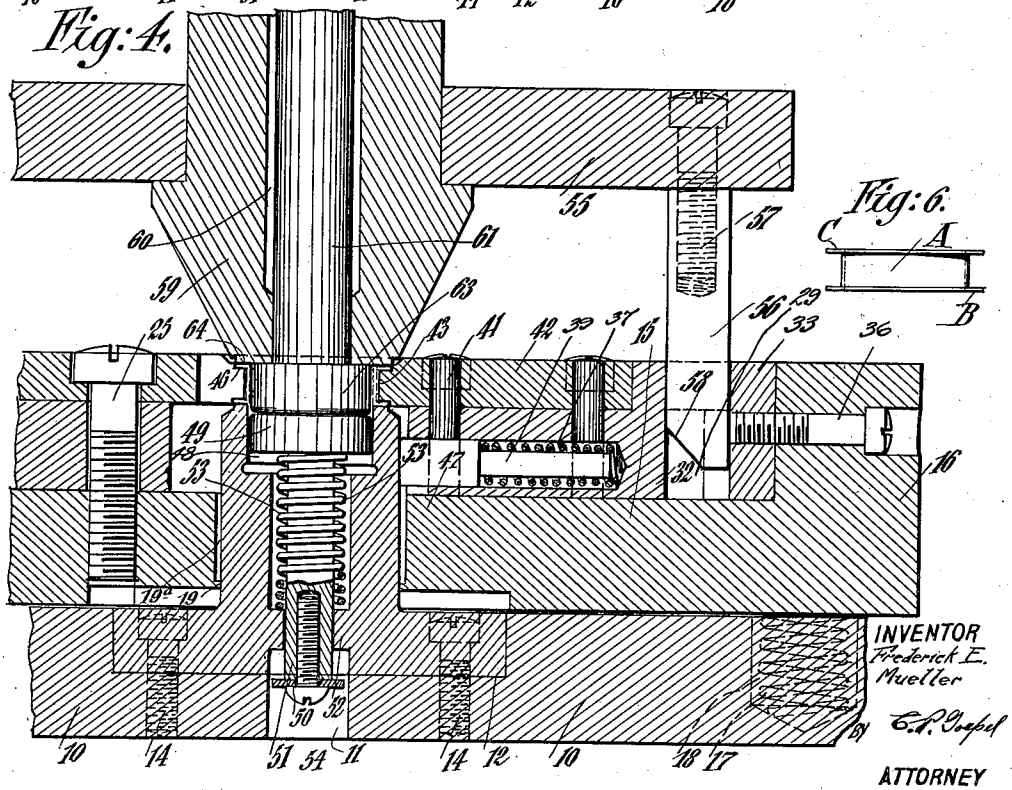


Fig: 6.

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1,335,908. Specification of Letters Patent. Patented Apr. 6, 1920.

Application filed January 3, 1919. Serial No. 269,484.

To all whom it may concern:

Be it known that I, FREDERICK E. MUELLER, a citizen of Germany, and a resident of the city of Mount Vernon, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Dies, of which the following is a specification.

The present invention relates to improvements in dies, and the particular embodiment disclosed herein, has for an object to provide a die for finishing lateral flanges on tubular articles, in such manner as to preserve the shape of the tubular portion without buckling or bulging, and without the formation of any ridges or other marks thereon. A further object is to provide such a die by which the flanges will form a square corner with the tubular portion both exteriorly and interiorly.

While in the present disclosure, a machine is shown adapted to perform a particular shaped article, it will be understood that the principle of the invention may be employed in the forming of other shaped articles.

With these and other objects in view, an embodiment of my invention is shown in the accompanying drawing, and this embodiment will be hereafter more fully described with reference thereto, and the invention will be finally pointed out in the claims.

