(No Model.) 2 Sheets—Sheet 1.

G. S. SHIMER.

MACHINE FOR MAKING METAL WASHERS.

No. 456,440. Patented July 21, 1891.

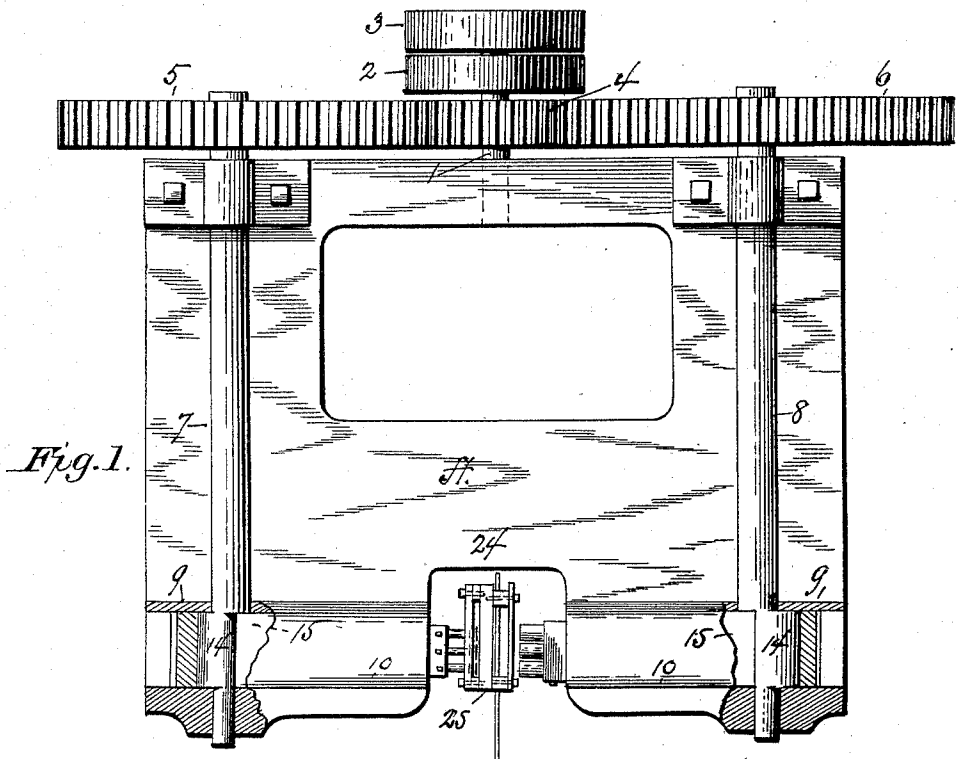


Fig. 1.

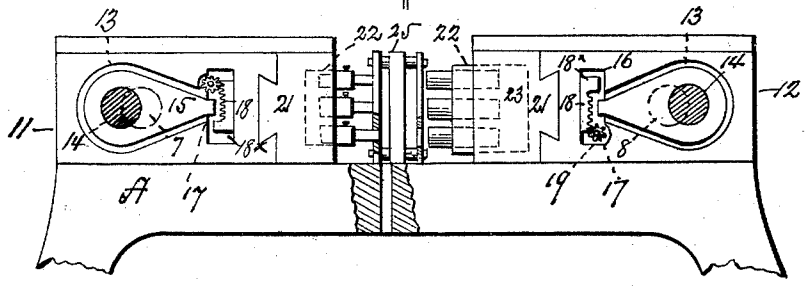


Fig. 2.

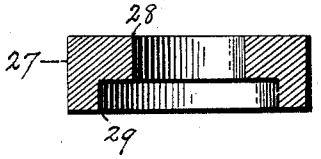


Fig. 6.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

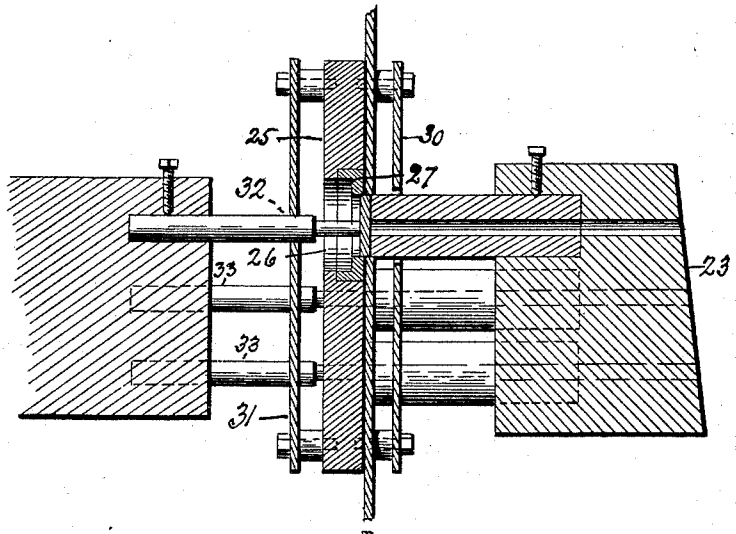


Fig. 4.

