

(No Model.)

F. EGGE.
METAL WORKING TOOL.

No. 604,376.

Patented May 24, 1898.

Fig-III

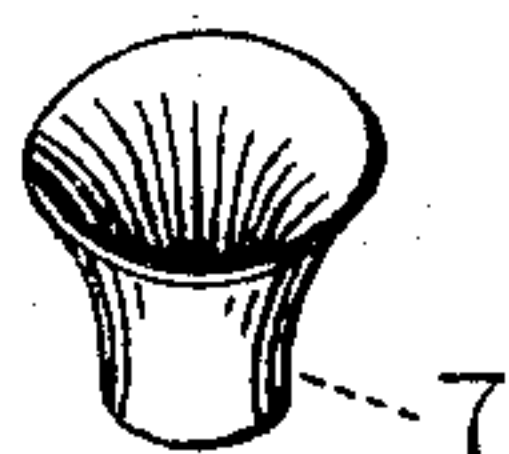


Fig-I

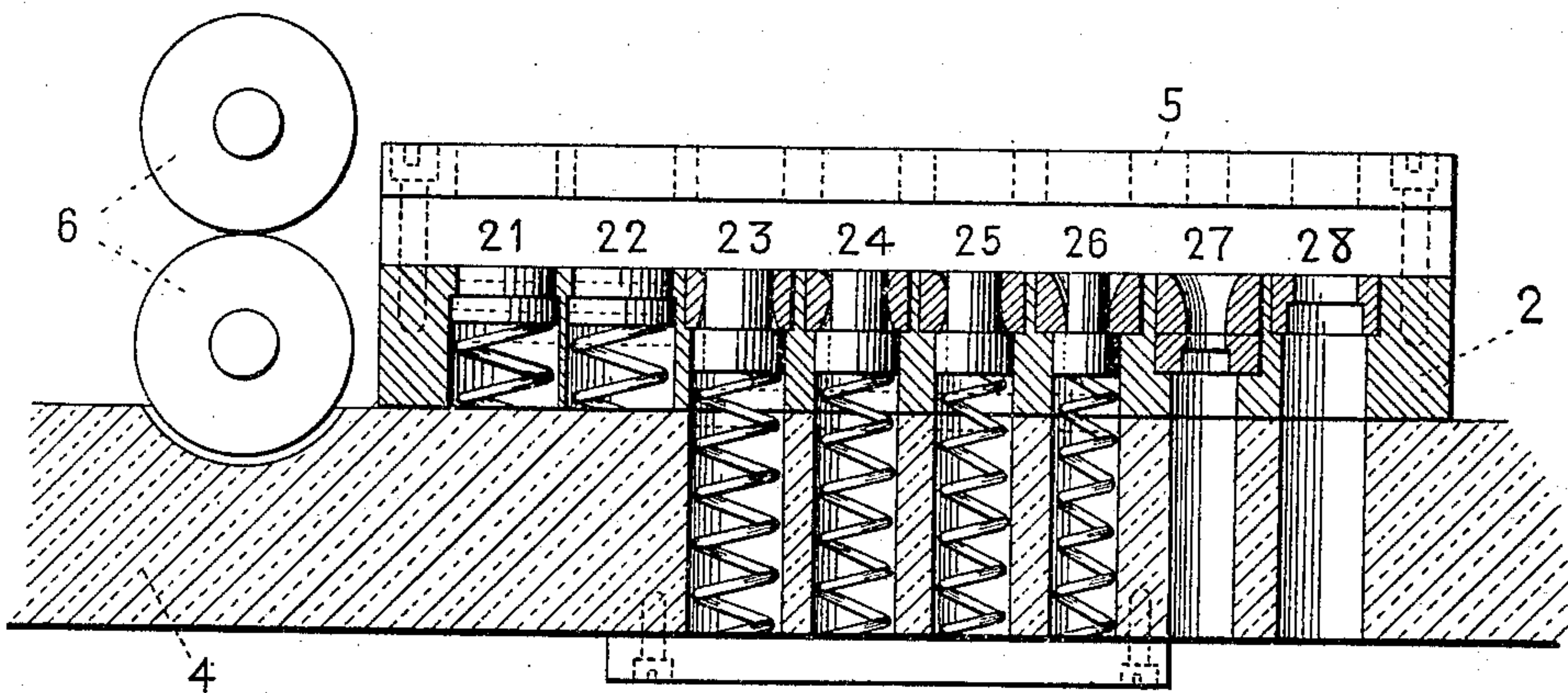
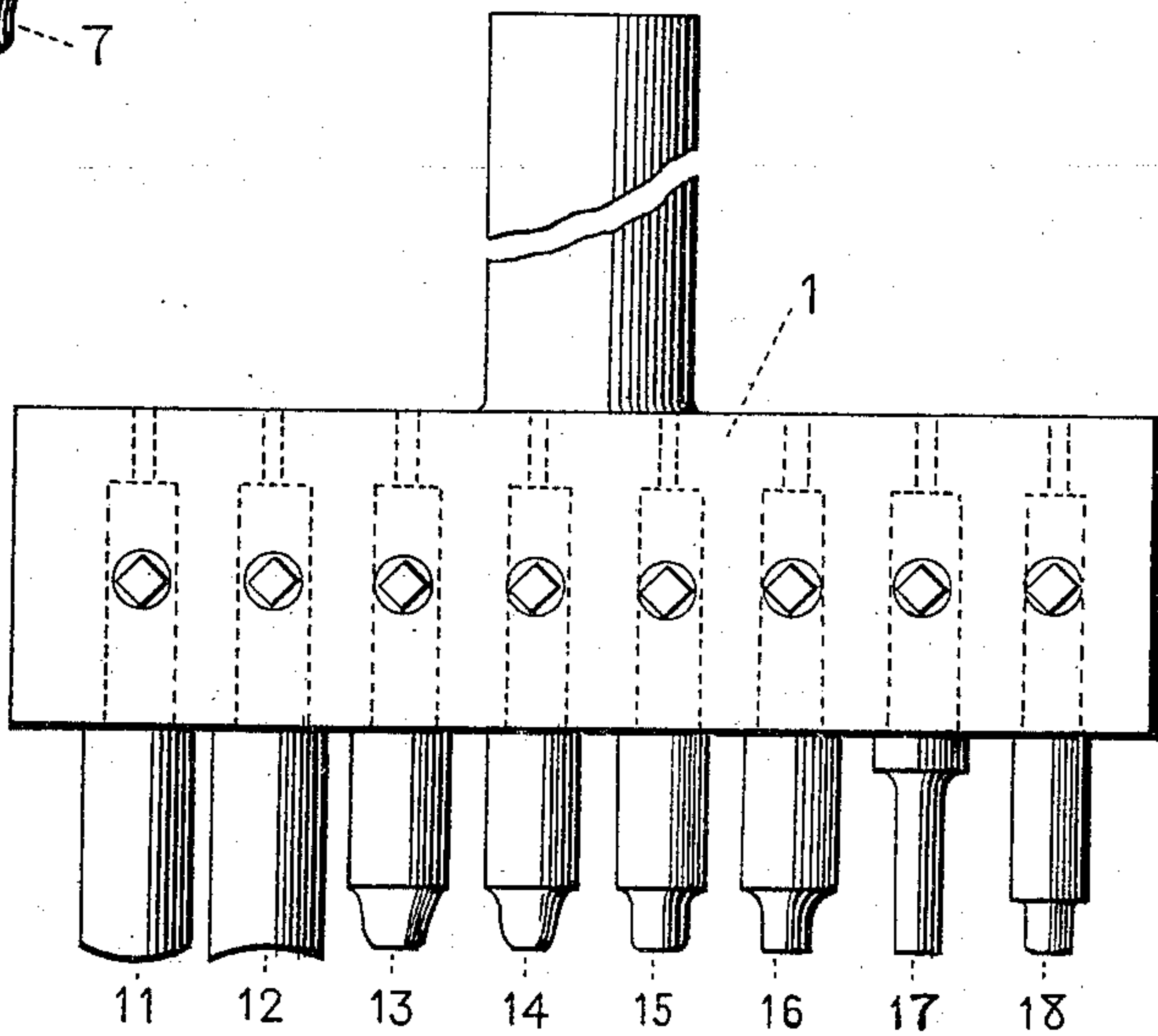


Fig-II

WITNESSES:

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UNITED STATES PATENT OFFICE

FREDERICK EGGE, OF BRIDGEPORT, CONNECTICUT.

METAL-WORKING TOOL.

SPECIFICATION forming part of Letters Patent No. 604,376, dated May 24, 1898.

Application filed July 17, 1897. Serial No. 644,969. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK EGGE, a citizen of the United States, residing at Bridgeport, Connecticut, have invented a new and useful Improvement in Sheet-Metal Blanking and Forming Tools, of which the following is a specification.

