

(No Model.)

3 Sheets—Sheet 1.

C. E. RICHARDSON.

APPARATUS FOR FORMING SHEET METAL ARTICLES.

No. 541,456.

Patented June 25, 1895.

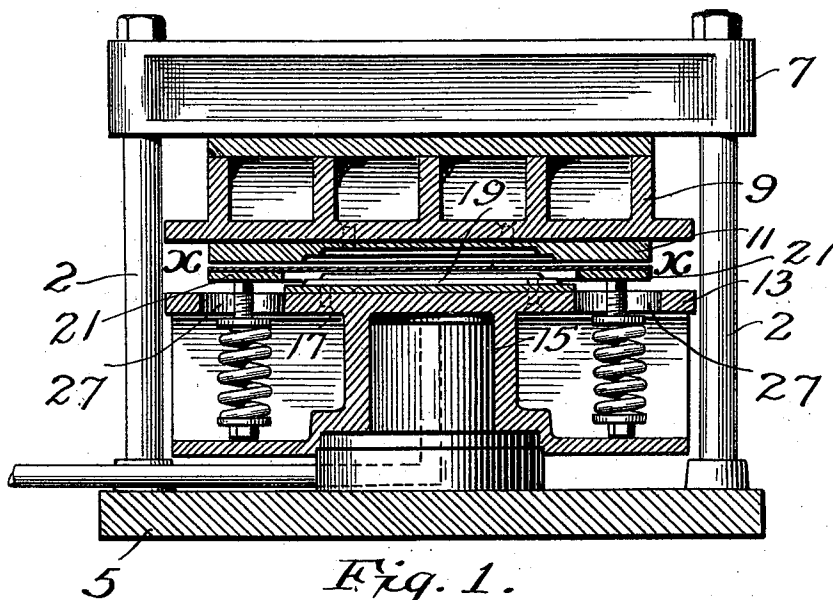
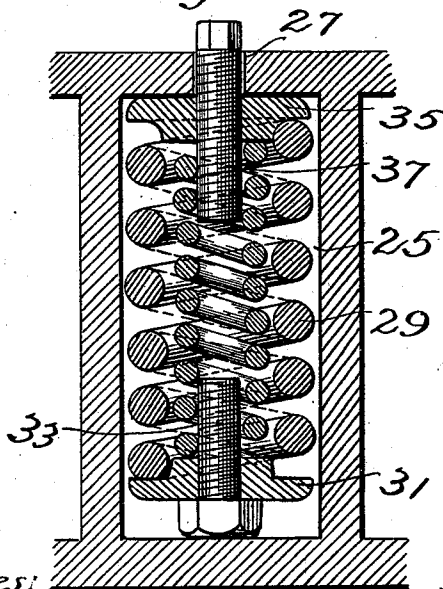


Fig. 1.



Witnesses;

C. E. Van Doras

C. E. Van Doras

Fig. 4.

Inventor;

Charles E. Richardson.

By *Paul Hawley*
his Attorneys.

(No Model.)

