F. E. MUELLER.

DIE.

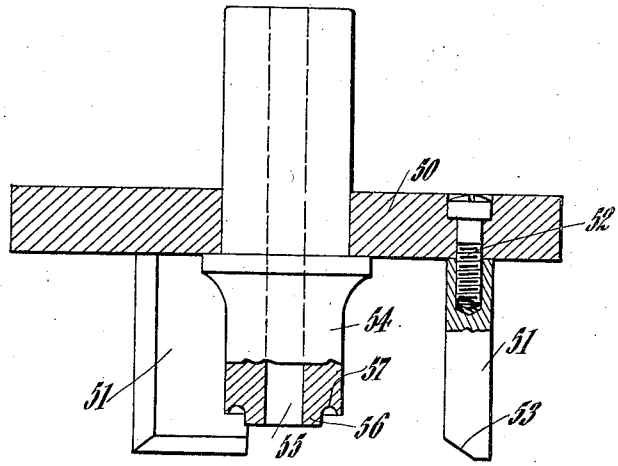
APPLICATION FILED JAN. 3, 1919.

1,335,907.

Patented Apr. 6, 1920.

3 SHEETS—SHEET 1.

Fig. 1.



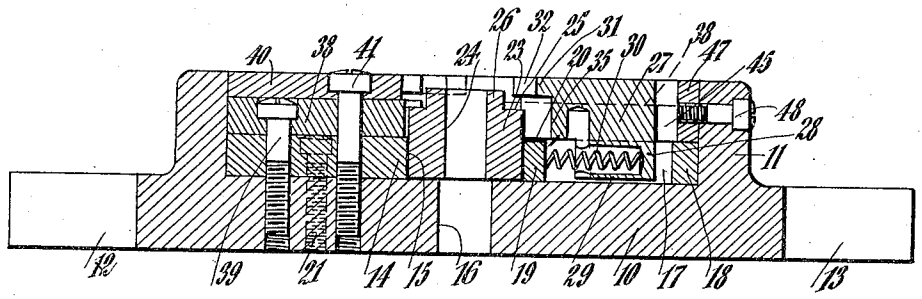
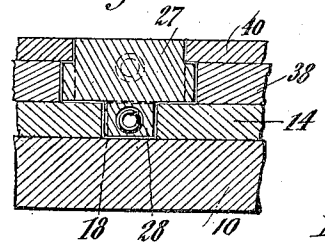


Fig. 4.



INVENTOR.

Frederick E. Mueller

BY C. P. Cooper

ATTORNEY

F. E. MUELLER.

DIE.

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3 SHEETS—SHEET 2.

Fig. 2.

