(No Model.) 3 Sheets—Sheet 1.

G. S. SHIMER.

MACHINE FOR MAKING METAL WASHERS.

No. 456,441. Patented July 21, 1891.

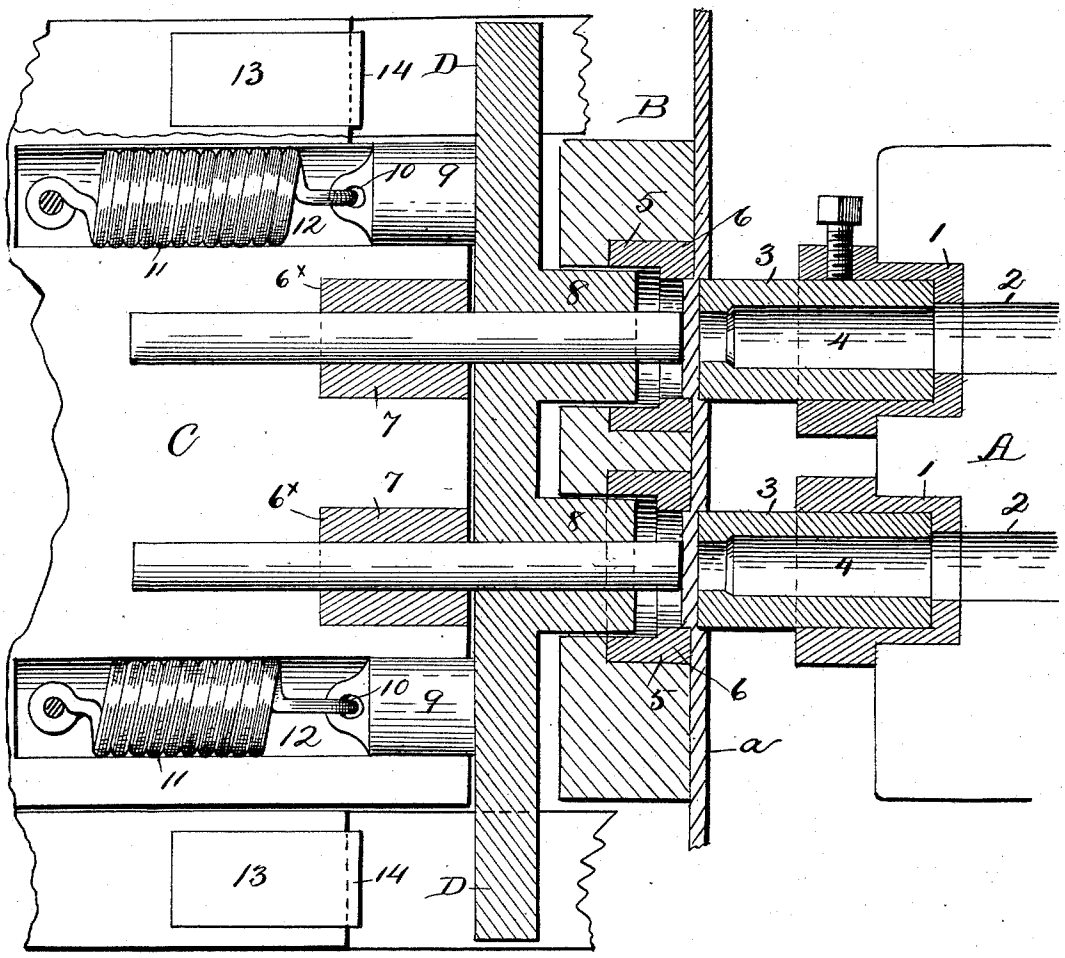


Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