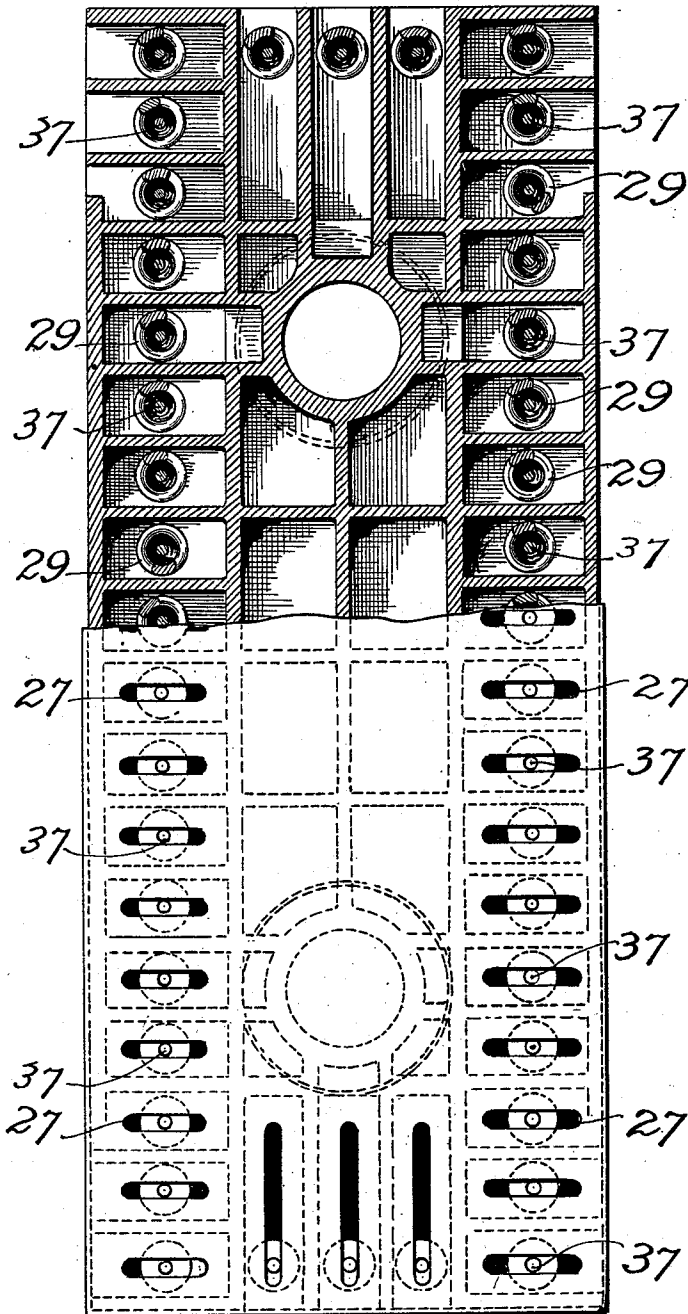
3 Sheets—Sheet 2.

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Witnesses: *Fig. 2.* Inventor;
C. E. Van Dorn, Charles E. Richardson.
C. E. Van Dorn By *Paul Ottaway*
Paul Ottaway his Attorneys

(No Model.)

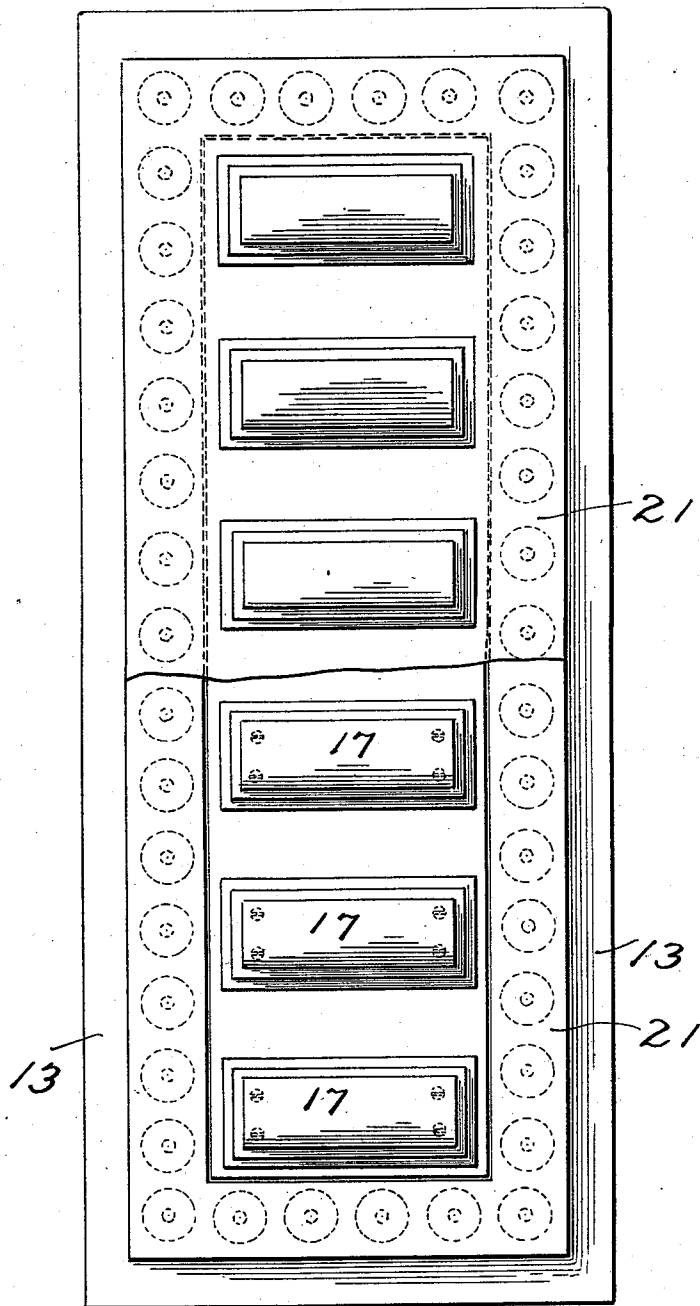
3 Sheets—Sheet 3.

