T. D. DALLMEYER AND G. G. BROWN.

PRESS.

APPLICATION FILED MAY 10, 1917.

1,326,852.

Patented Dec. 30, 1919.

2 SHEETS—SHEET 1.

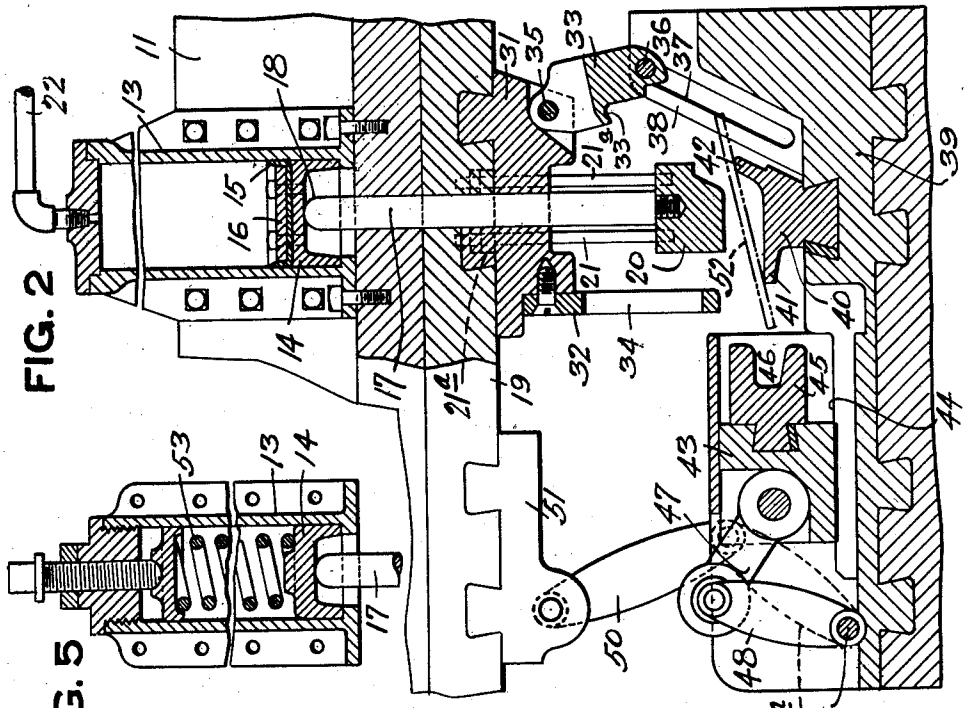


FIG. 2

FIG. 5

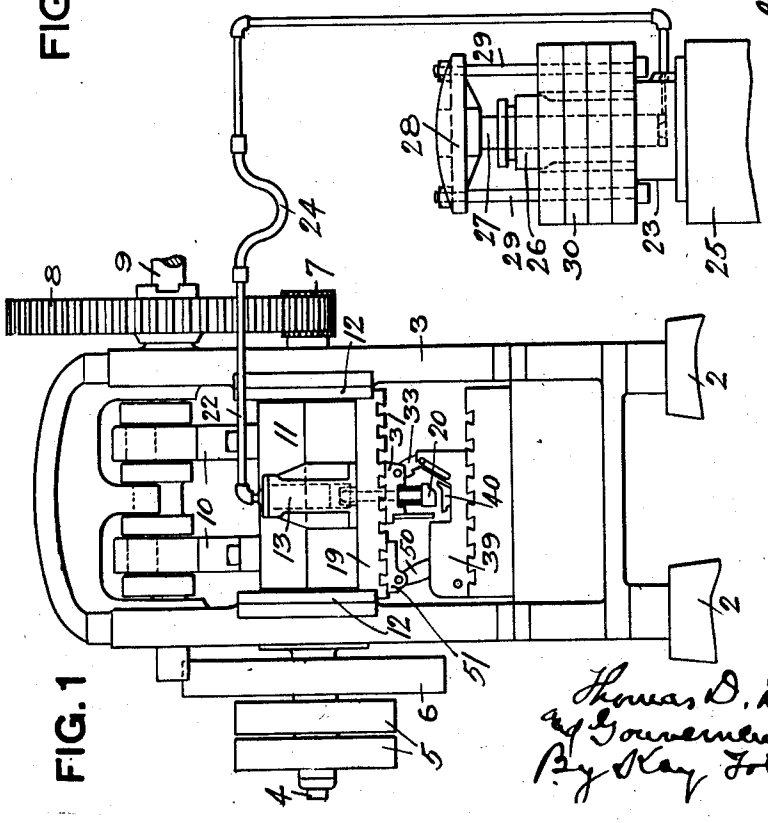


FIG. 1

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2 SHEETS—SHEET 2.

