

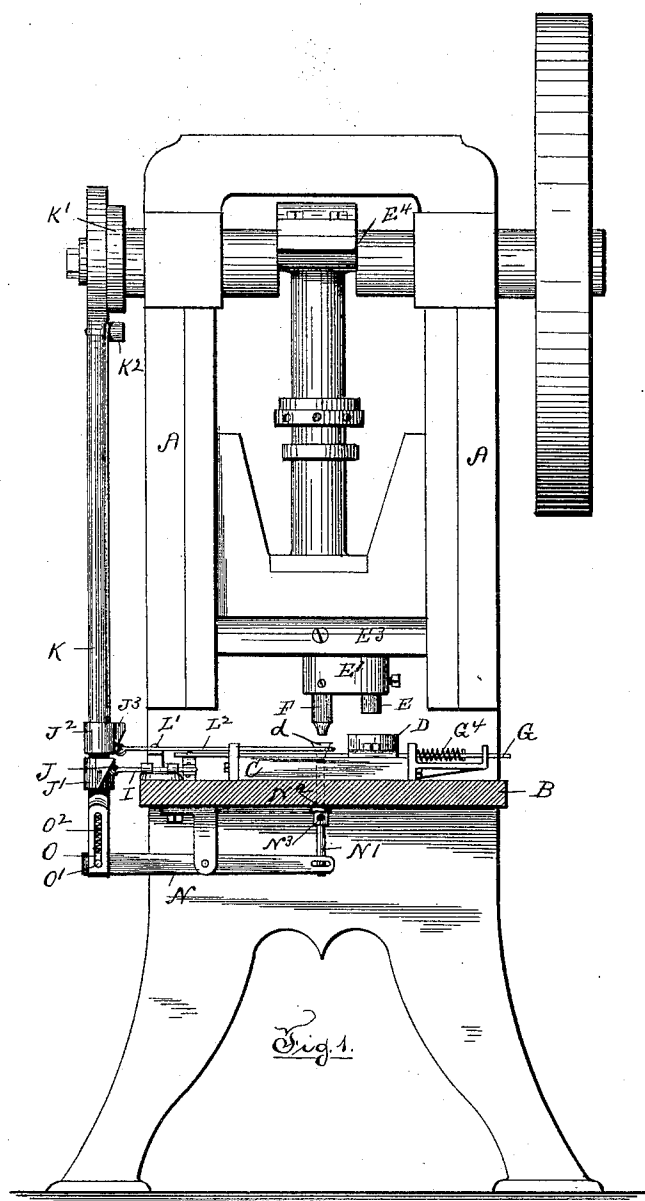
(No Model.)

3 Sheets—Sheet 1.

W. A. TURNER.
DIE PRESS.

No. 451,534.

Patented May 5, 1891.



