P. E. Austin,

Metal Punch,

No. 84,468. Patented Dec. 1, 1868.

Fig. 1.

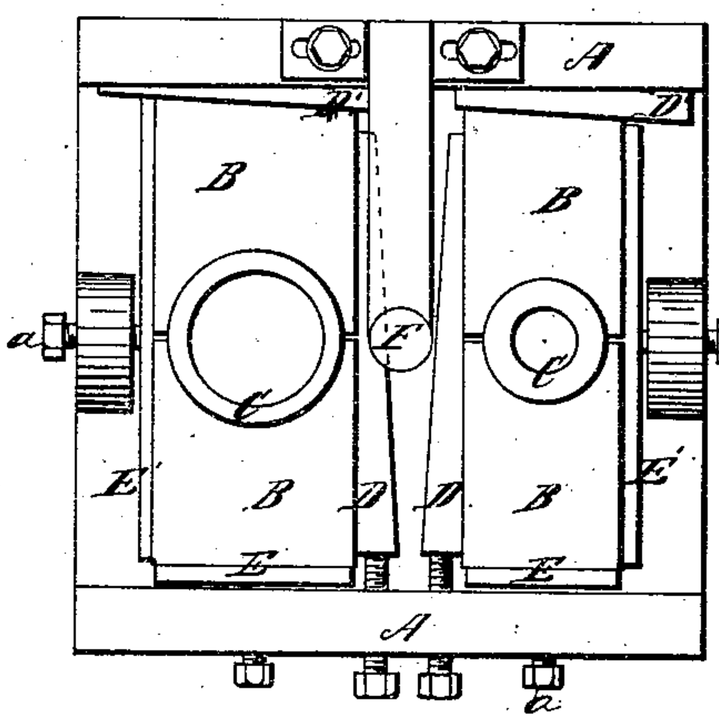


Fig. 2.

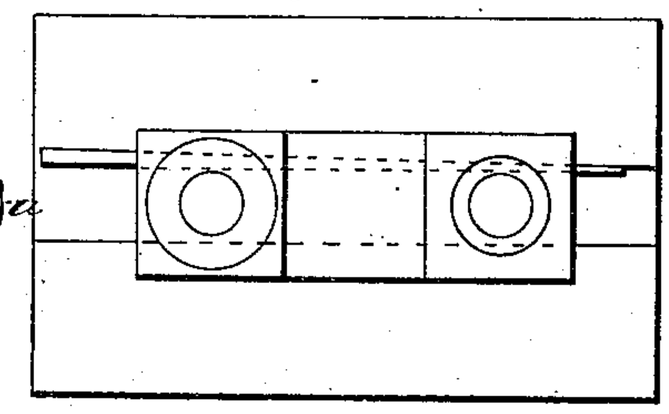


Fig. 4

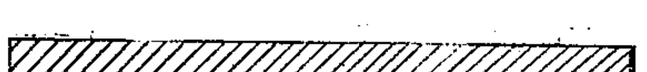


Fig. 3.

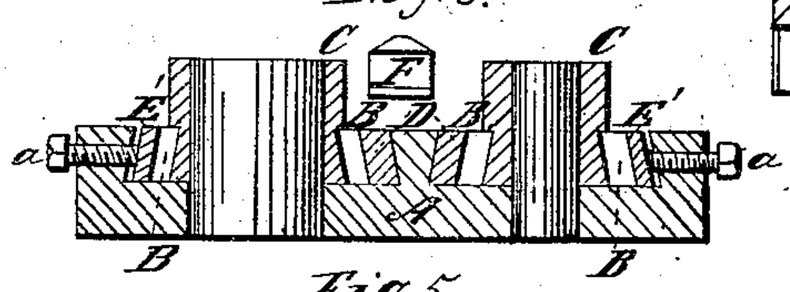


Fig. 5.

Fig. 6.