FIG. 3

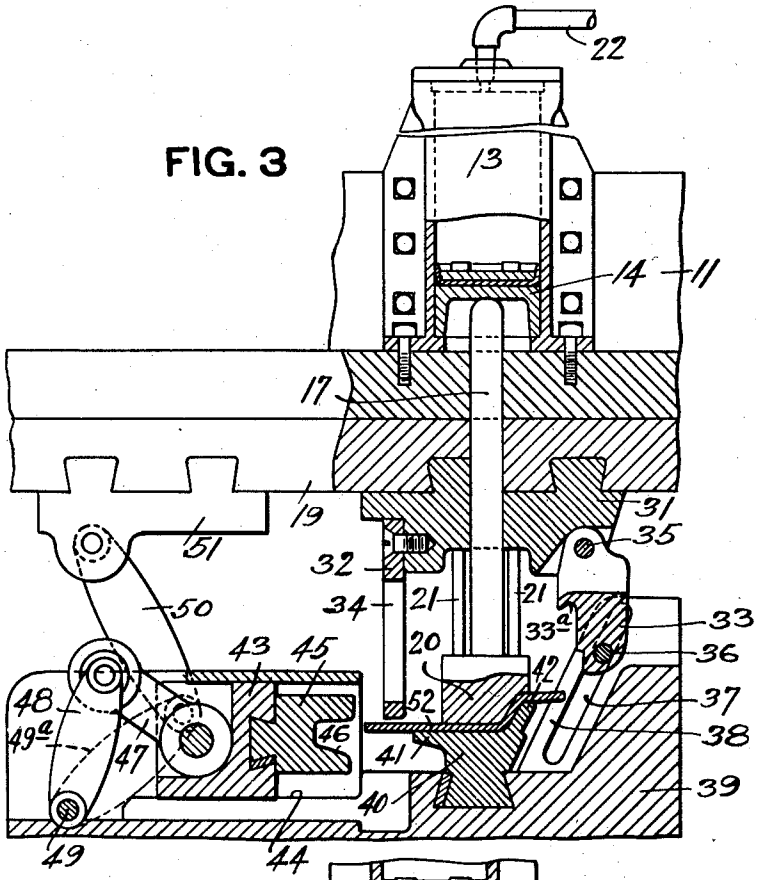
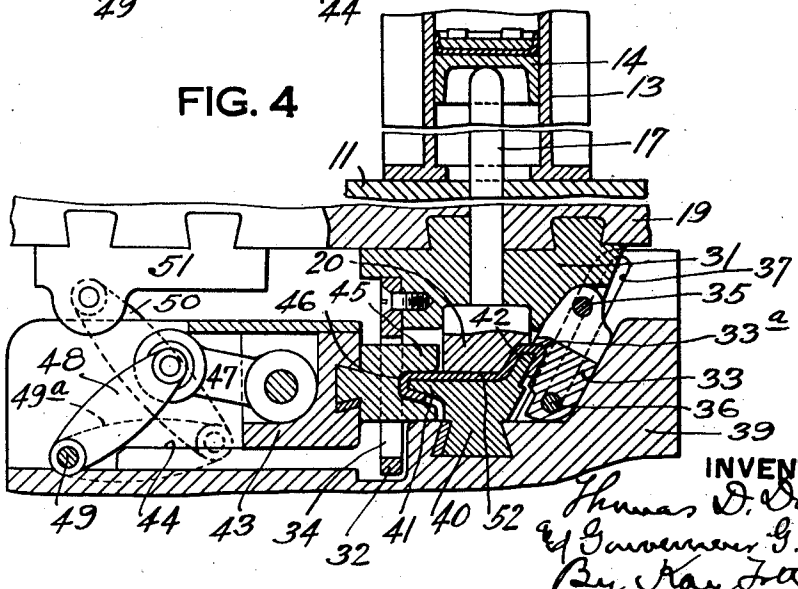


FIG. 4



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UNITED STATES PATENT OFFICE.