Witnesses
Walter S. Bowen.
& Corvise

Inventor
William A. Turner
By his Attorney
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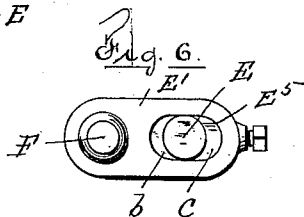
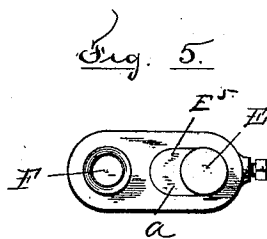
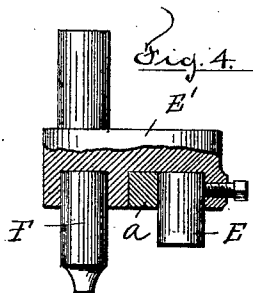
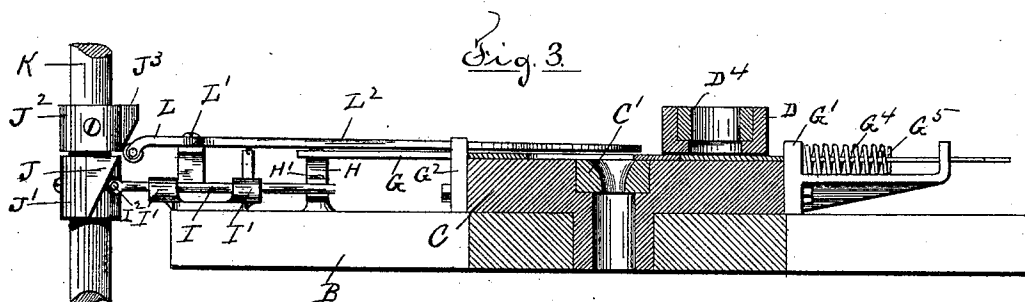
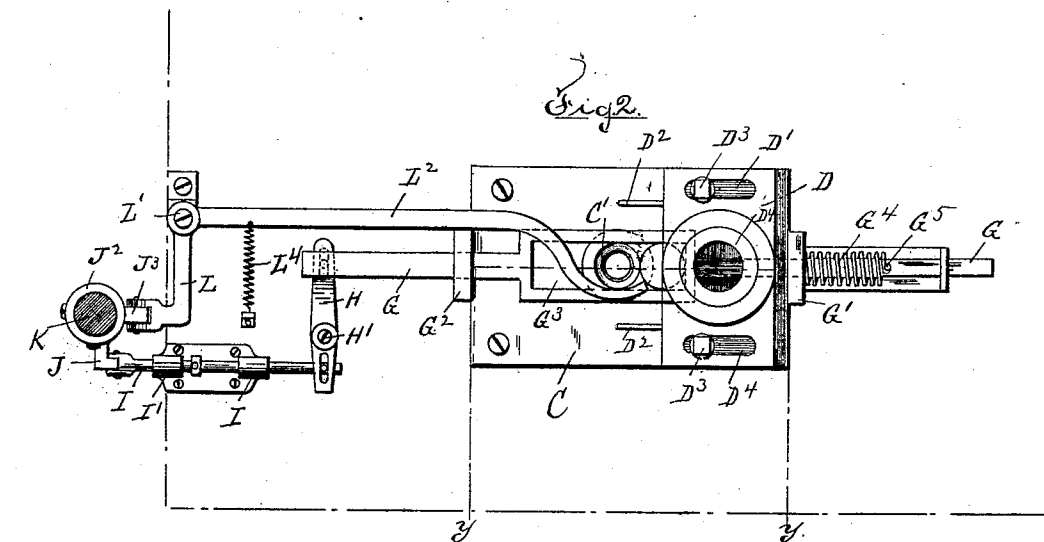
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3 Sheets—Sheet 3.

W. A. TURNER.
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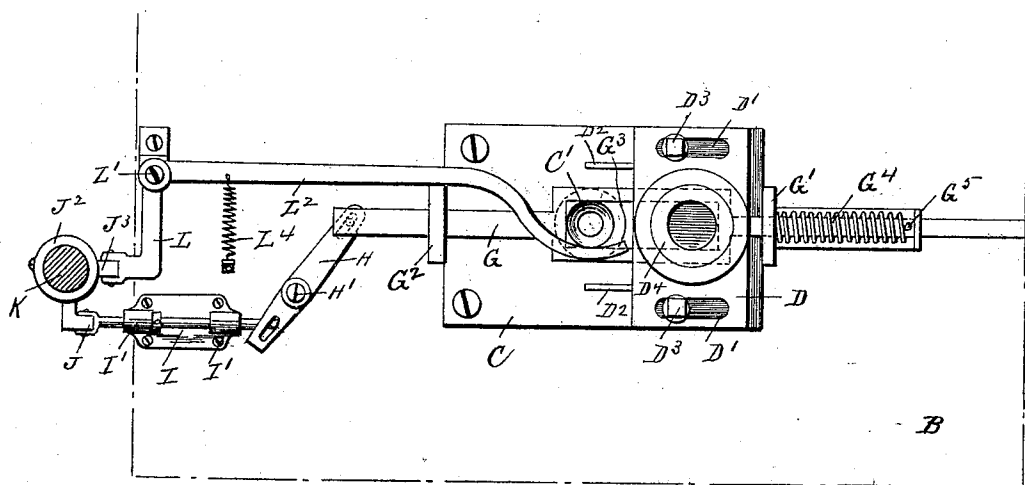


Fig. 7.