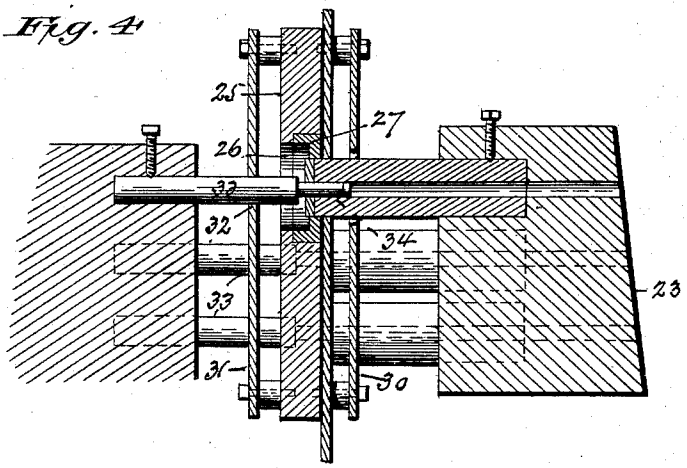
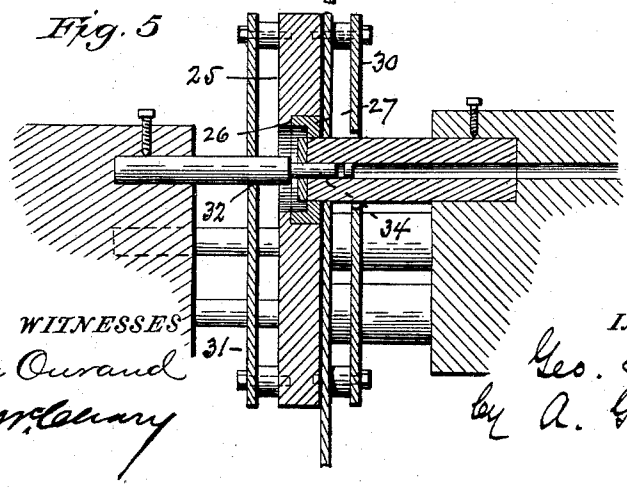


Fig. 5.



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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. 456,440, dated July 21, 1891.

Application filed December 1, 1890. Serial No. 373,224. (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 a new and useful Machine for Making Metal Washers, of which the following is a specification.

My invention has relation to an improved means for making metal washers, the object being to provide a machine employing oppositely-arranged reciprocating plungers carrying the cutter punch or punches and the center punch or punches, and an interposed die, all combined and operating to effect the cutting of a washer from a plate without the strain, noise, and wear upon the parts incident to the employment of oppositely-arranged punches which strike the plate from which the washer is cut at the same time.

Figure 1 is a plan view of the machine. Fig. 2 is a side view of the reciprocating plungers carrying the punches. Fig. 3 is a transverse section showing the position of the punches when the washer-punch has broken the plate and started the washer. Fig. 4 is a similar view showing the punches as having accomplished the cut or punch, and the center punch started on return movement with the washer-punch still in progression to deliver the washer free from the die. Fig. 5 is another like view, showing the washer carried out of the die and the center punch as receding with the washer. Fig. 6 is a detail of the die.

A designates a strong bed-piece constituting the frame on which the mechanism is mounted. Suitable supports are provided for sustaining the bed in position, substantially as shown. At the side of the bed-piece in proper bearing is journaled the driving-shaft 1, carrying a fast pulley 2 and a loose pulley 3, on which is arranged a belt (not shown) to connect with the source of power for driving the machine. On the driving-shaft is fixed a gear-wheel 4, which meshes with larger gear-wheels 5 6 on shafts 7 8, journaled in bearings on the frame, as shown in the drawings. On the bed-plate are flanges 9 10, between which are disposed the plungers 11 12, moving in a direct line with each other, as best shown in their relative position in Fig. 2 of the drawings. In the respective plungers are formed recesses 13 and a shaft-hole to take the respective shafts, and each shaft in the parts passing through the plungers is provided with an eccentric 14, having loosely mounted thereon and arranged in the recesses of the plungers a wedge-shaped block 15, by means of which the die-head or plunger is reciprocated. In the lower part of each recess is a transversely-arranged recess 16 opening into the recess containing the wedge-shaped block, as at 17, and in this transversely-arranged recess is disposed a shifting-rack 18, formed at one end with a projecting lug $18^{\times}$. In the end of the recess 16 is journaled a small gear-wheel 19, and on the extended end of the journal may be fixed a handle, so that by turning the handle the gear moves the rack until the projection 18 comes directly under the end of the wedge-shaped block when the eccentrics of the shafts are in position to move the plungers. By moving the shifting block or rack to a position which carries the projection 18 free from the end of the wedge-shaped block in the recess of the plunger the end of the block can enter the transverse recess and the shaft will turn and the block move without moving the plungers. The plungers as thus constructed form no part of my invention, as recessed plungers or die-heads with recesses and blocks of the construction shown with means for throwing the plungers in and out of reciprocation have been heretofore patented.