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Witnesses; *Fig. 3.* Inventor;
C. E. Van Dorus Charles E. Richardson.
By *Paul Offawley*
His Attorneys.

UNITED STATES PATENT OFFICE.

CHARLES E. RICHARDSON, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO THE
FIRE-PROOF DOOR COMPANY, OF SAME PLACE.

APPARATUS FOR FORMING SHEET-METAL ARTICLES.

SPECIFICATION forming part of Letters Patent No. 541,456, dated June 25, 1895.

Application filed December 4, 1894. Serial No. 530,783. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. RICHARDSON, of the city of Minneapolis, county of Hennepin, State of Minnesota, have invented a certain new and Improved Apparatus for Forming Sheet-Metal Articles, of which the following is a specification.

The object of my invention is to provide an improved apparatus for forming sheet-metal articles, particularly the sheet metal coverings of fire-proof doors, such as shown in my Patent No. 443,541, granted December 30, 1890.

The invention consists in a press provided with male and female dies and with means for clamping the edge of a sheet of metal, and gradually increasing the pressure thereon as the pressure is increased upon the central portion of the sheet in the act of forming the panels or depressions therein.

The invention consists further in details of construction hereinafter described and particularly pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a transverse vertical section of a press constructed in accordance with my invention. Fig. 2 is a horizontal plan section of the same on line *x x* of Fig. 1. Fig. 3 is a plan view of the lower platen with the die-plate resting thereon. Fig. 4 is a partial vertical section of the lower platen, showing the pockets and the spring mechanism arranged therein.

In the drawings, 2 represents the standards of the press, 5 the bottom or foundation thereof, and 7 the top or cross-pieces to which is secured the upper or stationary platen 9. Upon this platen is secured by bolts or other suitable means a plate 11 constituting the female die of the press, and having a series of depressions therein of the size and shape of those that are to be formed in the sheet of metal to be operated upon. This plate is removable and other plates of the same or different size and having any desired number, shape and arrangement of depressions in them may be substituted therefor.

13 represents the lower or movable platen and this is preferably secured to suitable flanges arranged on the cylinders 15, suitable pipes being connected to said cylinders so

that said flanges and platen may be moved by hydraulic or steam pressure. The male die plate 17 provided with a series of elevations 19 is arranged to be bolted or otherwise secured upon said lower platen 13. This die plate is made to correspond and the projections thereon also correspond to the female die with which it is used. The die plate 17 does not extend the full length or width of the lower platen 13, and a follower 21 of the same thickness as said lower or male die-plate is arranged outside of said die plate upon said lower platen. The upper die plate may be the full length or width of the upper platen, or it may be of less length and width, as shown in Fig. 1.

The lower platen is provided all around its edges with a series of laterally opening pockets 25, extending into said platen, and slots 27 provided in the upper surface of said platen extending into said pocket. Arranged in each of said pockets is a spring or springs 29, the lower end of said springs resting upon a washer 31 that is secured upon a threaded bolt 33, the head of said bolt resting upon the bottom of said pocket. Upon the upper ends of said springs and preferably secured thereto is a cap or washer 35 through which extends a threaded pin or bolt 37, the upper end of said pin extending through the slot 27 above the surface of the platen. The upper end of said pin is made polygonal and by applying the wrench thereto and also to the head of the bolt the pin may be raised or lowered as desired, turning in said washer. The washers 31 and 35 are so connected to the ends of the springs that the pin 27 may be raised or lowered without turning the washers. The follower plate 21 rests upon the upper ends of the pins 37, and said follower is preferably made in the shape of a rectangular frame, as shown in Fig. 2. When it is desired to use a narrower or shorter die-plate the springs are moved inward in the pockets 25, the pins 37 sliding in the slots 27 and a smaller follower is placed upon said pins. The upper end of said pin is made square, and by applying a wrench thereto and also to the head of the pin through the pocket in the side of the lower platen, said pin may be raised or lowered screwing in said washer. The reference nu-