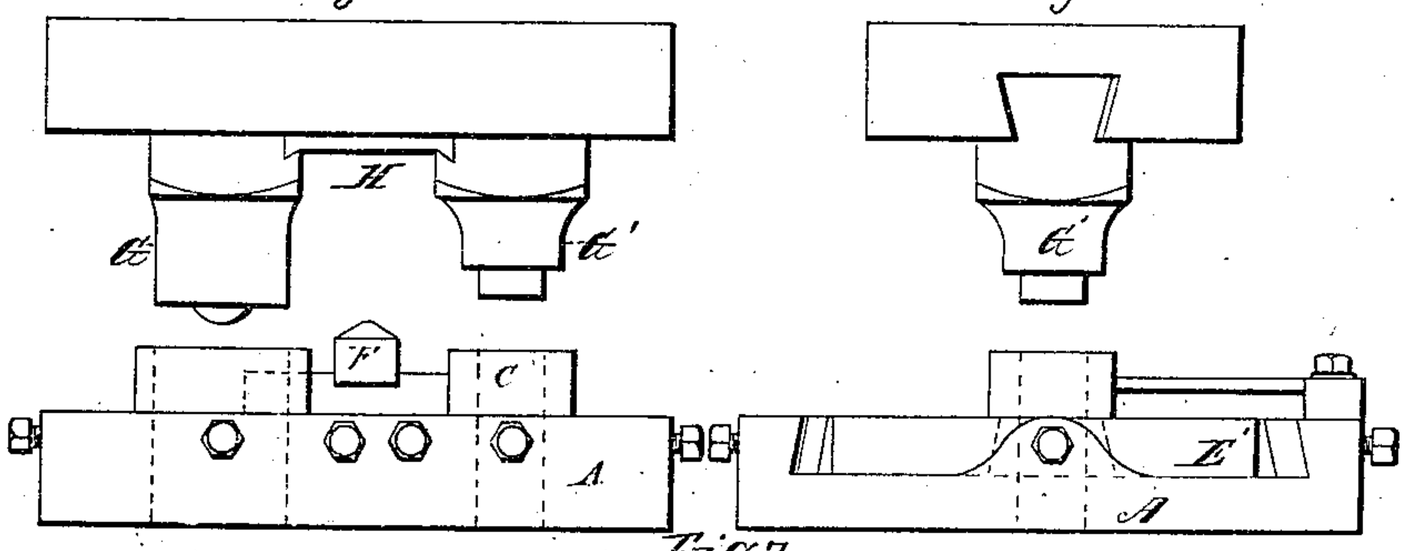
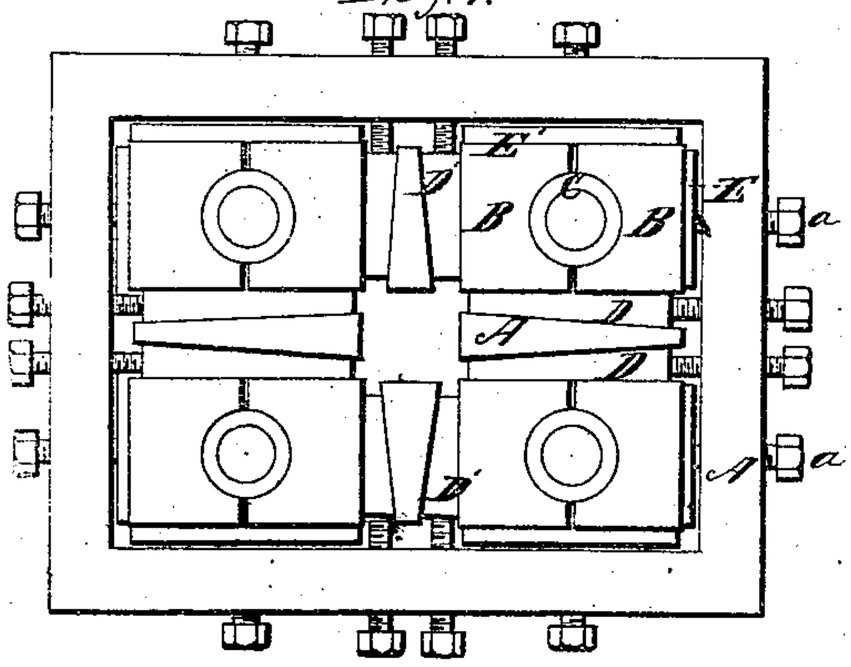


Fig. 7.



Witnesses

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PHINEAS E. AUSTIN, OF NEW HAVEN, CONNECTICUT.

Letters Patent No. 84,468, *dated December* 1, 1868.

IMPROVED METHOD OF HOLDING AND ADJUSTING 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, PHINEAS E. AUSTIN, of New Haven, county of New Haven, and State of Connecticut, have invented a new and useful Improvement in the Method of Holding and Adjusting Dies and Punches; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon. Said drawings constitute part of this specification, and represent, in—

Figure 1, a plan of the lower or female set of dies, showing the manner of holding the same;

Figure 2, a plan of the upper or male set of dies;

Figure 3, a cross-section of the lower dies, taken through line *x x;*

Figure 4, a section of the upper dies, taken through line *y y;*

Figure 5, a side view, with the upper and lower set of dies in their proper relative positions;

Figure 6, an end view of the same; and, in

Figure 7, a plan for using and adjusting four dies in the same machine.

Similar letters of reference, when they occur in the separate views, indicate like parts.

My invention relates to an improvement in the method of holding and adjusting dies and punches; and consists of two or more dies or punches, which are acted upon separately by a series of clamps and wedges, whereby the dies may be moved either backward or forward or at right angles, thus enabling the said die to be adjusted to a nicety, without the labor which is necessarily incurred in the method now in use.