THOMAS D. DALLMEYER, OF PITTSBURGH, AND GOUVERNEUR GRAHAM BROWN, OF OAKMONT, PENNSYLVANIA, ASSIGNORS TO VALLEY FORGING COMPANY, OF VERONA, PENNSYLVANIA, A CORPORATION OF DELAWARE.

PRESS.

1,326,852. Specification of Letters Patent. Patented Dec. 30, 1919.

Application filed May 10, 1917. Serial No. 167,683.

To all whom it may concern:

Be it known that we, THOMAS D. DALLMEYER and GOUVERNEUR G. BROWN, citizens of the United States, and residents of Pittsburgh and Oakmont, respectively, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Presses; and we do hereby declare the following to be a full, clear, and exact description thereof.

Our invention relates to presses, and more particularly such as are adapted for forming metal articles with inwardly-projecting ends.

The manufacture of such articles heretofore has generally required separate apparatus—one for shaping the body of the article, and another and separate apparatus for bending in the ends of the article around a former or anvil.

The object of our invention is to provide for the forming of the body of the article and the bending-in of the ends by one stroke of the press, thereby greatly reducing the time and, at the same time, the cost of such pressing operation.

To these ends our invention consists, generally stated, in a press having a die adapted to be moved into contact with the metal supported on a stationary die, and followers moving with the main die and adapted to bend the ends of the metal around the anvil-block or die, the body-forming die holding the metal while the bending operation is being performed.

In the accompanying drawings, Figure 1 is a vertical elevation of our improved press; Fig. 2 is an enlarged sectional view showing the dies in position before the operation begins; Fig. 3 is a like view showing the body-forming die in contact; Fig. 4 is a like view showing the metal bent inwardly around the anvil-block; and Fig. 5 shows a modified form of our invention.

In the drawings, the numeral 2 designates the base-blocks upon which the frame 3 of the press is supported. This frame has the shaft 4 journaled therein with the pulleys 5 and fly-wheel 6. Pinion 7 on the shaft 4 meshes with the gear-wheel 8 on the crank-shaft 9. The pitman 10 connects the crank-shaft with the cross-head 11 moving in guides 12.

The cross-head 11 carries the cylinder 13 within which is the cup-piston 14 provided with the packing 15 held in place by the washer 16. The disconnected piston-rod 17 has the rounded end-portion 18, which engages the piston 14, said piston-rod extending through the die-plate 19 of the cross-head, and said piston carries at its end the die 20. Guide-rods 21 are connected with the die 20 and pass through the guide-openings in the die-plate 19. The guide-rods 21 have the nuts or stops 21^a which are engaged by the die-plate in its advanced movement to move the die 20.

A pipe 22 leads into the upper end of the cylinder 13, said pipe being connected up with an ordinary accumulator 23, an intermediate flexible pipe section 24 being provided to permit of the movement of the cross-head 11.

The accumulator 23 consists of the base-block 25 with the stationary cylinder 26 supported thereon. The ram 27 enters the cylinder 26 and a cross-head 28 is connected to said ram. Bolts 29 are carried by the cross-head 28, and said bolts support the weights 30.

Mounted in the die-plate 19 is the die-block 31, which carries the forming-tools or dies 32 and 33. The die 32 has the opening 34 formed therein. The die 33 is pivotally mounted, as at 35, on the die-head 31, and a pin 36 in said die engages the inclined slot 37 in the guide 38 which rests on the die-block 39.

A stationary or anvil-die 40 is mounted on the die-block 39, said anvil being provided with the projecting portions 41 and 42 although, of course, the form of this anvil-block will vary according to the shape of the article to be formed.

A horizontally-reciprocating die-block 43 is adapted to move in the guide 44 on the anvil-block 39, and said die-block carries the die 45 with the bifurcated end 46 for the purpose fully hereinafter set forth. This horizontally-movable die-block 43 is adapted to be moved back and forth by the advancing and withdrawing of the press, and is accordingly connected up to the cross-head of the press by means of the following parts:

An arm 47 is connected to the movable die-block 43, and the outer end of said arm has pivoted thereto the lever 48, which in turn is fixed to the lever-shaft 49. A lever 49^a

on this shaft is pivoted to a lever-arm 50, pivotally connected to the block 51 dovetailed in the die-block 19.

