T. G. Arnold,

Metal Punch,

No. 83,586. Patented Nov. 3, 1868.

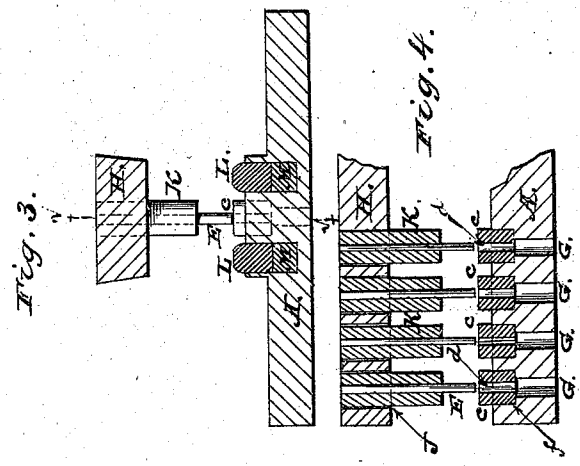

Fig. 3.

Fig. 4.

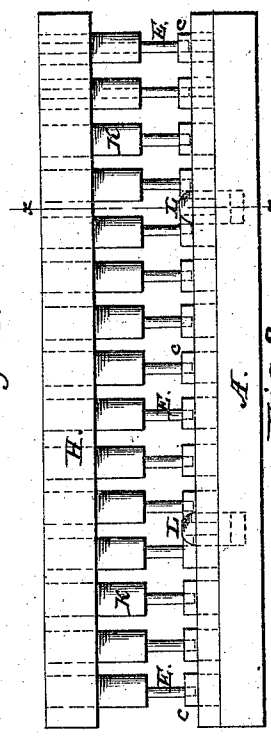

Fig. 1.

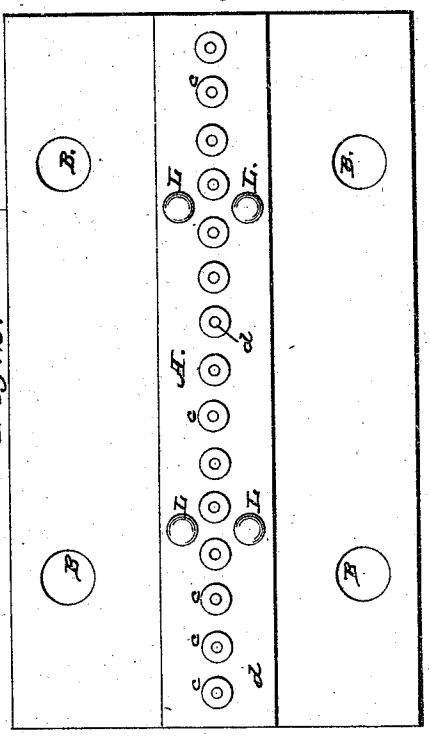

Fig. 2.

Witnesses:
Charles L. Parritt
Franklin Parritt.

Inventor.
T. G. Arnold.

United States Patent Office.

T. G. ARNOLD, OF NEW YORK, N. Y.

Letters Patent No. 83,586, *dated November* 3, 1868; *antedated October* 24, 1868.

IMPROVEMENT IN DIES AND PUNCHES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, T. G. ARNOLD, of the city, county, and State of New York, have invented certain new and useful Improvements in Dies and Punches for perforating sheet-metal plates; and I do hereby declare that the following is a full description of the same.

The nature of my invention consists—

First, in combining, with a permanent bed-plate, a detachable die-holder plate, having a series of adjustable dies therein, whereby the die-holder plate and dies may be renewed without the cost and labor of renewing the bed-plate, as would be the case, if they were not used, when it became much worn.

Second, in combining, with the adjustable dies and bed-plate, a series of elastic plate-clearers, for the purpose of lifting the sheet-metal plate from off the ends of the dies after being punched.

Third, in combination with the punches and punch-holder, adjustable punch-stiffeners, through the axis of which the punches are inserted, so as to expose but a small portion of their length to penetrate the sheet-metal plate, and thus be kept always rigid and firm while doing their work.

But to describe my invention more particularly, I will refer to the accompanying drawings, forming a part of this specification, the same letters of reference, wherever they occur, referring to like parts.

Figure 1 is a side view of the dies and punches.

Figure 2 is a plan view of the dies, and face of the die-holder plate in which they are inserted.

Figure 3 is a transverse cut section of the dies and punches, through the line x^1 x^1, fig. 1, showing the elastic plate-clearers.

Figure 4 is a longitudinal cut section of the dies and punches, through the line x^2 x^2, fig. 3.

Letter A is the detachable die-holder plate, having four bolt-holes, B, vertically through it, for admitting of its being bolted to the bed-plate frame of a press. The form and size of the die-holder plate may be varied to suit circumstances, and the number of punches used, and when thus made, and perforated for the insertion of the dies C, and bolted to the bed-plate, becomes a permanent fixture in the press.

The dies C are formed of cylindrical blocks of tempered or hardened steel, having a perforation through their axis, *d*, for the punches E to enter. They may be made of any desired length, to admit of their being securely and firmly held in the cavities *f*, formed in the face of the bed-plate.

For the purpose of carrying off the pieces of metal cut out by the punch, a perforation, G, is made from the lower side of the bed-plate, of slightly increased diameter to that of the aperture in the die, so that the scrap of metal may free the die instantly it passes through it.

Letter H is the punch-holder bar, which is made with bevelled edges, so as to admit of being slid into a groove, cut in the lower face of a cross-head, for operating the punches. Vertically through the punch-holder bar is cut a series of holes, into which are secured metal collars, K, of any required length, and corresponding with the dies in the face of the die-holder plate. Through the centre of these collars are inserted, from the upper side, steel punches, E, which, being driven or forced in by pressure, prevent their falling out, while they are prevented from being forced back out of the collars, when punching the metal, by the cross-head pressing on their upper ends.

Letters L are elastic plate-clearers, formed by inserting plugs in recesses cut in the face of the bed-plate of press, alongside of the dies, and supporting them on rubber springs, M, so that when the sheet of metal has been depressed by the action of the punches, the studs will follow them back, and thus lift or clear the dies, to facilitate the operations of the punches.

It will be obvious that other applications of elastic die-clearers may be used, and therefore I do not intend to confine myself to the precise devices herein described, so long as I retain the principle of operation to accomplish the object aimed at.

It will be obvious, also, that though I have exhibited only cylindrical punches in combination with my improvements, the same improvements may be combined with punches and dies of any required shape, form, and size, and therefore desire it to be understood that my invention is designed to be of universal application, so far as the same may be applied to dies and punches for perforating or cutting sheets of plate-metal.

Having now described my invention, I will proceed to set forth what I claim, and desire to secure by Letters Patent of the United States.

1. I claim the combination of the die-plate A, series of removable dies C, and spring die-clearer L, arranged substantially as described.

2. I also claim the combination of the plate H, series of punch-supporting tubes K, and punches E, arranged substantially as described.

T. G. ARNOLD.

Witnesses:

CHARLES L. BARRITT,
FRANKLIN BARRITT.