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UNITED STATES PATENT OFFICE.

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DIE-PRESS.

SPECIFICATION forming part of Letters Patent No. 451,534, dated May 5, 1891.

Application filed December 9, 1890. Serial No. 374,024. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. TURNER, a citizen of the United States, and a resident of Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in a Die-Press, of which the following is a specification, reference being had to the accompanying drawings, forming a part of the same, and in which—

Figure 1 represents a front elevation of a die-press embodying my invention. Fig. 2 represents a top view of the die-boxes and the devices by which the blank is moved from one of the die-boxes to the other and upon its completion removed from the machine. Fig. 3 is a front view of the parts shown in Fig. 2 with the die-boxes represented in sectional view on line Y Y, Fig. 2. Fig. 4 is a front view of the upper or male dies with the die-holder shown in sectional view. Fig. 5 is a bottom view of the upper or male dies. Fig. 6 is a bottom view of the upper or male dies with the space between them reduced; and Fig. 7 represents the view shown in Fig. 2, but with the operating portions by which a blank is moved from one of the die-boxes to the other shown in a different position.

Similar letters refer to similar parts in the several views.

My invention relates to certain improvements in a single-action die-press by which two operations are simultaneously performed upon the blank and by which the completed blank is removed from the press; and it consists in the arrangement of two die-boxes capable of adjustment so that the distance between the centers of the boxes can be varied in the use of dies or punches co-operating with the dies held in the die-boxes and capable of a corresponding adjustment, and in the arrangement of devices by which a piece of sheet metal, after having been operated upon by one set of dies, is moved into position to be operated upon by a second set of dies and the completed work removed from the press.

In the accompanying drawings, A denotes the frame-work of a single-action die-press of the well-known and ordinary form of construction.

B denotes the table, upon which are mounted the die-boxes C and D, the former resting directly upon the table B and the latter resting upon the box C. The die-box D is provided with the slots D', which allow the box to be moved toward or away from the box C upon the ways D² and fastened in its desired position by the clamping-bolts D³, thereby varying the distance between the centers of the dies held in the die-boxes C and D. The die-box D holds an annular die or ring D⁴, fitting the cylindrical punch E, by which a circular blank is cut from a sheet of sheet metal. The die-box C holds a die C', by which the circular sheet-metal blank cut by the dies D⁴ and E is formed into its desired shape by the action of the upper reciprocating die F.

The upper reciprocating dies E and F are held in a die-holder E', which is provided with a shank E², entering a socket in the head E³, to which a reciprocating motion is imparted by the crank-shaft E⁴ in the usual manner in die-presses of this class.

The die F is held in a socket coincident with the die C', and the die or punch E is held in an oblong recess E⁵ in the die-holder E', and is maintained in its position by bushings a, Fig. 5, and b c, Fig. 6, the bushings being varied to maintain the die E at different distances from the die F to correspond with the distance between the die D⁴ and the die C'. Resting upon and having a sliding motion over the upper surface of the lower die-box C is a plate G, sliding in the guides G' G², and having a rectangular opening G³ to receive the circular blank as it is cut out by the action of the die D⁴ and the reciprocating punch E. During the downward movement of the dies E and F the opening G³ of the sliding plate G is in the position represented in Fig. 7 of the drawings, and as the circular blank is cut from the sheet metal it is forced through the annular die D⁴ into the opening G³, and as the dies E and F move upward the plate G is moved to the left by means of connected actuating mechanism, hereinafter described, carrying the circular blank to the die C' and leaving it concentric therewith, to be pressed into the desired shape at the next downward movement of the reciprocating die

F, when a second circular blank is cut from the sheet metal by the die E. During the downward movement of the dies E and F the plate G is moved back to the position shown in Fig. 7 by the retractile-spring G⁴, acting against the pin G⁵ and the guide G².