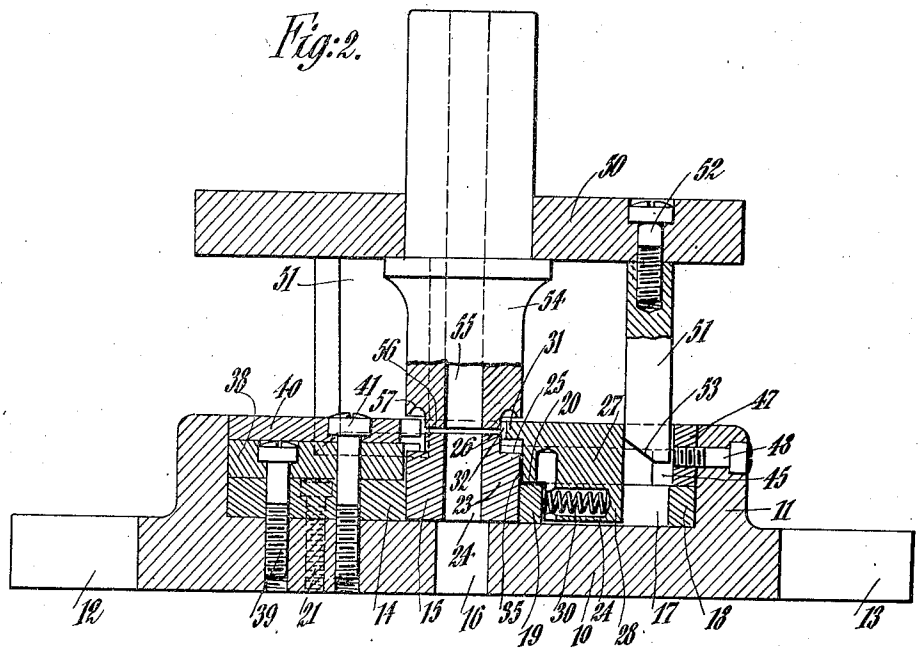
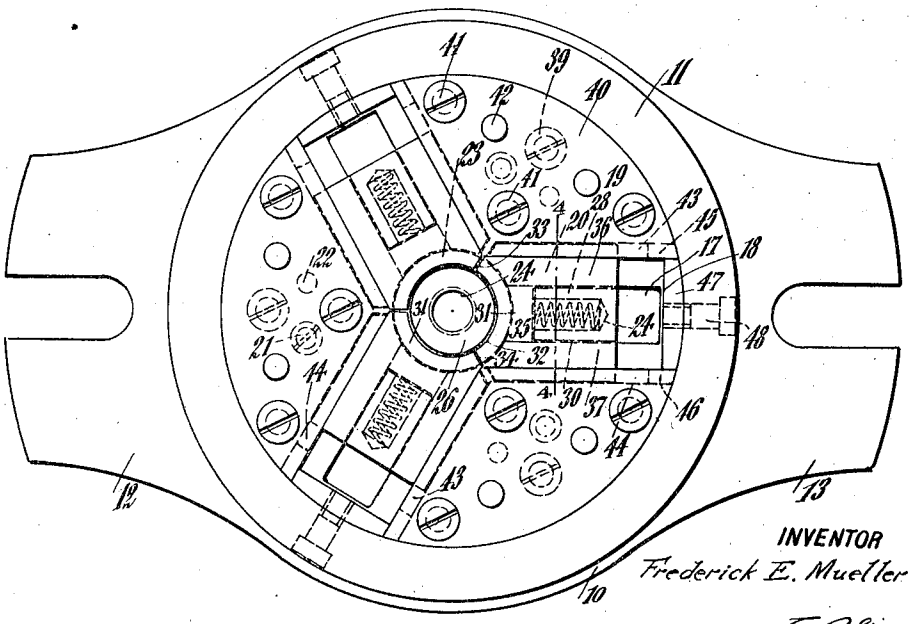


Fig. 3.



INVENTOR

Frederick E. Mueller

BY E. P. Siegel

ATTORNEY

F. E. MUELLER.

DIE.

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3 SHEETS—SHEET 3.

Fig:5.

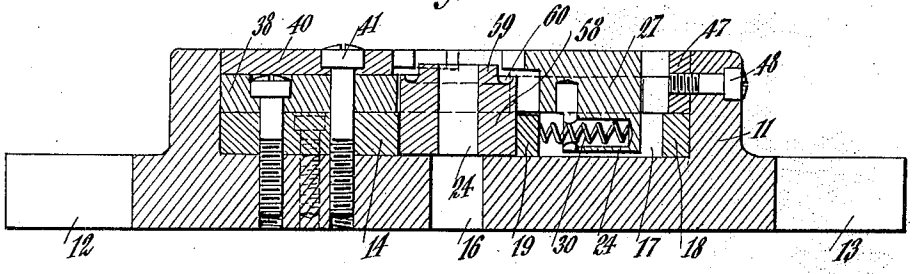


Fig:6.

