(No Model.)

J. ETTINGER.

MACHINE FOR MAKING WASHERS.

No. 457,951. Patented Aug. 18, 1891.

Fig. 1.

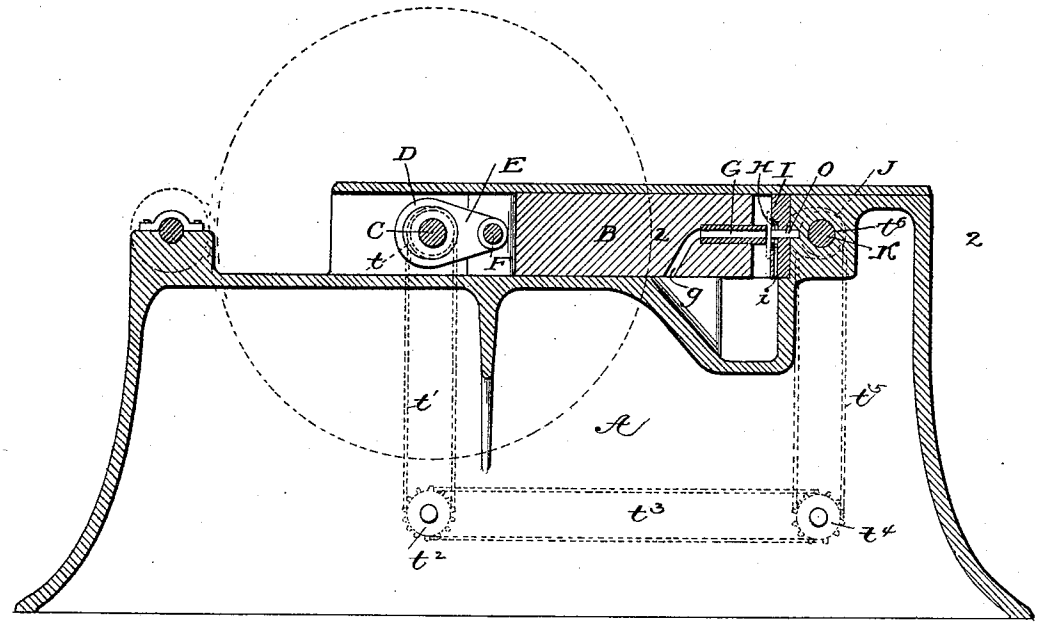


Fig. 2.
on line 2-2

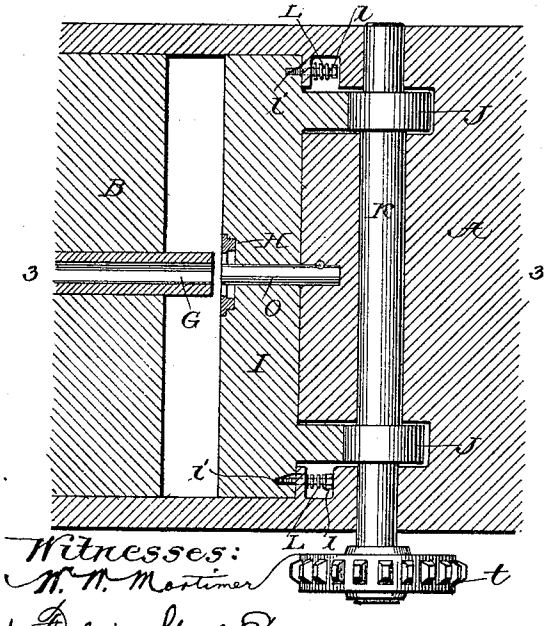


Fig. 3.
on line 3-3

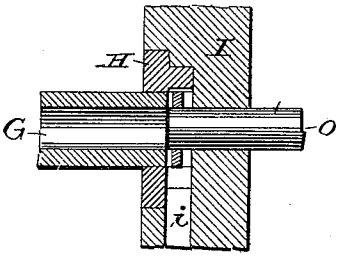
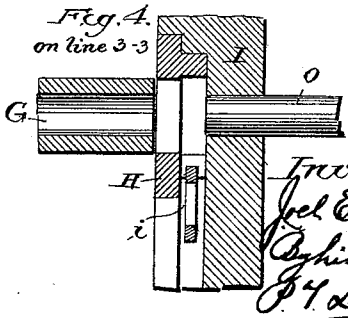


Fig. 4.
on line 3-3



Witnesses:
W. W. Mortimer
Fabius Stanly Elmore.

Inventor:
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By his Att'y
F. Y. Dodge

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOEL ETTINGER, OF MILTON, PENNSYLVANIA.

MACHINE FOR MAKING WASHERS.

SPECIFICATION forming part of Letters Patent No. 457,951, dated August 18, 1891.

