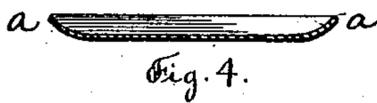
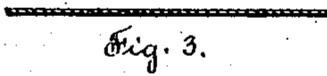
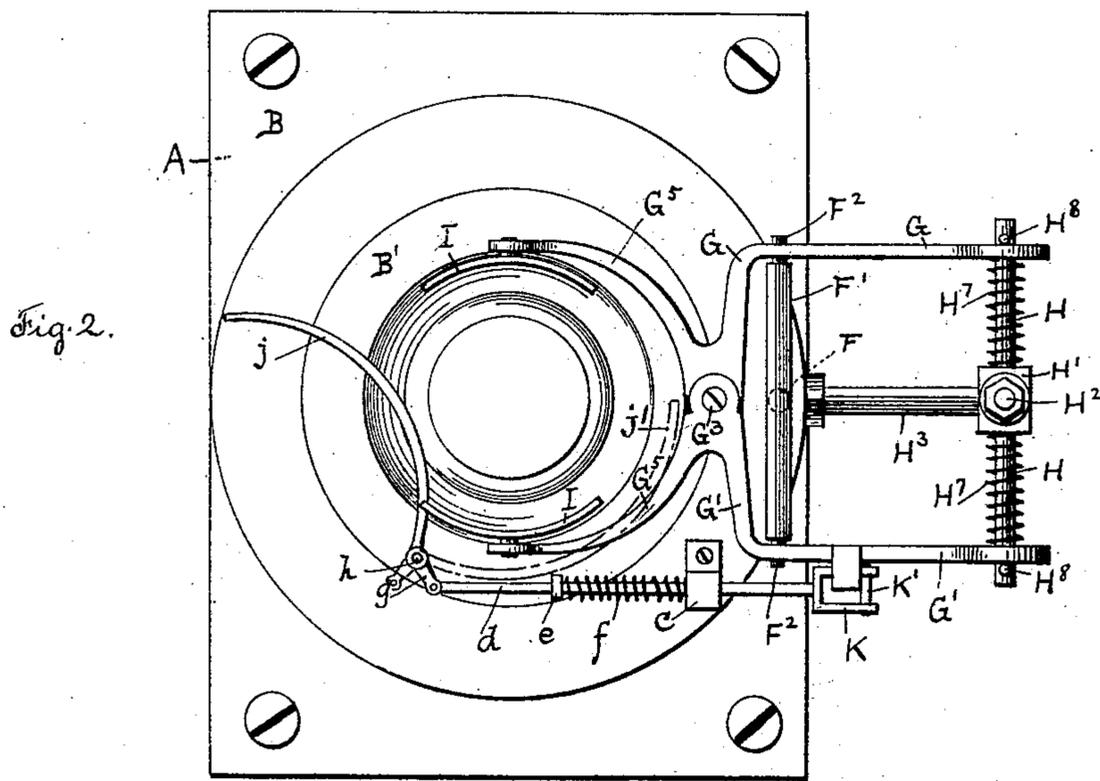
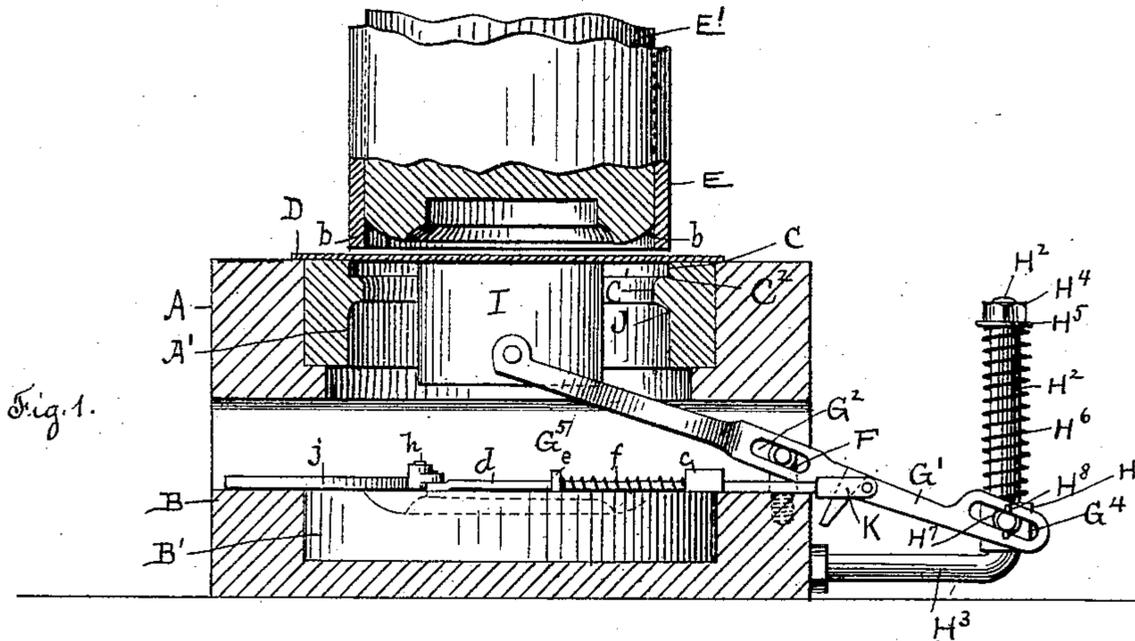