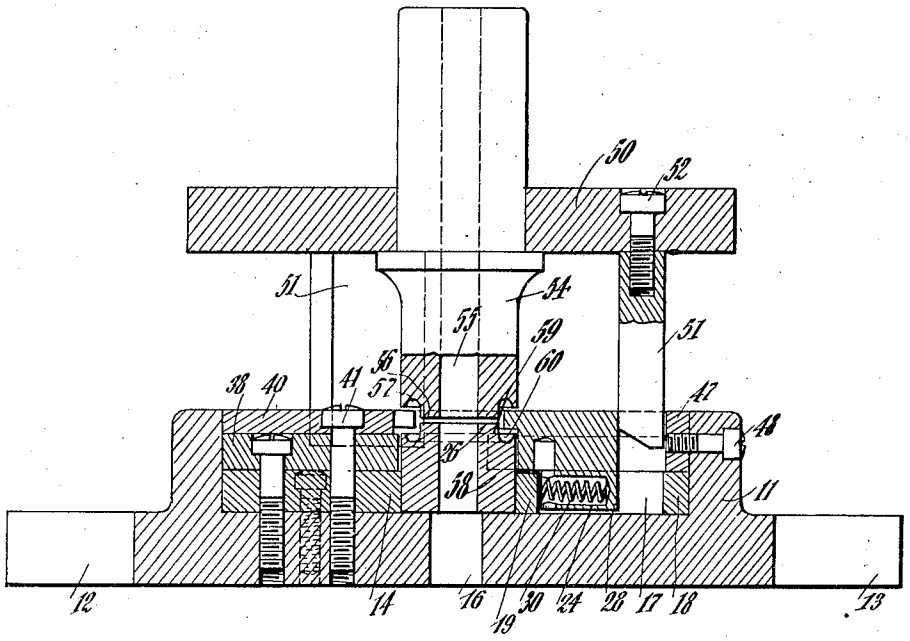


Fig:7.

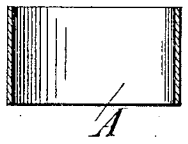


Fig:8.

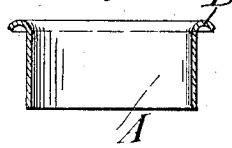
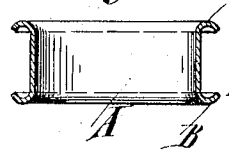


Fig:9.



INVENTOR
Frederick E. Mueller

BY G. P. Goepel

ATTORNEY

UNITED STATES PATENT OFFICE.

FREDERICK E. MUELLER, OF MOUNT VERNON, NEW YORK, ASSIGNOR TO THE NORMA COMPANY OF AMERICA, OF LONG ISLAND CITY, NEW YORK, A CORPORATION OF NEW YORK.

DIE.

1,335,907. Specification of Letters Patent. Patented Apr. 6, 1920.

Application filed January 3, 1919. Serial No. 269,483.

To all whom it may concern:

Be it known that I, FREDERICK E. MUELLER, a citizen of Germany, and a resident of Mount Vernon, 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 dies, and particularly dies for forming lateral configurations, upon tubular articles, and has for an object to provide such a device which may be operated with facility, speed and exactness, to the end that the articles formed will be uniform and may be produced in large quantities.

It is also proposed to provide improved means for supporting the article during the forming operation, in such manner that there will be no change in the tubular portion, and no danger of buckling or bulging.

A further object is to provide means for enabling the successive forming of lateral flanges at both ends of a tubular article, in the same machine, at the same time maintaining the intermediate portion of the tube in its original shape.

With these and other objects in view, an embodiment of my invention is shown in the accompanying drawings, and this embodiment will be hereinafter 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 of an embodiment of my invention showing the press and punch raised;

Fig. 2 is a similar view showing the press and punch lowered;

Fig. 3 is a plan view of the stationary portion of the die;

Fig. 4 is a sectional view taken along the line 4—4 of Fig. 3;

Fig. 5 is a vertical sectional view of the lower portion of the die adapted for forming the one end of the tubular article after the other end has been formed;

Fig. 6 shows the same with the punch in engagement therewith; and

Figs. 7, 8 and 9 illustrate the various steps in the formation of the product.

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

Referring to the drawings, and more particularly to Figs. 1 to 3 thereof, the lower die member comprises a base plate 10, provided with an upstanding annular rim 11, and having slotted attachment portions 12 and 13, extending therefrom.

Within the rim 11 and upon the base plate, there is provided a plate 14, having a central opening 15 therein concentric with a central opening 16 in the base plate, and provided with three equally spaced and radial slots 17, having their outer extremities spaced from the periphery of the plate as at 18, and their inner extremities spaced from the opening 15 by abutment portions 19, the upper surfaces of which are slightly below the surface of the plate, thereby forming slideways 20 in alinement with the slots. The plate 14 is secured in place by screws 21 and dowels 22 suitably placed, and engaging the base plate.