In the accompanying drawings:

Figure 1 is a vertical sectional view through the line *x*—*x* (Fig. 2) and showing the press and punch raised and the lateral forming members retracted;

Fig. 2 is a plan view of the die member and showing the lateral forming members moved in;

Figs. 3 and 4 are enlarged vertical sectional views with parts broken away and showing the press and punch engaged with the die member, and the completion position, respectively; and

Figs. 5 and 6 show, respectively, the forms of the article before and after being acted upon by the machine.

Similar reference characters indicate corresponding parts throughout the several figures of the drawings.

Referring to the drawings, and more particularly to Figs. 1 and 2 thereof, the die member comprises a base plate 10, having a central opening 11 therein surrounded by an annular recess 12, in which is set a flanged central post or block member 13, secured by screw bolts 14. A movable plate 15, provided at its periphery with an upstanding rim 16 is mounted above the plate 10, upon supporting springs 17 disposed in pockets 18 provided therefor in the said plate 10, a central opening 19 being provided in the plate 15 which slidably engages the block 13, the block extending substantially above the upper surface of the plate, while the opening 19 is spaced from the said block along a portion of its length, as at 19^a. Guide posts 20 are provided upon the base plate 10 and extend upwardly through passages 21 in the plate 15, the said passages being provided with a bushing 22. Adjustable lock nuts 23 are provided upon the upper ends of the guide posts, and an oil groove 24 extends spirally along the length of the said posts.

Within the rim 16, and upon the plate 15, there are secured by means of screw bolts 25 segmental plates 26, 27 and 28, conforming at their curved sides with the inner side of the rim 16, and having their apices spaced from the block 13, thus providing three slots, 29, 30 and 31, extending radially from the said block, and in which there are mounted slide pieces 32. A stop 33 having projecting side portions, 34 and 35 disposed adjacent to plates 26, 27 and 28 is secured in the ends of the slots by means of a screw bolt 36, and the slide is forced toward the same by means of a spring 37, disposed in a passage 38 in the slide, a slide pin 39 engaging the block 13.

Upon the upper side of the slide pieces, there are secured by means of screws 40 and dowels 41, chuck plates 42, the front ends of which project beyond the ends of the said pieces and are circumferentially recessed as at 43, inclined surfaces 44 and 45 being provided at the extremities of the said recessed portion. These inclined surfaces are in vertical planes radial to the block 13 and in the moved-in position of the slide pieces (Fig. 2) they engage the corresponding surfaces of the adjacent slide pieces so that the three recessed portions 43 form a continuous cylindrical surface concentric to the block. The projecting ends of the plates 42 are provided at their upper and lower surfaces with lateral circumferential recesses 46 and 47, which form continuous annular recesses in the moved-in position of the slides. The

chuck plates are narrower than the slide pieces, and segmental plates 26ª, 27ª, 28ª slightly wider than the plates 26, 27 and 28 are secured upon the said plates by screw bolts 25ª, the projecting side portions of the said plates 26ª, 27ª and 28ª engaging over the projecting portions of the slide pieces and holding them in place.

The post or block 13 is provided at its upper end with a pocket or recess 48, within which there is provided a projecting and depressible head 49, the stem 50 of which extends downwardly through an opening 51 in the post and base plate 10, a shoulder 52 being provided in the opening above which there is provided on the stem a spring 53, and below which there is provided at the end of the stem a washer 54, or other suitable enlargement, which limits the upper movement of the head. The head in its raised position forms a holder for the article to be shaped, and upon which the same is placed prior to its being acted upon by the dies. Fig. 5 shows the form of the article at this stage.

The press and punch member comprises a reciprocating head 55, having three depending bars 56 secured thereto by screws 57, provided upon their lower ends with beveled surfaces 58, adapted to enter behind and force the slide pieces 32, and the chuck plates 42 carried thereby, forwardly into engagement with the article, as shown in Fig. 3.