(No Model.)

W. A. TURNER.  
DIE PRESS.

No. 543,711.

Patented July 30, 1895.



Witnesses  
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# UNITED STATES PATENT OFFICE.

WILLIAM A. TURNER, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO  
EDMUND CONVERSE, OF SAME PLACE.

## DIE-PRESS.

SPECIFICATION forming part of Letters Patent No. 543,711, dated July 30, 1895.

Application filed July 2, 1891. Serial No. 398,235. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. TURNER, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain Improvements in Die-Presses, of which the following is a specification, reference being had to the accompanying drawings, showing such portions of a die-press as embody my invention, and in which—

Figure 1 represents in vertical central sectional view the upper die and inclosing die-box and the lower die-box with its inclosed die shown in full, also representing a portion of the punches, partly in sectional view, and also a side elevation of the mechanism for delivering the finished blank from the dies. Fig. 2 shows a top view of the lower die and die-box and a top view of the mechanism for delivering the finished blank, the upper die and die-box having been removed. Fig. 3 is a central sectional view of the blank as it is cut from the metal sheet D by the action of the punch E and the upper die. Fig. 4 is a sectional view of the blank after its edge has been turned by its passage past the internal rib C', and Fig. 5 is a central sectional view of the completed blank after it has been pressed into shape by the action of the punch E' and the lower die.

Similar letters refer to similar parts in the different figures.

My invention relates to die-presses for stamping sheet metal; and it consists in the construction and arrangement of a pair of dies in the same vertical plane and co-operating punches by which a sheet-metal blank is cut and formed into its desired shape, and also in the mechanism, as hereinafter described, by which the finished blank is delivered from the dies.

My present invention is applicable to die-presses for stamping sheet metal and employing dies of a variety of shapes, as may be determined by the shape of the desired product.

In the accompanying drawings, I have represented the dies therein shown of a suitable shape to cut a circular blank, as shown in Fig. 3, from a piece of sheet metal and press the same into the shape represented in sectional view in Fig. 5, and designed, when the

central portion has been punched out, to form the face-plate of a pipe-collar. Other forms of dies can be used by which the shape of the finished product can be varied.

Referring to the accompanying drawings, A denotes the upper die-box, containing the upper die A'.

B denotes the lower die-box, containing the lower die B', the two dies A' and B' having their axes coincident and in the same vertical plane; the die-boxes A and B being supported in the usual manner upon the bed or table of a die-press.

The diameter of the upper die A at C is equal to the desired diameter of the circular blank to be cut from the metal sheet D.

The die A is provided with the internally-projecting rib C', forming a shoulder C<sup>2</sup>, upon which the edge of the circular blank is carried by the downward motion of the sleeve E, which forms the cutting-punch by which the circular blank is cut from the metal sheet D. At the end of the downward motion of the sleeve E the concentric punch E' advances to carry the circular blank downward upon the face of the lower die B', and between the opposing faces of the lower die B' and the reciprocating punch E' the circular blank is pressed into its desired shape. The action of the reciprocating punch E' in carrying the circular blank downward past the rib C' will cause the edge of the circular blank to be turned up, as shown at a, Fig. 4, thereby reducing the diameter of the blank to allow it to pass the internal rib C'. The turned edge a of the blank, resting against the curved portion b of the forms of the punch E', will aid the blank in being held concentrically upon the face of the punch as it is carried downward upon the lower die B'.

