W. J. GORDON.

MACHINES FOR CUTTING AND STAMPING ARTICLES OF SHEET METAL.

No. 184,708. Patented Nov. 28, 1876.

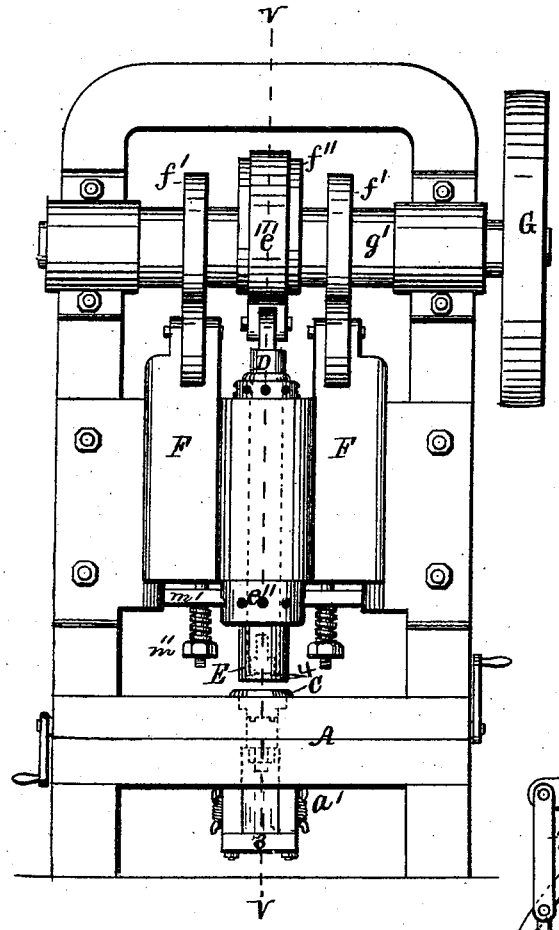


Fig. 1.

Fig. 2.

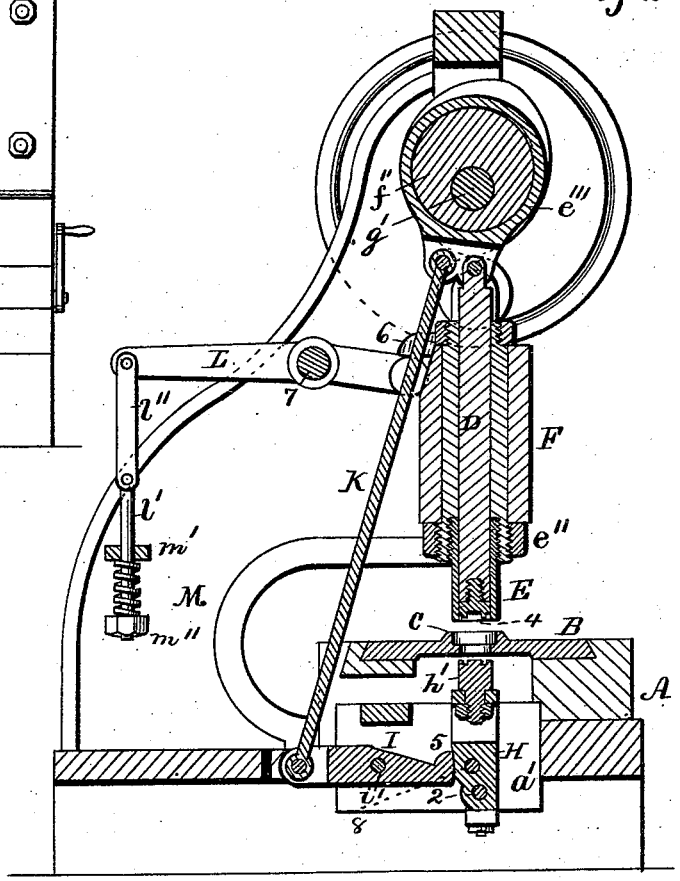
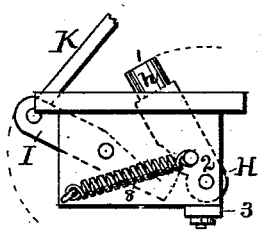


Fig. 3.



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WILLIAM J. GORDON, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN MACHINES FOR CUTTING AND STAMPING ARTICLES OF SHEET METAL.

Specification forming part of Letters Patent No. **184,708**, dated November 28, 1876; application filed October 9, 1876.

To all whom it may concern:

Be it known that I, WILLIAM J. GORDON, of the city of Philadelphia, in the State of Pennsylvania, have invented a new and useful Improvement in Machines for Cutting out, Stamping up, and Embossing Sheet Metal, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation of the machine as when ready for receiving the sheet-metal plate to be operated upon. Fig. 2 is a vertical section of the machine, taken on the dotted line *v v* of Fig. 1; and Fig. 3 is a side view of a portion of the lower part of the sectional Fig. 2, when the anvil is in the tilted position required to let the finished article drop clear of the machine to the floor, upon which the latter rests.

