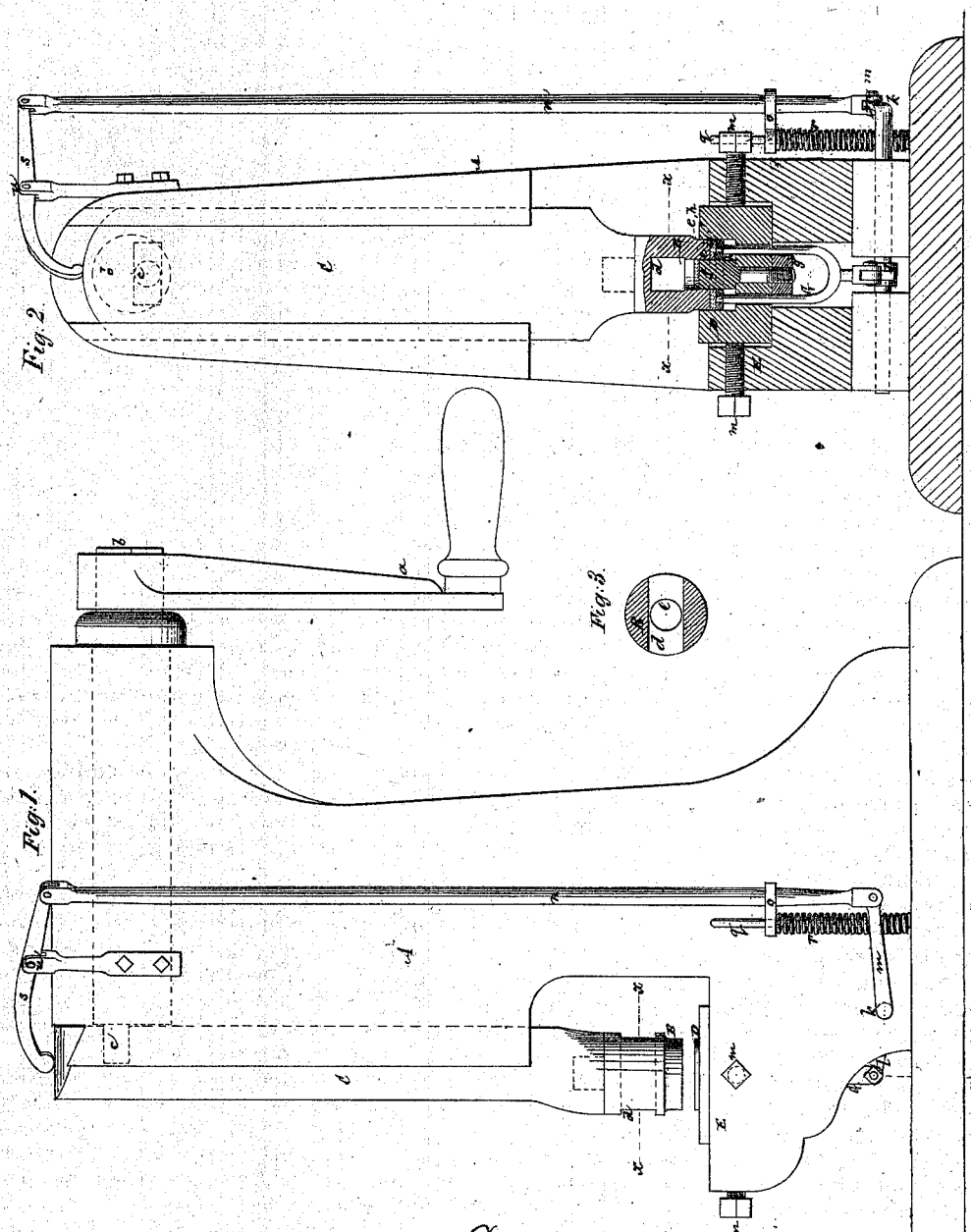
E. R. BROWN & JAMES LONG.

Improvement in Punching-Machines.

No. 115,156. Patented May 23, 1871.



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UNITED STATES PATENT OFFICE.

EZRA R. BROWN, OF MAUCH CHUNK, AND JAMES LONG, OF PACKERTON, PENNSYLVANIA.

IMPROVEMENT IN PUNCHING-MACHINES.

Specification forming part of Letters Patent No. 115,156, dated May 23, 1871.