A removable block 23 having a central opening 24 therein is disposed in the opening 15 of the plate 14, and is supported upon the base plate. At its upper side the block is shouldered as at 25, forming an annular arbor 26 upon which the tubular member A to be formed is placed, as indicated in dotted lines, the arbor being of a diameter capable of snug insertion in the said shoulder.

Surrounding the block 23, there are provided radial slide chucks comprising blocks 27, having upon their under sides slide pieces 28 engaging the slots 17, and provided with sockets 29 therein, in which are disposed helical springs 30, bearing at one end upon the base of the socket and at the other end upon the abutment 19. The front face of the chucks is provided with an inwardly projecting portion 31, disposed circumferentially of the arbor 26 in the innermost portion of the chuck, its face 32 having a radius substantially equal to the exterior surface of the member A, and the ends of the portion 31 are mitered as at 33 and 34, so that the ends of the respective portions 31 of the several chucks contact as shown in Fig. 3, and form a continuous annular holding ring about the said member A. The part 35 between the portions 31 and 28 is circumferential of the block 15, and at each side thereof there are provided lateral slide extensions 36 and 37.

Sector plates 38 are secured upon the plate 14 between the chucks by means of a screw

39, and sector face plates 40 are secured thereon by means of screws 41 and dowels 42 passing through the plates 38 and 14 into the base plate, the said face plates extending above the lateral extensions 36 and 37 to form slideways 43 and 44 therefor.

Stops 45 and 46 are provided in the slideways 43 and 44, to limit the outward movement of the chucks, the same being formed integral with a backing piece 47, secured to the rim 11 by means of a screw 48. Thus in the outward position of the chuck a space is provided between the outer end thereof, and the backing piece as clearly indicated in Fig. 1.

The press and punch comprises a reciprocating head 50 having three depending bars 51 secured thereto by screws 52, provided upon their lower ends with beveled surfaces 53 adapted to enter behind and force the chucks forwardly into engagement with the member A.

Centrally of the head 50 there is provided a punch 54, having a passage 55 therethrough, and provided upon its face with an annular rim 56 in alinement with the arbor 26, and an annular groove 57 surrounding the rim, the said rim 56 adapted to enter the member A, and with the arbor 26 support the same interiorly, while the groove 57 upsets the end of the member A upon the upper surface of the portions 31 forming the flange B.

The punch it will be seen, operates after the chucks are moved inwardly, and during the forming operation supports the member A exteriorly against buckling. Fig. 8 illustrates the product thus far.

The block 23 is thereupon removed and a block 58 is inserted in its place. This block 58 is provided upon its upper end with an arbor 59 surrounded by an annular groove 60 substantially corresponding in shape and dimensions to the groove 57 of the upper die. The product of the first operation is placed in the die with the flange B resting in the groove 60, and thereupon a flange C is produced upon its other end in a similar manner to the production of the flange B.

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 forming outwardly bent flanges on tubular articles, a support for the article to be formed, an upper member adapted to engage the article to shape the same, a plurality of radially disposed holding members, movable transversely to the direction of movement of said upper member, means adapted to project said holding members into engagement with said article to hold the same during the forming operation, the holding surfaces of said member in said projected position constituting a substantially continuous annular holding means for supporting said article exteriorly, the upper surface of said holding means constituting a substantially continuous laterally disposed surface adapted to coöperate with said upper member to form a lower shaping portion to shape the article, and means on said support and said upper member adapted to support the article interiorly during the forming operation.

2. In a die for forming outwardly bent flanges at the ends of tubular articles, a support for the tubular unflanged article, shaping means adapted to engage the article to shape the flange at one end of the article, holding members adapted to support the tubular portion of said article during the forming operation, and a second support having supporting means corresponding to the shape of said shaping means adapted to support said article with its flange formed at one end by said shaping means, said shaping means adapted to form a corresponding flange at the other end.

3. In a die for forming outwardly bent flanges at the end of tubular articles, a support for the tubular unflanged article having a positioning portion extending partially into said article, shaping means adapted to engage the article to shape the flange at one end of the article, and having positioning means adapted to extend partially into said article and adapted with said positioning means of said support to fill and to support said article interiorly during the shaping of said article, and means engaging and supporting the same exteriorly to prevent lateral collapse thereof.

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

FREDERICK E. MUELLER.