In cutting any article under a press, which has to undergo two or more operations before leaving the same, as, for instance, in making washers, it is very much more convenient to use a set of dies or punches, that is, one die or punch for each operation, set at the requisite distance apart, and worked by the same power at the same time, thereby performing all the operations by simply passing the iron from which they are to be cut once through the press. This has been done in the case of washers, which have been cut by having a double die made either of one and the same piece of iron or steel, or held firmly together and fastened into the head of the press, these being lined and fitted in the ordinary way of fitting dies and punches. The great objection to this method is that, whenever the male or female dies or punches are sharpened, it is necessary to upset them, and, in so doing, they are thrown out of line, so that, when they are replaced in the head of the press, it is necessary to line and fit them anew, making so much extra work as to render the use of a double die in this way impracticable. To obviate this, and render the use of two or more dies, thereby punching two or more holes in one piece of metal at the same time, practical and simple, and, in so doing, saving time and labor, is the object of my invention.

To enable others skilled in the art to make and use my improvement, I will proceed to describe the construction and operation of the same.

A is a bed-plate, made in a suitable form, to hold the dies and form proper bearings for the clamps and wedges.

B is the frame of the die, made in two parts, between which the thimble or female die C is held.

The circle in the die-frame, into which the thimble sets, is bevelled downward. The tumbler C is also correspondingly bevelled, as shown in fig. 3. This prevents the said thimble from being lifted out of place by the operation of the press.

The die-frame, being made in two parts, enables the using of different-sized dies by simply removing the thimble and replacing one of the required size with the same die-frame, the said thimbles being equally as firm as if the said die-frame and thimble were solid.

D and D′ are wedges, which slide against a portion of the bed-plate, and act upon two sides, or rather one side and one end of the die-frame. These wedges may be operated either by driving them to their place or by means of set-screws, as shown in the drawing.

E and E′ are clamps or gibs, also acting upon the die-frame, and pressed forward against the same by means of set-screws *a*, which pass through the edge of the bed-plate, as shown in fig. 3.

F is a gauge-pin, placed upon a spring, and fastened to the bed-plate. This gauge-pin should be placed equidistant between the centre of the two punches. It is made of the same size or a very little smaller than the small die or punch. Its object is to hold the metal steady, and in its proper place, while being punched. It is also made adjustable, by means of screws, with slotted bearings, in order to allow for the variations in the size of the dies.

G and G′ are two male dies, which are inserted in a dovetailed groove made in a frame, and held firmly in their positions by means of a wedge.

These said dies are also held together by means of a connecting-block, H, which is dovetailed into each, in such a manner that, when they are placed in the groove of the frame, and the wedge driven, it tends to draw the two dies down upon the dovetailed ends of the connecting-block, and make it impossible to separate the dies until they are taken from the groove in the frame. The object of this connecting-block is to allow the said dies G and G′ to be set at different distances apart, by using blocks of different lengths. I have shown these dies as held, also, by a bolt passing through both dies and connecting-block; but this is merely for additional security, and is not essential, the dies being held firmly enough for all practical purposes without it.

This completes the construction of my improvement.

The operation is as follows:

In order to adjust the dies, the upper set or male dies, which are fixed, are carefully lowered into the

lower set or female dies, as shown in red, fig. 5, which are left loose and movable. While the dies are thus together, the clamps or gibs E and E′ may be brought to bear upon the die-frame, after which the wedges D and D′ may be driven or screwed inward until the die-frame and thimble are held sufficiently firm for use. After this, the metal from which the article is to be made is introduced.

In the case of washers, the first operation is to cut or punch the centre hole. After this, the metal is passed forward until the hole reaches the gauge-pin F. The spring on the said gauge-pin throws it into the hole, where it is secured until another hole is punched. It is then passed forward again until the last hole punched reaches the gauge-pin. The hole first punched has now reached the centre of the large die or thimble C, and, as the upper dies G descend, and with every succeeding revolution a descent of the said dies, until the material is exhausted, a washer is cut, and, also, another hole is punched.

It is noticed that the large male die is given the lead, or made longer than the other. This is to prevent any bending or crowding of the metal, which would be liable to occur if both dies struck at the same time.

The method shown in fig. 7 is in every way similar to the one above described, except it is for the use of four dies, instead of two, and requires a different-shaped bed-plate. The thimbles are held in a frame, and the frame acted upon by clamps or gibs and wedges, exactly in the same manner as in the case of two dies.

Having thus fully described my invention,

What I claim as new and useful, and desire to secure by Letters Patent, is—

1. The arrangement of the several dies, clamps, wedges, and screws with the frame, as described, and for the purpose specified.

2. The spring gauge-pin F, in combination with the dies, in the manner and for the purpose specified.

3. Arranging the punches in the punch-stock, and confining them to one another by means of the block H, and to the stock by means of the dovetailed tenons fitting into the dovetailed groove in the stock, and the wedge, all substantially as described.

4. The connecting-block H, placed between the two punches or male dies, for the purpose of holding them together, substantially in the manner and for the purpose specified.

PHINEAS E. AUSTIN.

Witnesses:

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RUFUS H. SANFORD.