My present invention relates more especially to the machine for cutting out and stamping up sheet-metal boxes for which Letters Patent were granted to me, No. 145,412, dated December 9, 1873; and the object of my present invention is to improve the said patented machine in such a manner as to render it capable of cutting, raising, embossing, stamping, and delivering through the die the finished article at one operation of the machine, as will now be described.

The bed A, slides B, for adjusting and holding the die C, the plunger D, cutter E, and their vertically-sliding carrier F, cams f' f'', the plunger cam and band e''', screw-collars e' e'', and the band-pulley G of the main shaft, are constructed and applied to the main frame of the machine substantially in the same manner shown and described in my said patented machine, and, therefore, need not be more fully described herein, except in so far as it may be requisite to explain my present invention in its relation to any of said parts.

In my present invention the anvil H, carrying the lower embossing-die h', is made to oscillate backward on a cross-pin, 2, into the position shown in Fig. 3, for the purpose of allowing the finished article to drop down upon the floor of the building through a capacious opening, a', and so as to rest firmly down upon a supporting-bar, 3, when in the vertical position for receiving the embossing pressure of the plunger D, which carries a die, 4, that matches with the die h'; and both of these dies are changeable for others at the will of the attendant of the machine. The tilted anvil is forced upward from the inclined position shown in Fig. 3 by means of a lever, I, of the first order, having its fulcrum-pin i' near its mid-length, (see Fig. 2,) and its power end pivoted to the lower end of an inclined rigid bar, K, the upper end of which is pivoted to the block of the band e''', which surrounds the cam f''', fixed on the main shaft g'. The weight end of lever I is curved concentrically to its fulcrum, and is also notched, at 5, on its upper side, as shown in Fig. 2. As the cams f''' and f' f', respectively, move the plunger and cutter D and E, and the carrying-slide F F, downward, the bar K brings the lever I upward into the horizontal position shown in Fig. 2, and thus forces the anvil H from the inclined position shown in Fig. 3 into the vertical position shown in Fig. 1, and holds it in that position firmly until the article under process of construction has been embossed between the dies h' and 4, when the plunger, rising from the action of the cam f'', causes the embossed article, which clings to the lower end of said plunger, to be stripped off by the stationary die C, while at the same time the bar K draws the power end of lever I upward, and releases its cam end from contact with the straight portion of that side of the anvil H, and allows the said anvil, which has a recess for the purpose, to be tilted over backward sufficiently to let the embossed or finished article drop down through the opening a'.

The anvil H is tilted backward, as soon as the lever I releases it for the purpose, by the contraction of a pair of spiral springs, the ends of which are, respectively, attached to the two opposite sides of said anvil, and the corresponding sides of the stationary part a' of the base of the frame A. One of said spiral springs 8 is shown in Fig. 3 as having tilted the anvil backward, and by the dotted line 8 in Fig. 2 as when stretched or elongated by the action of the lever I. On the rear or back part of the slide F there are two lugs cast, one of which, 6, is shown in Fig. 2, and against the under side of each of said lugs a hori-

zontal lever, L, of the first order bears upward by its weight end, its fulcrum being a cross-bar, 7, which bears in the two opposite sides of the upright part of the frame A, while the power end of each of said levers L is strained downward by means of a spiral spring, M, which encircles a vertical rod, l', which slides freely in a stationary cross-bar, m', that keeps the spring M down while the latter is being compressed between it and a burr, m'', on the lower end of the rod l', the upper end of the latter being connected with the power end of lever L by a bar, l''. (See Fig. 2.)

The dies 4 and h' are changeable, and so also is the cutting and forming die C, to suit the style of the articles required to be produced.

The operation of the machine is as follows, viz: The shaft carrying the cams f' f' f'' being put in rapid rotary motion, the operator slips the plate of sheet metal between the dies 4 and C, when separated as in Fig. 1. The cutter E, with its inclosed die 4, by the action of the cam f''', is forced downward upon the sheet metal on the die C, cuts a disk therefrom, and forces the latter down upon the bottom of die C, and immediately after the plunger D forces the disk down through the bottom opening of said die C, and thus turns up the edge of the disk and forces the latter down firmly upon the embossing-die h', thus completing its form; and immediately afterward, the plunger D rising with the finished disk, the die C strips the latter from the plunger. At this period of time the anvil H is released from the lever I by the downward motion of its cam end, and the anvil H tilted backward by the action of the spiral springs 8, as indicated in Fig. 3, and thus allows the finished article to fall freely by gravitation down through the opening at a' to the floor of the room, or into any receiving-box that may be placed for the purpose of receiving the same; and in the meantime the different moving parts of the machine resume their first positions, the cams f' f' forcing the slide F downward, and the spring-levers L raising it upward, and the cam f'' operating the plunger D, and the whole operating together as described. It will be seen, without any further description or explanation, that during each complete rotary motion of the cam-shaft g' a disk of sheet metal will be cut out, raised, embossed, stamped, and delivered through the die C in a complete condition for use.

I claim as my invention—

1. The combination of the reciprocating cutting and stamping dies with the fixed stamping-die and the oscillating anvil, on which it rests, substantially as described.

2. The combination, with the reciprocating cutting-die, the stamping-dies, and oscillating anvil, of the drawing or flanging die, substantially as described.

3. The combination of the anvil H, lever I, and springs 8, constructed and operating substantially as described.

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