In the operation of the press, the piece of metal 52 to be operated upon is placed in position on the anvil-die 40 and the cross-head of the press is advanced and as it is advanced, the body-forming die 20 is likewise advanced until it comes in contact with the metal 52, whereupon the metal is pressed due to the resistance to the movement of the piston 14 caused by the pressure in the accumulator, which is weighted to give the necessary resistance to cause the bending of the metal on the anvil-block 40 into the shape indicated in Fig. 3.

As illustrated, the die 20 moves in advance of the dies 32 and 33, and the body of the metal is pressed to shape by the action of the die 20 before the dies 32 and 33 come into action. As the press-head continues to advance, the dies 32 and 33 engage the overhanging ends of the metal plate 52, and the action of said dies is to bend the metal downwardly, the die 32 acting to bend the metal down at practically a right angle, while the die 33 with its forming face 33ª acts to bend the metal over the projecting end 42 of the anvil-die 40 and causing the metal to conform to the shape of said projecting portion 42.

As the advanced end of the die 42 passes beyond the anvil-die to the position indicated in Fig. 4, the advancing of the press-head acts through the system of levers above described to advance the die-head 43 so that the die 45 engages the metal and bends it in under the projection 41 of the anvil-die 40, said die 45 passing through the opening 34 formed in the die 32. During this operation of bending the ends of the metal, the die 20 is held in position by the pressure of the accumulator, the piston 14 yielding and moving up in the cylinder 13 as the cross-head advances to complete the stroke, and when the article has been bent to the shape indicated in Fig. 4 on the return stroke of the press, the die 45 is withdrawn through the opening 34 in the die 32, and upon the further movement of the press-head the dies 32 and 33 withdraw as well as the cylinder 13 and the die 20, which is moved by the engagement of the die-plate 19 with the nuts 21ª on the rods 21, bringing the parts back to the position indicated in Fig. 2.

In Fig. 5 we have illustrated the use of a spring 53 to give the required resistance to the movement of the die 20 when it strikes the metal and to give the necessary force to bend the metal.

By our invention, we provide a machine in which the several bending operations required to form the article are all accomplished by the one movement of the press-head, thereby dispensing with the steps of first forming or bending the body portion in one press, and then removing the metal so bent and subjecting it in other apparatus to bending operations for bending the ends of the article inwardly where an article of this character is to be formed. The formation of the entire article by one movement of the press-head naturally greatly reduces the time as well as the expense of the operation.

What we claim is:

1. In a press, the combination of a reciprocating member, a yielding-mounted die carried thereby, means for creating sufficient resistance to the movement of said die to form the body of the article, a stationary die having an overhanging portion, a die following said body-forming die acting on the portion of the metal projecting beyond said overhanging portion, and a horizontally-moving die adapted to force the metal under said overhanging portion.

2. In a press, the combination of a reciprocating member, a yieldingly-mounted die carried thereby, means for creating sufficient resistance against the movement of said die when moved to bend the metal to form the body of the article, a stationary die, a die following said body-forming die adapted to engage the metal extending beyond said stationary die, said second-named die having an opening therein, and a horizontally-moving die adapted to pass through said opening, and connections between said horizontally-movable die and the press-head, whereby a reciprocatory movement is imparted to said horizontally-movable die.

3. In a press, the combination of a reciprocating member, a yielding die carried thereby, means for creating sufficient resistance to the movement of said die when moved to form the body of the article, a stationary die, a die carried by said reciprocating member following said body-forming die adapted to engage a portion of the metal projecting beyond said stationary die, said second-named die having an opening therein, a horizontally-movable die adapted to pass through said opening in said second-named die, and lever connections between said horizontally-movable die and the said reciprocating member, whereby reciprocating movement is imparted to said horizontally-movable die.

In testimony whereof, we the said THOMAS D. DALLMEYER and GOUVERNEUR G. BROWN, have hereunto set our hands.

THOMAS D. DALLMEYER.
GOUVERNEUR GRAHAM BROWN.

Witnesses:
ROBT. D. TOTTEN,
JOHN F. WILL.