In the lower die-box B, I place a fixed stud F, (represented by a circular broken line in Fig. 2,) provided with the cross-bar F', Fig. 2, having at its ends the circular gudgeons F<sup>2</sup>, upon which are pivoted the levers G G', the gudgeons F<sup>2</sup> entering slots G<sup>2</sup> in the levers, by which the levers are allowed to both rock and slide upon the gudgeons F<sup>2</sup>. The two levers G and G' are hinged together at G<sup>3</sup> and the outer ends of the levers G G' are provided with slots G<sup>4</sup>, inclosing the rods H H, which

are carried in a block  $H'$ , held upon and capable of sliding vertically upon the post  $H^2$ , which is attached by the horizontal section  $H^3$  to the lower die-box B. The upper end of the post  $H^2$  is provided with a nut and washer  $H^5$ , between which and the sliding block  $H'$  is placed the spiral spring  $H^6$ , by which the block  $H'$  and connected rods  $H H$  are held in their normal position at the bottom of the post  $H^2$ , as shown in Fig. 1 of the drawings. Between the block  $H'$  and the slotted ends of the arms  $G G'$ , I place the spiral springs  $H^7 H^7$ , by which the ends of the levers  $G G'$  are separated and held in their normal position against the pins  $H^8 H^8$ . The inner ends of the levers  $G G'$  are curved at  $G^5 G^5$ , and to their ends are pivoted the curved plates  $I I$ , having a curvature concentric with the die  $A'$ . In the normal position of the levers  $G G'$  as held by the springs  $H^6$  and  $H^7$  the two curved plates  $I I$  are held within the upper die  $A'$  with the upper edges of the plates  $I I$  flush with the upper surface of the die  $A'$ , as represented in Fig. 1 of the drawings.

The downward motion of the punches  $E$  and  $E'$ , carrying the blank out from the metal sheet  $D$ , will depress the plates  $I I$ , rocking the levers  $G G'$  upon the gudgeons  $F^2$  and compressing the spiral spring  $H^2$  until the lower edges of the curved plates  $I I$  strike the lower die  $B'$ , thereby limiting the angular movement of the levers  $G G'$  upon the gudgeons  $F^2$ . The continued downward motion of the punch  $E'$  will force the blank whose edges have been turned, as shown in Fig. 4, by its passage by the internal rib  $C'$  between the curved plates  $I I$ , separating them and rocking the levers  $G G'$  upon the pin  $G^3$ , and compressing the spiral springs  $H^7 H^7$ , thereby causing the plates  $I I$  to press against the bent edge of the blank in its passage between the plates as it is carried down upon the die  $B'$  by the downward motion of the punch  $E'$ . As the blank is pressed into the recessed face of the die  $B'$ , it is brought below the lower edges of the curved plates  $I I$ , when the springs  $H^7$  will carry the plates  $I I$  over the edge of the blank as it rests in the lower die  $B'$  and against the sides of the punch  $E'$ . When the punch  $E'$  is carried upward upon its return movement the completed blank and the plates  $I I$  move upward together until the plates  $I I$  are checked in their upward movement by being brought against the under side  $J$  of the rib  $C'$ . In the continued upward movement of the punch  $E^2$  between the plates  $I I$ , said plates act as a stripper to release the completed blank from the upwardly-moving punch  $E'$ . When the punch  $E'$  has been raised, so as to clear the curved plates  $I I$ , the springs  $H^7$  will separate the slotted ends of the levers  $G G'$ , carrying them against the pins  $H^8$  and bringing the curved plates  $I I$  toward each other, so they will pass the rib  $C'$  and be lifted into their normal position, as shown in Fig. 1, by the action of the spiral spring  $H^6$ . Sliding in a bearing  $c$  is a rod  $d$ ,