meral 25 is shown in Fig. 4. The follower 21 rests upon the upper ends of the pins 37 and said follower is preferably made in the shape of a rectangular frame as shown in Fig. 3. When it is desired to use a narrower or shorter die-plate the springs are moved inward in the pockets 25, the pins 37 sliding in the slots 27 and a smaller follower is placed upon said pins.

10 In using the machine a plate of metal, such as steel, or other suitable material, is placed upon the lower platen of the press with its edges resting upon the follower 21, suitable dies having been applied to the press corresponding to the design that it is desired to press or form in the sheet of metal. In some instances it will be desired to form the covering for a panel door such as that shown in my patent hereinbefore referred to, in which case 15 the male and female dies will have the proper depressions and elevations to form a series of panels of the desired form for each side of the door. Upon applying power to the press the lower platen is raised and the edges of 20 the sheet of metal are clamped with a yielding pressure between the follower and the upper platen. A further movement increases the pressure upon the plate and the male die striking upon the plate forces the central portion 25 into the depression in the female die. As the springs are compressed the pressure exerted by the follower becomes greater and greater until finally the springs are sufficiently depressed so that the follower also rests upon 30 the face of the platen, at which time the plunger will have completed its movement and the male die will have been brought into correspondence with the female die. The plate is so firmly clamped between the follower and 35 the upper platen that no inward movement thereof is permitted, and hence the depressions are formed in the plate by drawing or pressing the metal and not by moving it inward from its edges. The edges of the plates, 40 that is those parts between the follower and the upper platen, remain perfectly smooth and do not move at all during the pressing operation.

By this described method and means of 50 stamping or forming the articles, I am enabled to provide metal coverings for doors of any size, having any desired number of panels or other designs formed therein, while the part of the metal not pressed into the panel 55 remains perfectly smooth.

I claim as my invention—

1. The combination, with a stationary platen, the movable platen, dies fixed upon

said platens and arranged to co-operate with each other, and a spring supported follower 60 surrounding the die plate upon said movable platen and arranged to clamp a sheet of metal at or near its edges between said follower and the stationary platen with a yielding pressure, before the dies begin to press the metal, 65 and the springs supporting said follower being laterally adjustable, substantially as described.

2. The combination, with the fixed and movable platen, the dies arranged thereon, of the 70 spring supported follower surrounding the die upon said movable platen, said movable platen being adapted to support followers of different dimensions, substantially as described. 75

3. The combination, with the stationary platen, the die arranged thereon, the movable platen the die arranged thereon, said movable platen being provided with a series of pockets arranged in its edge, laterally adjustable 80 springs arranged in said pockets, and a follower supported upon said springs and surrounding the die upon said movable platen, substantially as described.

4. The combination, with the stationary 85 platen, the die arranged thereon, the movable platen, the die arranged thereon said movable platen being provided with a series of pockets, and with a series of slots in its upper surface communicating with said pockets, 90 springs arranged in said pockets, pins supported by said springs and extending through said slots, and a follower supported upon said pins.

5. The combination, with the stationary 95 platen, the die supported thereon, the movable platen, the die supported thereon, said movable platen being provided with a series of pins, a series of pockets in its outer edge, springs arranged in said pockets, said pins 100 supported by said springs and extending through slots in the upper surface of said platen, means for adjusting the tension of said springs, means for permitting the adjustment of said pins, and a suitable follower 105 surrounding the die upon said movable platen and supported upon said pins, for the purpose set forth.

In testimony whereof I have hereunto set my hand this 21st day of November, A. D. 110 1894.

CHARLES E. RICHARDSON.

In presence of—

A. C. PAUL,
M. E. GOOLEY.