The actuating mechanism by which the sliding plate G is moved toward the left in the operation of moving the circular blank from the die D¹ to the die C¹ is represented in plan view in Figs. 2 and 7 of the drawings and in front view in Fig. 3 of the drawings, and it consists of the pivoted lever H, pivoted at H¹ upon the table B, one end of which is connected to the sliding plate G and the opposite end is actuated by the sliding bar I, sliding in ways I¹ I¹ and carrying a friction-roll I², which is acted upon by the inclined edge of the cam-plate J, projecting from a sleeve J¹ attached to the link K, which has a reciprocating motion by means of the cam K¹ acting against a pin K² on the link K. The link is arranged to have a downward motion as the upper dies E and F move up and bring the inclined edge of the cam-plate J against the friction-roll in the end of the sliding bar I, thereby oscillating the pivoted lever and sliding the plate G to the left. Upon the reverse movement of the link K the spring G⁴ will return the plate G to its normal position to receive the next succeeding circular blank as it is cut and forced downward through the die D¹ by the downward motion of the die E.

Placed above the cam-plate J and sleeve J¹ is a second sleeve J² with a projecting cam-plate J³, which upon the downward motion of the link K is brought against a friction-roll carried in the end of the short arm L of a bell-crank lever, which is pivoted at L¹ and which has a long arm L² extending over the lower die-box C, with its end curved to engage the completed blank as it is raised from the die C¹ and push it toward the rear of the press by a short and quick movement of the long arm of the bell-crank as it is actuated by the downward motion of the cam-plate J³. Upon the upward motion of the link K the movement of the bell-crank is reversed by the means of a spring L⁴ and brought into the position represented in Figs. 2 and 7 of the drawings. The link K is connected at its lower end with the pivoted lever N, pivoted to a bracket beneath the table B. The opposite end of the pivoted lever N is connected with a spindle N¹, which slides through a bearing N² beneath the table B and by which it is held concentric with the die C¹. As the link K is moved downward by the action of the cam K¹, the inner end of the pivoted lever is raised, carrying the spindle N¹ upward against the completed blank as it rests in the die C¹, raising the blank into the position as shown at d, Fig. 1, and in position to be acted upon by the long arm L² of the bell-crank. To the spindle N¹ I attach a collar N³, by which the upward motion of the

spindle N¹ is limited, and the link K is provided with a slot O, inclosing a pin or stud O¹ on pivoted lever N, and a spring O², carried by the link K, bears against the end of the lever N, as represented in Fig. 1. When the link K is moved downward, the spindle N¹ is raised until its motion is limited by the collar N³, when the spring O¹ is compressed to allow the continued motion of the link K.

The operation of my improved die-press is as follows: The metal sheet is inserted between the die D¹ and the reciprocating die E, which, upon its downward motion, punches a blank from the sheet and carries it downward upon the upper surface of the lower die-box C and within the rectangular opening G³. Upon the upward movement of the dies E and F the plate G is moved toward the left, carrying the blank over and concentric with the die C¹. The plate G is then returned to its normal position, another blank is fed to the dies D¹ and E, and upon the next downward motion of the dies E and F a second circular blank is carried into the opening G³, and at the same time the first blank is shaped between the dies C¹ and F into the desired form. As the dies E and F are again raised, the spindle N¹ is raised, pushing the blank out of the die C¹ into the position shown at d in Fig. 1 of the drawings, the long arm of the bell-crank lever throws the completed blank toward the rear of the press, the plate G is again moved back and forth, as before, and the operation repeated. At each reciprocating motion of the dies E and F a blank is cut from the metal sheet, and the circular blank so cut is pressed into the shape desired simultaneously with the action of the dies E and D¹.