The plungers are for convenience made in two parts, the part having the shaft and eccentric being intended as a permanent fixture or part of the machine, and is formed at its under end with broad dovetail grooves which take the counterpart of the part 21 carrying the punches, as shown in Fig. 2 of the drawings. This construction enables punch-stocks to be exchanged, so that the same machine may carry punches of different sizes, as desired. In the parts 21 are formed the punch-seats 22, which take the punches and hold them in position. The part carrying the washer-cutting punches have openings 23 at the rear of the punches through which the center cuttings drop as they are pushed

through the punches. The punches are secured in their seats by set-screws, substantially as shown.

In the middle of the machine is a recess or opening 24, through which the cut and released washers drop into a receptacle to be taken away. Across this recess is mounted the die-bed 25, properly secured and of such strength as to stand the pressure to which it may be subjected. In the die-bed is formed the requisite number of die-seats 26, in which the die or dies are arranged. The dies 27 consist of a steel ring having a die-hole 28 of the size of the washer to be cut and formed with an annular shoulder 29, which rests on the shoulder or seat on the die-bed, as shown in Figs. 3, 4, and 5 of the drawings. Adjacent to the die-bed is secured a stripping-plate 30, which prevents the plate from buckling when the punch is withdrawn to make another stroke. Space enough is left between this stripping-plate and the face of the die-bed to permit the plate from which the washers are cut to be fed with convenience and certainty. On the opposite side of the die-bed is secured the washer-stripper 31, having a hole 32 large enough to take the body of the center punch and strip the washers from its punch end. The center punches 33 are arranged and secured in the plungers, as are the washer-punches, and have punch ends 34 formed to fit the bore of the washer-punches, as illustrated in the drawings.

I have shown in Figs. 3, 4, and 5 the several positions of the tools during the making of the washers, and in explanation thereof state: The gearing of the machine is arranged to carry the washer-punch in its engagement with the plate slightly in advance of the approach of the center punch, the relative position of contact at the start being shown in Fig. 3, wherein the washer-punch has broken the washer from the plate and has forced it partially in the die and the center punch has advanced with its end against the advancing washer. The punches at this point continue to advance toward each other until the center punch pierces the washer and moves far enough to enter the bore of the washer-punch, substantially as seen in Fig. 4, and the washer-punch has pushed the washer free from the die, when the center punch recedes, as shown in Fig. 5 of the drawings, when the washer is carried by the punch against the stripper and is pulled off and falls away.

The operation of cutting the washer is indicated in the foregoing description; but to consecutively specify the mode of making the washer the following is specified: The plate from which the washers are cut is pushed between the die-bed and the stripper-plate next to the washer-punch, when, as specified, the washer-punch proceeds to engagement with the plate in advance of the center punch and breaks the washer from the plate, forcing it into the die. This being accomplished, the advance of the washer-punch continues until the center punch advances and engages the washer from the opposite sides, both punches advancing until the washer is entirely cut and freed from the die and left on the center punch, when the punches recede and the washer is carried back, lodged on the center punch until the stripper is encountered, when, the retrocession of the center punch continuing, the washer is pulled off the punch and dropped through the opening in the frame and into the receptacle.

It is proper to state that should the center punch not get back far enough to drop the washer under the adjustment of the gearing, as specified, for the center punch must be brought back far enough to insure the discharge of the washer by the stripper-plate, the adjustment must be made by shifting a cog on the gear, so as to carry the center punch back while the washer-punch is still advancing.

Having thus given a written description of the invention and of the manner and process of making and effecting the same, and explained the principle thereof and the mode in which I contemplate applying that principle, so as to distinguish it from other inventions in the art, I now proceed to particularly point out and distinctly claim the parts, improvements, and combinations.

I claim as my invention as follows:

1. In a washer-making machine, the combination of a reciprocating center punch, a reciprocating washer-punch having a movement to engage the plate from which the washers are cut in advance of the center punch, and an interposed die between the punches, within which both punches are adapted to project, substantially as described.

2. In a washer-making machine, the combination, with a washer-punch and a center punch, of a die interposed between the punches, mechanism for moving the washer-punch in advance of the center punch, and mechanism for advancing the center punch to intersect the washer-punch within the die after the washer-punch has partially severed the washer from the plate, substantially as described.

3. In a washer-making machine, the combination of a washer-punch and a center punch and mechanism for advancing said punches toward each other, a die arranged between the punches, and a stripper through which the washer-punch passes, for preventing buckling of the plate from which the washer is cut, substantially as described.

4. In a washer-making machine, the combination, with a washer-punch and a die adjacent thereto, of a center punch, mechanism for moving the washer-punch to partially sever the washer, and mechanism to move the center punch in contact with the partially-severed washer, and strippers on opposite sides of the die to respectively strip the washer-plate and the cut washer, substantially as described.

5. In a washer-making machine, the combination of a reciprocating washer-punch formed with a central bore to take the center punch, a reciprocating center punch to engage the bore of the washer-punch, an interposed die between the ends of the punches, the washer-punch being geared to strike the plate in advance of the center punch, a stripper-plate to free the plate from the washer-punch, and a stripper-plate to free the washer from the center punch, substantially as described.

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

GEORGE S. SHIMER.

Attest:
W. H. BECK,
C. A. ROAT.