To all whom it may concern:

Be it known that we, EZRA R. BROWN, of Mauch Chunk, in the county of Carbon and State of Pennsylvania, and JAMES LONG, of Packerton, in the county and State aforesaid, have invented a new and useful Improvement in Punches, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing forming part of this specification, and in which—

Figure 1 represents a side elevation of a press for punching washers constructed in accordance with our invention; Fig. 2, a partly-sectional front view of the same; and Fig. 3, a transverse section through the punch proper, taken as denoted through the line *x x* in Figs. 1 and 2.

Similar letters of reference indicate corresponding parts throughout the several figures.

Our invention is designed for the punching of washers of metal or other suitable material; and consists in an advantageous combination of devices for operating the discharger.

Referring to the accompanying drawing, which shows the press as operated by hand through a crank or handle, *a*, but which may be driven by any other power applied to rotate a shaft, *b*, that has its bearing in the upper portion of the main frame A, up-and-down motion is communicated to the punch proper B by a sliding bolster, C, in the lower end of which the punch is secured, and which is driven by an eccentric pin, *c*, on the front end of the shaft, and arranged to work in a slot in the bolster. The punch B is of an annular construction at its lower or operating end, corresponding with the size of the washer to be punched, and is furthermore provided with a lateral or transverse opening, *d*, in it, preferably of greater cross dimensions than the lower central opening *e* in the punch, with which it communicates. The object of the transverse opening *d* in the punch is to provide a clearance for the burs as punched out of the washers, and forced by the action of the punch in communication with a central core, *f*, in a lower die, D, up into the punch, said burs passing or being forced out of the opening *d* as they accumulate therein. The die *d* is adjustable by means of set-screws, *m*, within a recess in the bed E of the press, and, like the punch, removable, to provide for the production of different-sized washers by the substitution of other dies and punches. Said die, within which the punch works to force out the washer from the plate or sheet as the latter is laid on top of the die, is of reverse contour with the operating end of the punch, to allow of the latter working closely but freely within it when entering and leaving the same, the central core *f*, which projects upward from the die, entering the punch as the latter enters the die. This central core *f* it is preferred to attach in a removable manner to the die by forming it with a shank, which passes through the base of the latter, and securing it below by a nut, *g*. This separate attachment of the core provides for its removal when heated, or when a different-sized hole in the washer is required, and substitution of another core in the same die, according to circumstances.

By means of the annular punch and die, as described, a washer is struck out of the plate or sheet at a single blow, and the burs are discharged through the transverse opening in the punch.

To provide for the discharge of the washer as made there is arranged below the die, and so as to project up through or into its annular recess, straddling the central core *f*, a forked discharger, G, that may be mounted by a ring, *h*, at its upper end, arranged to freely fit the annular recess in the die, and serving as a base by which to discharge the punched washer *i* above the upper face of the die, from whence it may be brushed off by hand or otherwise. This forked discharger G descends in concert with the punch and rises as the latter ascends, in order to effect its proper action as a clearer. It may be guided and steadied in its action, and the ring *h* be relieved from binding in the die, and the level of the ring be preserved so as to prevent the washer from binding when being forced out of the die, by making the prongs of the forked discharger fit closely but freely the holes in the base of the die. The construction of said discharger is exceedingly simple, yet strong, being formed by merely bending a rod or wire and connecting its free upper ends by the ring *h*.

Various mechanisms may be employed for

giving to the discharger its necessary movements; but the following means have been found very efficient for the purpose: Arranged below said discharger is a rock-shaft, *k*, which is connected with the lower end of the discharger by a lever, *l*. Another arm or lever, *m*, connects said rock-shaft at its outer end with a vertical rod, *n*, that carries an arm, *o*, which works on or over a guide-rod, *q*, and bears down on, or is borne up by, a spring, *r*, wound around the rod *q*. Connected with the upper end of the rod *n* is a lever, *s*, having its fulcrum as at *u*, and arranged to bear or rest upon the upper end of the sliding bolster C, that in rising acts upon the lever *s* as against the pressure of the spring *r*, which latter, in the return stroke of the bolster, operates to lower the discharger and keep the discharging mechanism in proper connection for timely action with the bolster and its punch.

What is here claimed, and desired to be secured by Letters Patent, is—

The combination, with the discharger G and sliding bolster C, of the rock-shaft *k* with its lever *l m*, the rod *n* with its lever *s*, the arm *o*, guide-rod *q*, and spring *r*, substantially as specified.

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