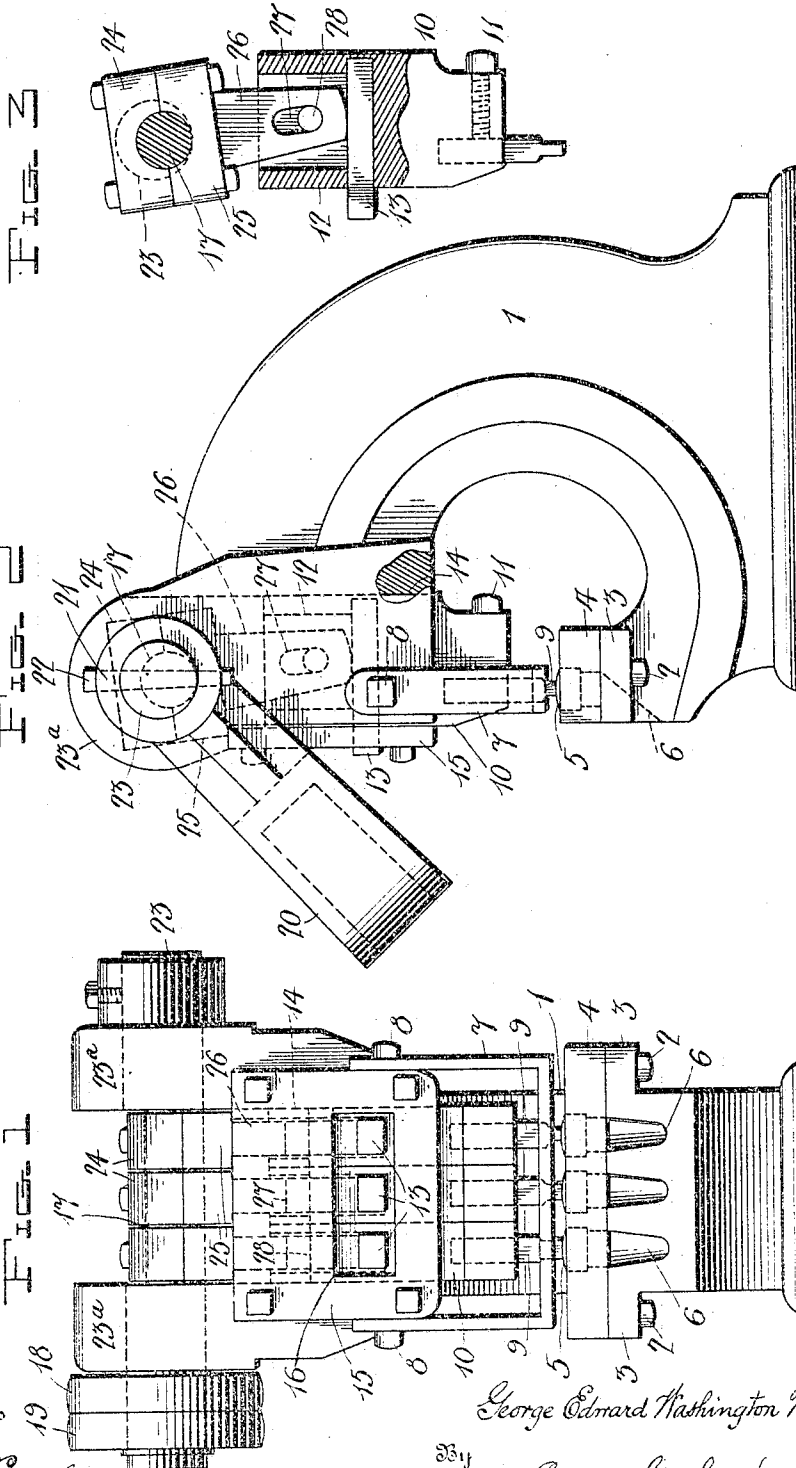


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G. E. W. MARSDEN.
MULTIPLE PUNCH.

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MULTIPLE PUNCH.

SPECIFICATION forming part of Letters Patent No. 787,849, dated April 18, 1905.

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To all whom it may concern:

Be it known that I, GEORGE EDWARD WASHINGTON MARSDEN, a citizen of the United States, residing at Janesville, in the county of Rock and State of Wisconsin, have invented certain new and useful Improvements in Multiple Punches, of which the following is a specification.

My invention relates to multiple punches. It belongs directly to that class of machines designed to perforate metal, in which dies and punches of various forms or different sizes are set and adjusted accurately and intended to remain in position more or less permanently.

My invention consists in the special form and arrangement of devices provided whereby one or more of the punches may be caused to act while the others remain inoperative. It is in every way economical and desirable in punching machinery that the dies or punches once accurately set should not be disturbed, inaccuracy in placing the tools being followed by damaging consequences, besides which where the punching elements are repeatedly removed and replaced there is much wear upon set-screws and threads. Again, the time consumed in removing a punch and die and setting others correctly is considerable, and all these objections are overcome by employing a machine in which punches of the sizes desired to be used are set once for all at the beginning of the job.

Each constituent element of my invention is described in detail, and its individual office, together with the mode of operation of the whole, is fully explained herein.

I accomplish the object stated by constructing and associating the parts as illustrated in the accompanying drawings, of which—

Figure 1 represents a front view of my invention equipped with pulleys adapted to be driven by belting from a source of power. Fig. 2 is a side view of my invention provided with a hand-lever socket and intended to be operated by hand; and Fig. 3 is a frag-

mentary side view, partly in section, showing the eccentric, yoke, and tailpiece and the manner of the engagement between the tailpiece and the recessed mandrel. A side view of the mandrel is shown in this figure and also the manner of applying the operating-key.