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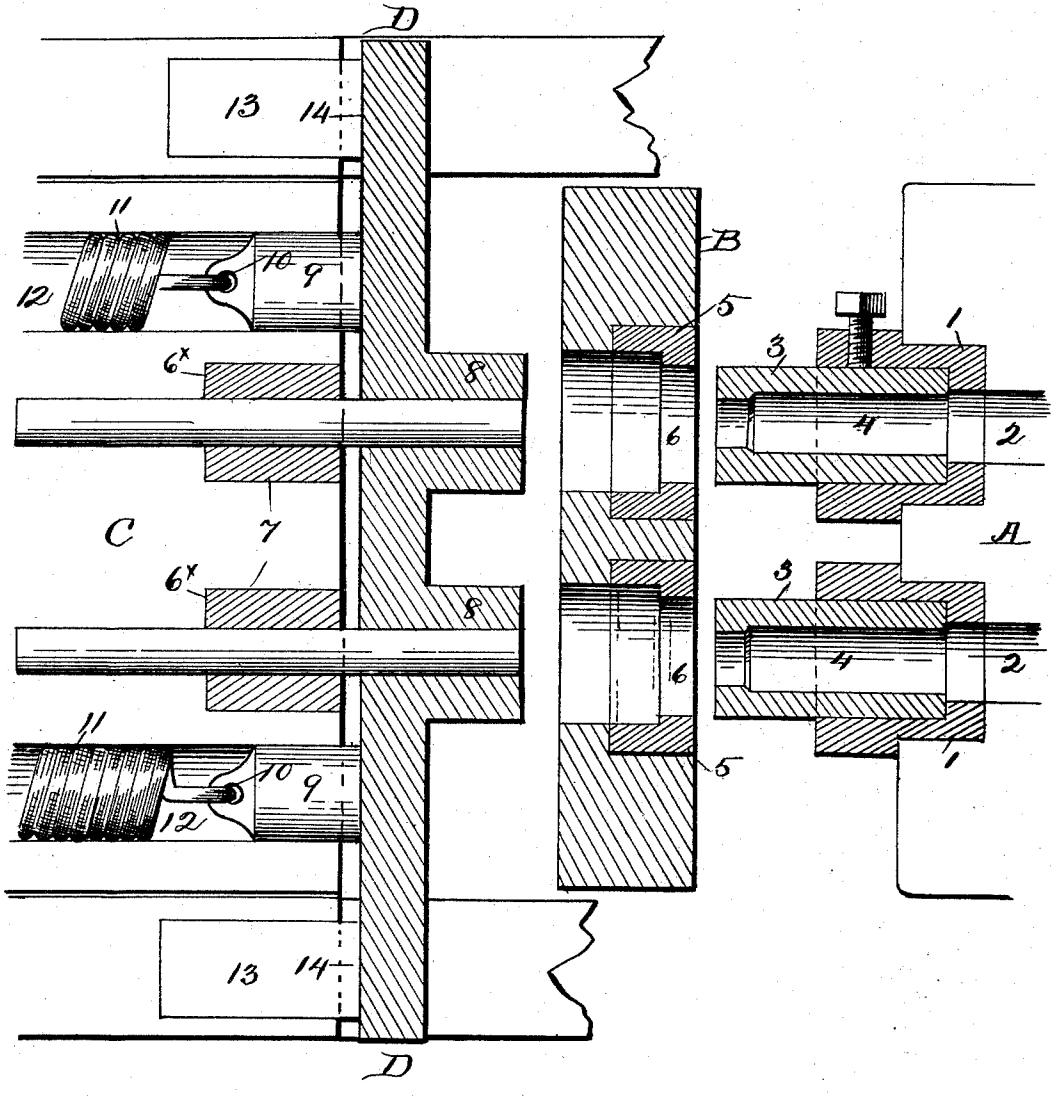


Fig. 2.

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(No Model.) 3 Sheets—Sheet 3.

G. S. SHIMER.

MACHINE FOR MAKING METAL WASHERS.