Centrally of the head there is provided a punch 59, having a passage 60 therethrough within which there is disposed a shaft 61, provided at its screw threaded upper end with a retaining nut 62, and provided at its lower end with a head 63 of smaller diameter than the lateral surface 64 of the die. The head 63 substantially corresponds in shape to the head 49 and is of such dimensions as to enter snugly and entirely within the article as shown in Fig. 3 depressing the head 49.

In the position shown in Fig. 3, the cylindrical portion A of the article is rigidly held between the head 63 and the chucks, the cylindrical surface of the head and the recessed portions constituting continuous circumferential holding and supporting means for both the inner and the outer surfaces of the said portion A. Sufficient space is provided between the recessed portion 47 of the chuck plates and the upper surface of the block 13 to accommodate the curved lower flange B of the article, while the upper curved flange C is disposed between the recessed portion 46 and the lateral surface 64 of the punch.

Upon the further downward movement of the press and punch (Fig. 4) the movable plate 15 is depressed, moving the chuck plates downwardly relatively to the block 13, while the punch is moved downwardly relatively to the said chuck plates, straightening out the flanges B and C, so that they extend laterally at right angles to the portion A. As the press and punch is raised, the article is stripped from the head 63, as the chucks are held in engagement therewith until the said head is free, and the head 49 following the upward movement of the head 63 is projected into the article, whereupon it may be removed, and the next article to be formed placed in position.

I have illustrated and described a preferred and satisfactory embodiment of my invention, but it is obvious that changes may be made therein within the spirit and scope thereof, as defined in the appended claims.

I claim:

1. In a die for shaping lateral configurations on tubular articles, a stationary lower die member, an upper member, a resilient bed adapted to have up and down movement and surrounding said lower die member, holding members supported on said bed and adapted to be moved into engagement with said article to support the same exteriorly during the forming operation, a preliminary depressible positioning means on said lower die member adapted to position the article thereon and means on said upper member adapted to enter within the article, disengaging said positioning means therefrom and supporting said article interiorly during the forming operation.

2. In a die for shaping lateral configurations on the ends of tubular articles, a stationary lower die member, constituting a support for the article and having an annular shaping portion, an upper die member having an annular shaping portion, a resilient bed adapted to have up and down movement and surrounding said lower die member, a plurality of radially disposed holding means adapted to be projected into engagement with the article to hold the same during the forming operation and provided with holding surfaces, constituting a substantially continuous annular holding means adapted to support the said article exteriorly during the forming operation and means carried by said upper member adapted to enter within said article and form a substantially continuous support for supporting said article interiorly during the forming operation.

3. In a die for shaping lateral configurations on the ends of tubular articles, a stationary lower die member constituting a support for the article, and having an annular shaping portion, an upper die member having an annular shaping portion, a resilient bed adapted to have up and down movement, and surrounding said lower die member, a plurality of radially disposed holding means adapted to be projected into engage-

ment with the article to hold the same during the forming operation and provided with holding surfaces constituting a substantially continuous annular holding means adapted to support said article exteriorly during the forming operation, depressible preliminary positioning means on said lower member, and means on said upper member adapted to enter and support said article interiorly during the forming operation, and adapted to remove said preliminary positioning means from said article.

4. In a die for shaping lateral configurations on the ends of tubular articles, a stationary lower die member constituting a support for the article and having an annular shaping portion, an upper die member having an annular shaping portion, a resilient bed adapted to have up and down movement and surrounding said lower die member, a plurality of radially disposed holding means adapted to be projected into engagement with the article to hold the same during the forming operation, and having at their upper and lower sides annular shaping surfaces adapted on engagement with said article to engage said flanges of said article interiorly, and to coöperate with said shaping portions of said upper and lower die members engaging said flanges exteriorly to shape said flanges upon the compression of the parts, said annular shaping surfaces constituting substantially continuous surfaces in the engaged position of said holding means, and means adapted to support said article interiorly during the forming operation.

In testimony that I claim the foregoing as my invention I have signed my name hereunder.

FREDERICK E. MUELLER.