having a collar  $e$ , and carrying a spiral spring  $f$  placed between the bearing  $c$  and the collar  $e$  by which the collar  $e$  is moved away from the bearing  $c$ . The sliding rod  $d$  is pivoted to the shorter arm  $g$  of a lever which is pivoted upon the lower die at  $h$ , the tension of the spring  $f$  holding the longer and curved arm  $j$  normally in the position indicated by the broken lines  $j'$ . The sliding rod  $d$  is forked at  $k$  and carries a pin or friction-roll  $k'$ , and to the side of the lever  $g'$  is attached a cam-plate  $K$ , which is brought into contact with the roll or pin  $k'$ , thereby sliding the rod  $d$ , pressing the spiral spring  $f$  and moving the curved arm of the lever  $j$  from the position indicated by the broken lines at  $j'$  to the position shown by solid lines at  $j$  in Fig. 2, thereby throwing the completed blank off the surface of the die  $H'$  by the quick angular movement of the pivoted arm  $j$ . When the punches  $E$  and  $E'$  are again depressed, in the operation of stamping the succeeding blank, and the plates  $I I$  are depressed, the cam-plate  $K$  is lifted out of contact with the pin or roll  $k'$  and allows the spiral spring  $f$  to return the curved arm  $j$  to its normal position, as indicated by the broken lines  $j'$ .

The curved plates  $I I$  act as guide-plates to direct the advancing blank from the upper die  $A'$  to the lower die  $B'$ . They also serve to exert a friction upon the edges of the blank to prevent its dropping by its own gravity from the punch  $E'$ , and when the blank has been stamped by the action of the lower die and the punch  $E'$  the curved plates  $I I$  then serve as strippers to strip the finished blank from the ascending punch  $E'$ .

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a die press having upper and lower dies in the same vertical plane and a reciprocating punch, by which a blank is carried through the upper to the lower of said dies, the yielding plates between the upper and lower dies by which friction is applied to the edge of the blank as it is carried from the upper to the lower of said dies, whereby the blank is held from falling by its own gravity in advance of the reciprocating punch, substantially as described.

2. In a die press, the combination with an upper and a lower die and a reciprocating punch passing through said upper die, of a pair of yielding curved plates between which the blank is carried by the action of the punch, said yielding plates having a spring applied thereto to carry said plates against the side of the reciprocating punch in position to strip the blank from the punch on its return movement, substantially as described.

3. In a die press, the combination with an annular die, provided with a rib by which the edge of the blank is turned, of a reciprocating punch passing through said die, yielding plates arranged to close over the blank as it is pushed through said annular die and raised against the sides of said reciprocating punch,

whereby the blank is stripped from the punch on its return movement, substantially as described.

4. In a die press, the combination with an annular die and a reciprocating punch, by which the blank is carried through said annular die, of the curved plates arranged to allow said punch to pass between them, springs by which said plates are pressed against the sides of said punch and an internal rib on said annular die, by which said plates are held from upward movement during the upward movement of the punch, whereby the blank is stripped from the punch, substantially as described.

5. In a die press, the combination with a stationary die and a reciprocating punch, of a pivoted lever arranged to be rocked in one direction by the downward motion of said punch, a spring by which the motion of said rocking lever is reversed, a cam-plate carried by said rocking lever, a sliding bar actuated in one direction by said cam-plate, a spring by which the motion of said sliding bar is reversed, a pivoted clearing lever connected with said

sliding bar, whereby the blank is thrown from the die press, substantially as described.

6. In a die press, the combination of the levers G, G', rocking upon the gudgeons F<sup>2</sup>, and hinged at G<sup>3</sup>, curved plates I, I, pivoted in and carried by said levers, fixed post H<sup>2</sup>, sliding block H', rods H, H, springs H<sup>7</sup>, H<sup>7</sup>, on the rods H, H, and a spring H<sup>6</sup>, on the post H<sup>2</sup>, all combined and operating, substantially as described.

7. In a die press, the combination of the rocking levers G, G', cam-plate K, carried by said levers and actuating a sliding bar in one direction, sliding bar d, spiral spring F, by which the motion of said sliding bar is reversed, pivoted clearing lever j, connected with said sliding bar, all arranged and operating, substantially as described.

Dated at Worcester, in the county of Worcester and State of Massachusetts, this 27th day of June, 1891.

W. A. TURNER.

Witnesses:

RUFUS B. FOWLER,

E. CONVERSE.