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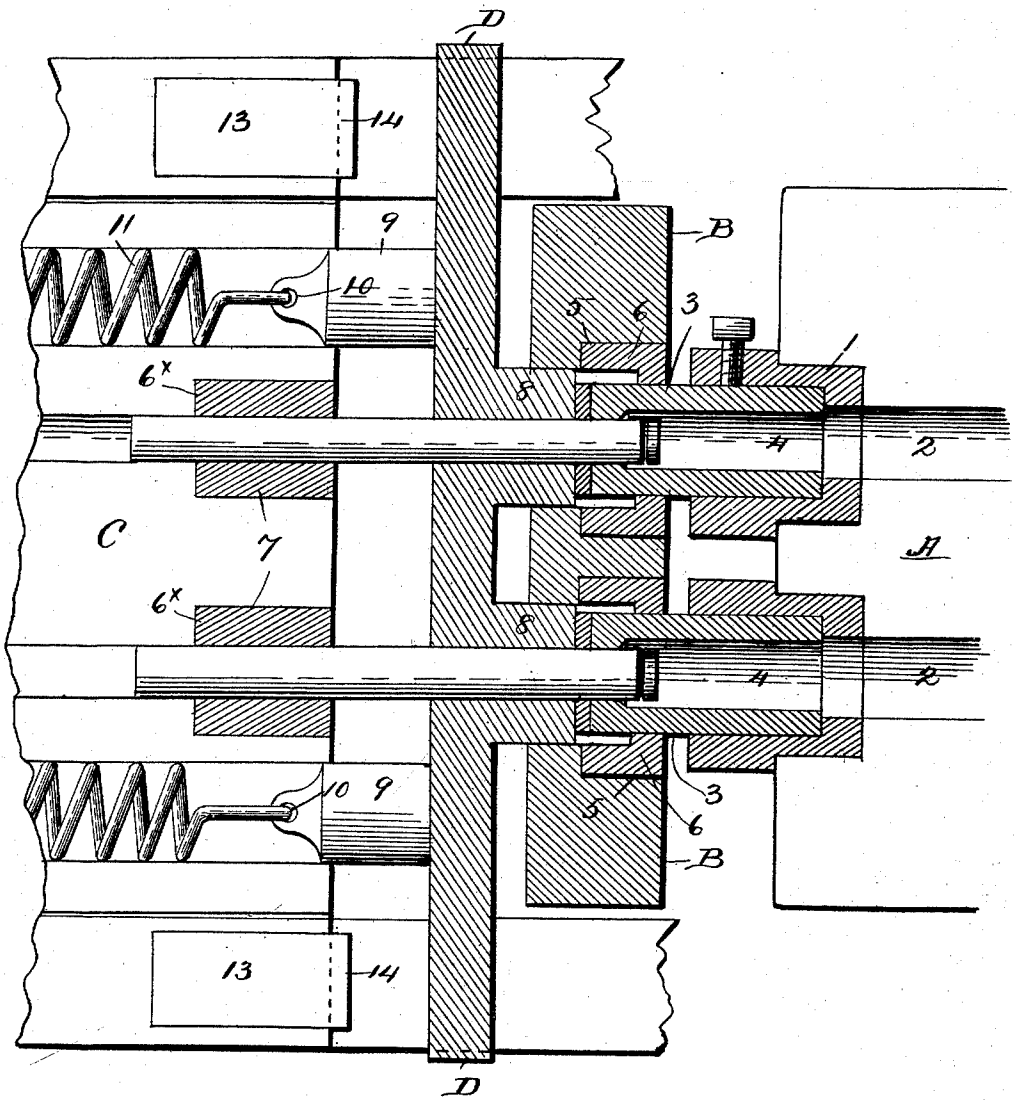


Fig. 3.

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UNITED STATES PATENT OFFICE.

GEORGE S. SHIMER, OF MILTON, PENNSYLVANIA.

MACHINE FOR MAKING METAL WASHERS.

SPECIFICATION forming part of Letters Patent No. 456,441, dated July 21, 1891.

Application filed February 26, 1891. Serial No 382,931. (No model.)

To all whom it may concern:

Be it known that I, GEORGE S. SHIMER, a citizen of the United States of America, residing at Milton, in the county of Northumberland and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Making Metal Washers, of which the following is a specification.

My invention relates to improvements in machines for making metal washers wherein the washers are punched from a plate or bar by means of washer-cutting punches and center punches.