My invention relates to that class of metal-working tools in which a series of operations is successively performed upon a given portion of the metal before it is separated from the remainder. It is intended to provide a combination-tool adapted to the continuous automatic or semi-automatic production of finished or nearly-finished articles of metal or the like.

In the accompanying drawings, Figure I represents, partly in elevation and partly in vertical section, a form of my device. Fig. II is a top plan view of a metal strip, showing the operations. Fig. III, in enlarged perspective, shows the finished product.

1 designates a force-holder adapted to hold punches or forces 11 12 13 14 15 16 17 18; 2, a die-holder provided with dies 21 22 23 24 25 26 27 28; 3, a metal strip showing at 31 32 33 34 35 36 37 38 the successive operations to which it has been subjected; 4, a die-bed; 5, a stripper; 6, feed-rolls, and 7 a finished shell.

In the example of my invention illustrated in the drawings the force-holder 1 is provided with the usual shank by which it may be secured in a press of any well-known type. As shown, it is also drilled for the reception of four punches 11 12 17 18 and four forces 13 14 15 16 and the ordinary bolts by which they are held in position. Secured to the die-bed 4 in any convenient manner is the die-holder 2, in which are cut the die-apertures 21 22 and in which are inserted the dies 23 to 28, inclusive. A metal strip 3 of indefinite length is fed between the feed-rolls 6 under the stripper 5, and from it are formed and cut the shells 7. Suitable guides for the metal strip are provided as required, and a second pair of feed-rolls (not shown) may be attached at the exit ends of the dies to assist in carrying forward the metal and to dispose of the scrap. The action of the separate forces and dies of the device will now be considered. It is of course first understood that the motion of the feed-rolls 6 is intermittent

and so as to advance the strip 3 after each stroke of the press a distance equal to the diametric distance between any two of the punches, as 11 and 12. It is evident that at the first stroke of the press after the strip 3 is in place the coaction of the punch 11 and the die 21 will cut near the forward end of the strip a pair of arc-like incisions through the metal, as shown at 31. At the next stroke, the metal being fed forward one space, the parts 12 and 22 will cut a transverse pair of arc-like incisions through the metal within and near the first pair, as shown at 32. At the same time the parts 11 and 21 are repeating their operation one space back of where they first cut the strip. At the third stroke these operations are repeated each one space behind the last similar one, while the drawing-force 13 forces the partly-loosened blank down into the die 23, thereby giving it the cup-like form shown at 33. This cup is further successively shaped by the coacting parts 14 24, 15 25, and 16 26, as shown at 34, 35, and 36, respectively. The first cup then has its bottom pierced out by the punch 17 and die 27, and, lastly, the shell 7 is produced by the trimming-punch 18 and die 28 cutting it from the surrounding metal, as shown at 38.

It is obvious that at every stroke of the press after the seventh a shell 7 will be produced, and that the action is automatic, in that no further attention is required until the strip 3 is exhausted, when it is only necessary to replace it.

I do not wish to be limited in the application of my device to the number or form of punches, forces, and dies shown. The series of drawing operations in dies 23 to 26 may be diminished or increased in number according to the ductility of the metal operated upon or the complexity of the article to be produced. In many cases no piercing-die, as 27, is required. It is also clear that many mechanical alterations may be made, as in the matter of feeding or in other parts of my device.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is as follows:

1. In a reciprocating tool for simultaneously performing a series of operations on a

strip of metal or the like, means, substantially as described, for incising the metal so as to partially detach from the strip a portion of metal larger than the base of the finished article.

2. In a tool for simultaneously performing a series of operations on a strip of metal or the like a reciprocating cutting-die adapted to produce a plurality of incisions in the metal whereby a portion of metal larger than the base of the finished article is partially detached from the strip, substantially as described.

3. In a tool for simultaneously performing a series of operations on a strip of metal or the like a plurality of reciprocating cutting-dies each adapted to produce an incision, one

or more, in the metal whereby a portion of metal larger than the base of the finished article is partially detached from the strip, substantially as described.

4. In a tool for simultaneously performing a series of operations on a strip of metal or the like two reciprocating cutting-dies each adapted to produce a pair of opposite curved incisions in the metal the chords of the curves of the second pair of said incisions being substantially at a right angle with those of the first pair, substantially as described.

FREDERICK EGGE.

Witnesses:

GEO. L. COOPER,
C. R. AYRES.