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

1. In a die-press, the combination, with a pair of stationary dies, of a reciprocating-die holder, a reciprocating die held in a fixed position in said die-holder with its axis coincident with one of said stationary dies, a second reciprocating die adjustably held in said die-holder, and connected means, substantially as described, whereby said die is adjustably fixed in position in said holder with its axis coincident with the axis of the other stationary die, substantially as described.

2. In a die-press, the combination, with a pair of upper reciprocating dies, of a lower stationary die with its axis coincident with the axis of one of said upper dies and a second lower die adjustably fixed with relation to said stationary die, and connected means, substantially as described, whereby the position of said adjustable die is changed to bring its axis coincident with the axis of the other of said upper dies, substantially as described.

3. In a die-press, the combination of a reciprocating-die holder carrying a fixed die and being provided with an oblong socket to receive a second die having a circular shank, and a crescent-shaped bushing around said circular shank, whereby the die is held in a

desired position with reference to the other fixed die, substantially as described.

4. In a die-press, the combination, with two stationary dies placed in different horizontal and vertical planes, of a movable carrier moving in a horizontal plane between said dies, whereby the blank as completed by the upper of said stationary dies is brought into a position coincident with the lower of said stationary dies, and connected operating mechanism, substantially as described, whereby a reciprocating movement is imparted to said carrier, substantially as described.

5. In a die-press, the combination, with a pair of reciprocating dies, of two die-boxes holding stationary dies and placed in different horizontal planes, a sliding plate sliding between said die-boxes and provided with an opening to receive the blank from the upper of the die-boxes, and connected actuating mechanism by which said plate is moved in correspondence with the upward movement of said reciprocating dies, substantially as described.

6. In a die-press, the combination of the stationary-die boxes placed in different horizontal planes, a sliding plate sliding between said boxes and provided with an opening to receive the blank, a cam-plate attached to a reciprocating portion of the mechanism, and connected intermediate actuating mechanism between said reciprocating cam-plate and said sliding plate, substantially as described.

7. In a die-press, the combination, with a pair of stationary-die boxes, of a sliding plate by which the blank is moved from one of said die-boxes to the other, and having connected actuating mechanism by which said plate is moved in one direction and a retractile spring by which the motion of the sliding plate is reversed, substantially as described.

8. In a die-press, the combination, with a stationary die in which a metal blank is shaped, of a bell-crank lever with one of its arms arranged to move over and above said stationary die for the purpose of removing the completed blank, and connected actuating mechanism by which said arm is moved, substantially as described.

9. In a die-press, the combination, with a

stationary-die box, of a bell-crank lever having one of its arms arranged to move over and above said die-box, and a cam-plate attached to a reciprocating part of the operating mechanism and engaging the other arm of said bell-crank lever, by which said bell-crank lever is moved for the purpose of removing the completed blank from said stationary die, substantially as described.

10. In a die-press, the combination, with a stationary die in which the sheet-metal blank is shaped, of a spindle having a reciprocating motion to lift the completed blank from said stationary die, and a pivoted lever capable of an angular movement in a horizontal plane above said stationary die, and connected operating mechanism whereby said pivoted lever and said reciprocating spindle are moved in correspondence to deliver the completed blank from said stationary die, substantially as described.

11. In a die-press, the combination, with a stationary die in which a sheet-metal blank is shaped, of a sliding spindle sliding through said stationary die, by which the completed blank is raised out of said die, a pivoted lever by which said spindle is moved through said die, a stop attached to said spindle to limit its motion as the blank is raised, and connected actuating mechanism having a yielding connection with said pivoted lever, substantially as described.

12. In a die-press, the combination of a pair of stationary dies placed in different horizontal planes, a plate provided with an opening to receive the blank and sliding between said dies, a reciprocating spindle by which the completed blank is raised out of its shaping-die, and a pivoted lever arranged to move the raised blank from the die by its angular movement, and connected actuating mechanism by which said sliding plate, said reciprocating spindle, and said pivoted lever are operated, substantially as described.

Dated the 5th day of December, 1890.

WILLIAM A. TURNER.

Witnesses:

E. CONVERSE,

RUFUS B. FOWLER.