Application filed January 15, 1891. Serial No. 377,901. (No model.)

To all whom it may concern:

Be it known that I, JOEL ETTINGER, of Milton, in the county of Northumberland and State of Pennsylvania, have invented certain Improvements in Machines for Making Washers, of which the following is a specification.

My invention relates to a machine for automatically punching washers and discharging them from the back of the cutting-die. In its general organization it resembles and may be considered an improvement on or modification of the machine described in my application for patent filed December 15, 1890, Serial No. 374,774. In my former machine the stationary cutting-die provided with a rear opening for the delivery of the washers was combined with a reciprocating center punch and a stripper-plate, to remove the washers from the receiving-punch. In the present machine I employ a stationary center punch and mount the cutting-die in a reciprocating support.

In the accompanying drawings, Figure 1 is a sectional elevation of my machine. Fig. 2 is a horizontal section on the line 2 2 of Fig. 1. Figs. 3 and 4 are horizontal sections also on the line 2 2, showing the various positions of the parts.

Referring to the drawings, A represents a rigid frame of any suitable construction, B a slide mounted in the frame to move horizontally, and C a horizontal driving-shaft provided with an eccentric D, encircled by a yoke E, connected by pivot F to the slide, so that at each revolution of the shaft the slide is advanced and retracted. Any equivalent mechanism may be used for moving the slide.

G represents a horizontal tubular punch seated in and projecting beyond the front end of the slide, its central opening communicating at the rear end with a lateral opening *g*, through which the "center punchings" or "clippings," as they are technically termed, are delivered.

H represents the cutting-die, into which the end of the tubular punch advances. The die is mounted in a horizontal reciprocating block or slide I, and is provided at the rear with a passage or opening *i* extending downward and outward to permit the escape of the washers. The die-carrying block I is urged forward at suitable times by eccentrics J, carried by a cross-shaft K and acting against the rear side of the block. Springs L serve to draw the block and die backward when relieved from the pressure of the eccentrics. These springs encircle rods *l*, attached to the die-carrying slide and bear at one end against heads or enlargements on the rear end of said rods and at their opposite ends against stationary studs or ears *l'*.

O represents the center punch, mounted at its rear end rigidly in the main frame, as shown, or in any other suitable support and projecting forward through the die-support, its axis coinciding with the axis of the die and of the tubular punch G, so that it may enter the latter as it advances. In the normal condition of the parts the die and its supporting slide stand in their rear main position, as shown in Figs. 1 and 2, so that they bear against and receive a solid support from the main frame. At this time the forward end of the center punch stands centrally within and flush or substantially flush with the front face of the die. The main punch G is retracted clear of the die, allowing a blank to be inserted between its end and the die, as indicated by dotted lines. The punch G then advances into the die and over the end of the center punch, thereby punching from the blank a washer and driving said washer backward into the expanded portion of the die. The main punch is then retracted and the die-supporting slide and die moved forward in the direction of the retreating punch around and toward the exposed end of the center punch. The effect of this movement is to cause the die-supporting slide to strip the washer off from the end of the center punch, as shown in Fig. 4, so that the washer thus released may be discharged by gravity or otherwise through the opening *i*. The die-carrying slide now retreats to its former position, so as to receive a solid support, after which the operation is repeated.

The particular advantages of the arrangement herein described are, first, its simplicity, and, second, the fact that both the die and the center punch are rigidly and immovably supported during the punching action.

Mechanism of any suitable character may be employed for advancing the die-supporting slide or block; but I prefer to employ, as shown in the drawings, a sprocket-wheel *t*,

mounted on the main shaft and connected by chain t' with pulley t^2, which in turn communicates motion through chain t^3, pulley t^4, and chain t^5 to a pulley t^6, fixed on the shaft K.

Provided the general arrangement and operation above described are retained the details of the machine may be modified in form and arrangement at will.

Having thus described my invention, what I claim is—

1. In a washer-punching machine, the reciprocating tubular punch, in combination with the stationary center punch and the reciprocating die having a rear discharge-opening.

2. In a washer-punching machine, the combination, with a frame, of the fixed center punch, the die having a rear delivery-opening, the movable die-support arranged to retreat against a rigid support, mechanism to advance the die-support to strip the washer from the center punch, the tubular punch, and mechanism to reciprocate the same.

3. The main frame, tubular punch, its carrying slide, and means to reciprocate the slide, in combination with the die having the rear delivery-opening, the die-support, the cam mechanism to advance the said support, the springs to retract the same, and the fixed center punch.

In testimony whereof I hereunto set my hand, this 9th day of January 1891, in the presence of two attesting witnesses.

JOEL ETTINGER.

Witnesses:
W. R. KENNEDY,
FABIUS STANLY ELMORE.