Like numerals refer to like parts in the several views.

Considering the drawings, numeral 1 designates the body of the machine, which may be of any chosen form or weight. Screws 2 upon either side of the lower and forward part or foot of frame 1 (see Fig. 1) pass upwardly through lateral extensions 3 3 and enter the die-bed 4, which is in that manner secured transversely upon the frame.

Numeral 5 marks the series of dies in bed 4, and beneath the dies are recesses 6, fashioned to permit the slugs punched out to fall to the ground.

Numeral 7 refers to the stripper attached to the upper forward portion or head of the frame by screws 8. (See Fig. 1.) This element may be of any desired form and arrangement and constitutes no part of my invention.

Punches 9 pass through the stripper in proper position to engage the dies. I have shown three punches of different sizes; but it will be understood that a greater number may be provided for in different machines. The mandrels or punch-holders are marked 10. In Fig. 3 the form of these parts is best shown. A suitable socket is provided for the punch in the lower end of the mandrel, and a set-screw 11 holds the punch in place. Each mandrel is cored out in its upper end, forming the recess 12, and the bottom of the recess is finished to present a true flat surface, upon which rests the operating-key 13. To hold key 13 in position upon the bottom of the recess 12, corresponding holes are formed through the front and partly through the back of the mandrel, and the key 13 in Fig. 3 is shown passing through such holes. The mandrels are placed side by side in recess 14

in the head of frame 1, (see Fig. 1,) and they are covered by the plate 15, held to the frame by the screws 16, as indicated. Thus the mandrels may be reciprocated vertically and independently of each other, being guided by the recess 14 and by each other. The width of recess 14 is indicated in Fig. 1 and equals the combined thickness of the three mandrels; while the depth of the recess is indicated in Fig. 2 and equals the width of the mandrel.

Cover-plate 15 is provided with an opening 16, through which the operating-keys may be introduced into and withdrawn from the mandrels. Sufficient width vertically is given the opening 16 to allow for the rise and fall of the ends of the keys projecting through it as the mandrels are raised and lowered.

The main shaft is marked 17, and in Fig. 1 it possesses fixed and loose pulleys 18 and 19, by means of which power may be applied. In Fig. 2 a socket-fork 20 has its terminals 21 fixed to the shaft by the keys 22, and the punch is intended to be worked by a bar inserted in the socket in the customary manner.

Upon the main shaft 17 are secured or integrally formed the eccentrics 23, one in each bearing 23^a. About each eccentric is a yoke in two pieces, the cap-pieces being marked 24 and the tailpieces 25. To each tailpiece 25 there is an extension or tail 26, which occupies the recess 12 in the upper end of the mandrel. (See Fig. 3.) Through the tail near its lower end is the slot 27, and transversely through the slot and piercing the sides of the recess 12 is the lift-pin 28, equaling in length the thickness of the mandrel.

In operation the rotating shaft 17 and its eccentrics raise and lower the tails 26; but the depth of recess 12 is such that at its lowest point the end of the tail does not quite touch bottom. When, however, the key 13 is inserted in one or in any number of mandrels, the bottom of recess 12 is practically raised, and as the tail descends the mandrel is forced down and a hole is punched. The end of the tail curves slightly to rock upon key 13 easily. As the tail rises the lower end of slot 27 engages the lift-pin 28 and raises the mandrel, thus stripping the iron. So long as the key 13 is absent no movement of the mandrel results, the slot 27 being as long as the travel of the tail and merely moving down and up about the pin without pressure upon it either way. Ample room to clear the rocking movement of the tail is afforded in recess 12.

Having thus described my invention and the mode of its operation, what I claim is—

1. In a multiple punch, the combination with eccentric yokes and means for operating them, of tails projecting from said yokes and having curved lower ends, mandrels adapted to be reciprocated vertically, means connecting said tails and mandrels whereby downward movement of the tails is permitted while the mandrels are normally at rest and by which the mandrels are raised from their lowered positions, and removable keys, the said mandrels having openings to receive said keys and hold them in the paths of the descending tails whereby said mandrels are forced downwardly, the curved ends of said tails bearing and rocking directly upon said keys.

2. In a multiple punch, the combination with eccentric yokes and means for operating them, of tails projecting from said yokes and having curved lower ends, mandrels adapted to be reciprocated vertically and having recesses in their upper ends, means connecting said tails and mandrels within said recesses whereby downward movement of the tails is permitted while the mandrels are normally at rest and by which the mandrels are raised from their lowered positions, and removable keys, the said mandrels having openings to receive said keys into said recesses and to hold the keys in the paths of the descending tails whereby said mandrels are forced downwardly, the curved ends of said tails bearing and rocking directly upon said keys.

3. In a multiple punch, the combination with the eccentrics and means for rotating them, of tails operated by said eccentrics, mandrels arranged to be reciprocated vertically, each mandrel having a recess in its upper end, the said tails entering the said recesses and movable up and down therein without contact with the bottoms of the said recesses, keys adapted to be inserted in the mandrels and resting upon the bottoms of said recesses in the path of the descending tails whereby the said mandrels are forced downwardly, the said tails being provided with longitudinal slots, and pins passing through said slots and through the sides of the mandrels whereby the mandrels are raised after punching.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE EDWARD WASHINGTON MARSDEN.

Witnesses:

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