I have fully and clearly illustrated my invention in the accompanying drawings, wherein—

Figure 1 is a view, partly in transverse and longitudinal section, showing my invention applied and showing the washer started by the washer-punch and being engaged by the center punch. Fig. 2 is a similar view showing the punches and the "stripper" carried to their back limits. In this view the inward limit of movements of the respective punches is shown by dotted lines. Fig. 3 is another view showing the washer-punch moved to its inward limit, the center punch started in its return movement and the stripper in position to operate when the center punch with the washer thereon is withdrawn.

It will be premised that the invention is especially adapted for connection to horizontally-moving punch-heads and punches. The punch blocks or heads may be of any construction suitable to effect conjuncture of the punches, and because of this I have not deemed it essential to illustrate the reciprocating rams or punch-blocks, except to that part immediately in connection with the punches.

The present invention is another means of carrying out my invention shown and described in my earlier application, filed December 1, 1890, Serial No. 373,224.

Referring to the drawings, A designates the punch-block of the washer-punches, having punch-seats 1 and center-clipping discharges 2. In the punch-seats are secured the washer-punches 3 of such size as may be desired, and having a center bore 4 of the center-punch size at the punching end, and preferably enlarged at the rear to permit easy discharge of the center chips. The number of the punches may be as desired, the head-stock being widened to such size as required to take the additional number of punches.

B designates the die-bed, having formed therein the die-seats 5, in which are disposed and secured the dies 6. The die-bed is secured across the space between the dies by any proper means, and at the relative proper position to take the strike of the washer-punches and the return-stroke of the center punches.

C designates the punch stock or head carrying the center punch or punches. The cast metal of the punch-stock being unable to withstand the strains and wear put on it, seats $6^{\times}$ are formed in its end face, in which steel bushings 7 are arranged, and in the bore of this bushing the center punch is arranged, as shown, and secured by means of a set-screw, the rear end of the punch abutting against the end of the bore in the punch-head.

D designates the reciprocating stripper and center-punch support. This consists of a substantial plate of metal, suitably supported at its ends, and formed with projections or bearing-pieces 8, which enter the neck of the die and engage the washer when it is drawn back by the center punch. The neck of the die is preferably made larger than the mouth or cutting portion, and the projection 8 fits the neck and slides therein. Projected from the rear face of the stripper-plate and punch-support are lugs or bearings 9, having holes 10 in their ends, in which one end of a retracting-spring 11 is fastened, the other end of the spring being secured at the rear of seats 12, formed in the punch-head substantially as shown in Fig. 1 of the drawings. The lugs or bearings 9 serve as guides and supports to maintain the stripper in direct and uniform position in its movements and to direct it in its engagement with the die-neck.

To prevent the jar otherwise attending the return of the stripper and punch-support, stop-blocks 13 are secured on the machine frame or bed, and on the end face adjacent to the stripper-plate are cushions 14, against which the stripper impacts when returned by the springs. It will be perceived from the foregoing and by reference to the drawings that

in any position the plate D may be placed it operates as a support, strengthening element, and steadier to the projecting portion of the center punches, and thus insures, to a great extent, the punch against breaking.

