R. HUMPHREY.

Dies for Punching Washers.

No. 141,055. Patented July 22, 1873.

Fig. 1.

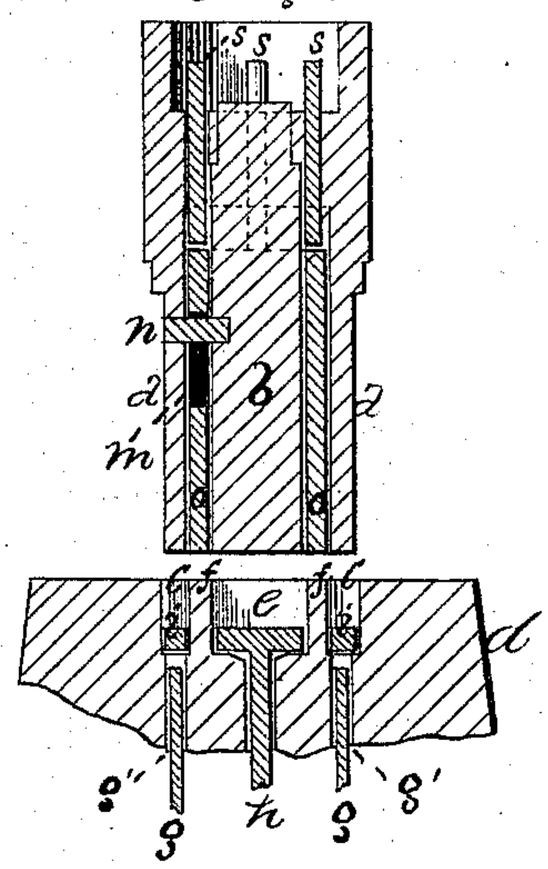


Fig 2

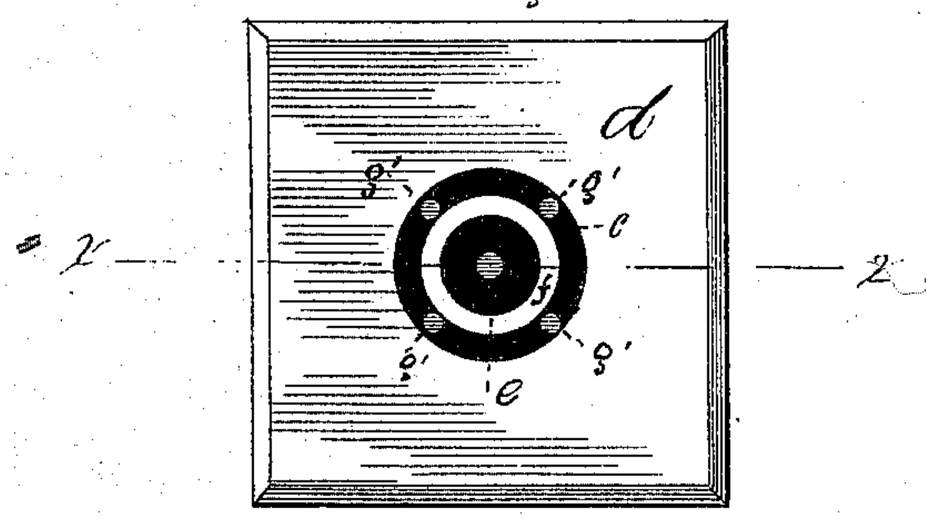
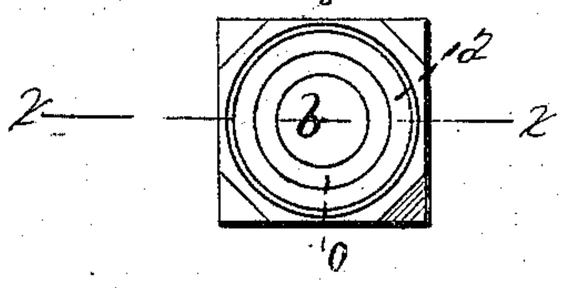


Fig. 3



WITNESSES.
Geo. C. Sill
John Pollitt

INVENTOR.
Russell Humphrey
By W. E. Simmons
his atty

UNITED STATES PATENT OFFICE.

RUSSELL HUMPHREY, OF UNIONVILLE, CONNECTICUT.

IMPROVEMENT IN DIES FOR PUNCHING WASHERS.

Specification forming part of Letters Patent No. **141,055**, dated July 22, 1873; application filed December 2, 1872.

To all whom it may concern:

Be it known that I, RUSSELL HUMPHREY, of Unionville, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Dies for Punching two or more Washers at once, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a view, in central section, of the upper die or punch and the lower die, through the plane indicated by the dotted lines *x x* in Figs. 2 and 3. Fig. 2 is a top or plan view of the lower die. Fig. 3 is an end view of the lower or cutting end of the upper die or punch.

The apparatus is a device for cutting or punching out two or more washers or rings from a sheet of metal at once, the washers being cut in concentric rings.

I will describe the invention as applied to the cutting of two washers at once.

The upper die or punch is composed of two punches, one within the other. The outer one, *a*, is an annular or ring punch, which cuts out the larger washer. The inner punch *b* is solid and circular, and is fastened at its upper end into the body of the outer punch. This punch *b* cuts out the central opening in the smaller washer. The outer punch, when it moves down, enters a corresponding annular groove, *c*, made for it in the lower die *d*, and the punch *b*, when it moves down, enters the central opening *e* made for it in the die *d*. The annular projection *f*, between the groove *c* and the opening *e*, forms a punch which, as the upper die moves down, cuts out the smaller washer, this stationary punch *f* entering the upper die between the two punches. The larger washer is left, when cut by the punch *a*, in the groove *c*, and the central punching, cut by the punch *b*, is left in the opening *e*. The outer washer is brought to the surface of the die *d*, when the punch moves up, by the ring *i*, which fits loosely in the groove *c*, and is pushed up to the surface of the die *d* by the pins *g* running down through holes *g'*, out at the bottom of the die *d*, and impelled upward to the proper point by springs or a positive movement. The central punching left in the opening *e* is brought to the surface of the die *d* by the headed pin *h*, operated in the same way. Between the two punches *a* and *b* is a thimble or sleeve, *o*, having, with reference to the two punches, a short up-and-down play. This thimble is slotted on one side at *m*, and a pin, *n*, is driven, from the outer to the inner punch, through this slot. Practically, this thimble is held stationary while the two punches move up and down, or nearly stationary. There are pins *s* running down, in proper holes, through the top of the upper die, and these pins, by proper connection with the operating-cams, are held stationary while the upper die moves up and down. They bear upon the top of the thimble.

When the upper die starts down the thimble, at first, starts down with it, but, the thimble meeting the plate out of which the washers are to be punched, its downward progress is stopped, while the two punches move on, and do their work; and the effect of this is to leave the smaller washer upon the face of the thimble, and embedded between the two punches *a* and *b*. When the upper die moves up again the upper end of the thimble meets the pins *s*. Its upward progress is stopped, so that the lower end of the thimble again becomes flush with the faces of the two punches, thus expelling the washer. The two washers and the central punching now lie on the face of the die *d*, and are brushed off, preparatory to another punching.

It is obvious, from the description, that, by an alteration of punches and thimbles, this invention can be applied to the simultaneous production of more than two washers.

So far as these Letters Patent are concerned, I do not claim anything hereinbefore described as my invention except what is expressly specified in the following claims.

I claim as my invention—

1. The combination and arrangement of the punches *a* and *b*, the expelling-thimble *o*, and the pins *s*, constructed and designed to operate substantially as described.

2. In combination with the punches *a* and *b*, the die *d*, having corresponding openings for such punches to enter, and a projection, *f*, corresponding to the opening between the punches, constructed and designed to operate substantially as described.

3. The combination of the die *d*, having the groove *c* and opening *e*, with the expelling devices described, constructed and designed to operate substantially as described.

RUSSELL HUMPHREY.

Witnesses:

W. E. SIMONDS,

J. POLLITT.