It will be seen by reference to Fig. 2 of the drawings that when the coacting elements of the punches and the stripper are removed to their outward limit from the die-bed the die is clear and unobstructed, the cut washer having before the elements reached this point or relation been stripped from the center punch and discharged through the opening. It will also be perceived by reference to Fig. 1 of the drawings that the washer-punch engages the plate from which the washers are cut before the center punch enters the metal. Generally the cutting or punching engagements of the punches have heretofore been made simultaneously on opposite sides of the plate. This engagement is attended with a great and annoying noise and jar at impact, which is removed and avoided by the successive engagement of the punches, as illustrated in the drawings and as stated in the purview of the description of the operation, which, with the exception of the mode of operation of the reciprocating stripper and center-punch support, is the same as that specified in my former cited application, and may be here rehearsed as follows: The plate *a*, from which the washer is made, is fed between the die-bed and the washer-punches, and the washer-punches, coming up slightly in advance of the center punches, first engage the plate and start the washer, as seen in Fig. 1 of the drawings. Just after the action is accomplished the center punch engages the opposite surface of the plate, as indicated in Fig. 1, which engagement being attained the washer-punch continues to farther advance, and both punches then advance, the washer-punch forcing the washer through the die and on the center punch. Just before or at the time the washer-punch has reached its limit of forward movement the center punch has begun to recede. The head or punch-stock of the center punches pushes the punches through the stripper, and as it advances the end face abuts or contacts with the stripper and carries the latter forward until it enters the die-neck and receives the impact of the washer, after which the head or punch-block, with the center punches, begins to recede, carrying the washer near the end of the center-punch and drawing the stripper with it until it reaches the abutting blocks, when the punch-block and center punch are carried still farther back until the end of the center punch is flush with or just within the face of the stripper, as shown in Fig. 2, and the washer drops off.

Having thus described my invention and explained its principles and mode of operation, so as to distinguish it from other inventions in the art, I now proceed to particularly point out and distinctly claim the part, improvement, and combinations which I claim as my invention, to wit:

1. In a machine for making metal washers, a reciprocating stripper-plate formed with center punch apertures in alignment with the bore of the die and adapted to serve as supports for the center punches, substantially as and for the purposes specified.

2. In a machine for making metal washers, a reciprocating stripping and steadying plate, formed with projecting portions to enter the neck of the die, and having apertures through the plate and projections to take and support the center punches, substantially as and for the purposes specified.

3. In a machine for making metal washers, the combination, with the center punches and the die having a neck-bore larger than the mouth-bore, of a reciprocating stripper-plate having projections to enter the neck of the dies and apertures through the plate, and projections to receive and support the punches, substantially as described.

4. In a machine for making metal washers, the combination of a punch-block and the punches therein, a reciprocating stripper-plate having projections to enter the bore of the die and holes through the plate and projections, a die formed to receive the projections of the stripper-plate when advanced, and means to return the plate to its backward position, as specified.

5. In combination, the reciprocating stripper-plate and punch-support D, having apertures therein in alignment with the center punches, the center punches arranged in said apertures, and yielding abutting blocks to stop the stripper-plate slightly short of the backward movement of the punches, whereby the washer is thrown entirely clear of the punch, substantially as described.

6. In combination with center punches, a movable stripper and steadying plate D, having projections thereon and apertures therein to take the center punches, and a die having a bore to receive and guide the projection on the stripper-plate, as described.

7. In a machine for making metal washers, a shifting stripper and steady-rest having bearings arranged to enter the socket of the die and apertures through the bearings, the center punches in the said bearings, means to stop the stripper and steady-rest before the center punch reaches its limit of backward movement, substantially as described, and for the purpose specified.

8. In a machine for making metal washers, the combination, with the reciprocating washer-punch stock, the die having a socket larger than its mouth, the stripper-plate having projections to enter the die-socket and apertures through the plate and projections, and the center-punch stock having the punches arranged in the bearings or apertures of the stripper-plate, substantially as described.

9. The combination, with the center-punch stock formed with seats in its outer portions

and the center punches in the stock, of a stripper-plate having the punches projected through it and arranged to be moved forwardly by the punch-stock, and springs in the seats in the stock to return the stripper to its normal position, substantially as described.

10. The combination, with the center-punch stock formed with seats, as 12, the center punches, and the die, of a reciprocating stripper-plate and punch-support D, formed with bearings to fit the seats 12, and forward projections having apertures to receive the punches and adapted to engage and enter the rear end of the die, as specified.

11. The combination, with the reciprocating punch-stock and punches, a stripper-plate on the punches, and means for reciprocating the stripper-plate, of yielding stops on the frame of the machine to stop the backward movement of the stripper-plate, as described.

In witness whereof I have hereto set my hand in the presence of two attesting witnesses.

GEORGE S. SHIMER.

Attest:
EDWARD P. HILL,
W. H. BECK.