

UNITED STATES PATENT OFFICE.

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PUNCH.

933,397.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JAY. C. SMITH, a citizen of the United States, residing at Kalamazoo, Michigan, have invented certain new and useful Improvements in Punches, of which the following is a specification.

This invention relates to improvements in punches.

The main objects of this invention are:

- 10 First, to provide an improved punch which is capable of very rapid and easy manipulation. Second, to provide in a punch an improved stripper mechanism in combination with the operating mechanism of the punch.
- 15 Third, to provide in a punch an improved die supporting means.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

- 20 I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

- 25 A structure embodying the features of my invention is clearly illustrated in the accompanying drawing, forming a part of this specification, in which:

- 30 Figure 1 is a side elevation of my improved punch. Fig. 2 is a horizontal section taken on a line corresponding to line 2-2 of Fig. 1. Fig. 3 is an enlarged detail vertical section taken on a line corresponding to line 3-3 of Fig. 1. Fig. 4 is a detail plan of the stripper. Fig. 5 is a side elevation thereof. Fig. 6 is a detail vertical section showing means for supporting the interchangeable dies.

- 40 In the drawings, similar reference characters refer to similar parts throughout the several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

- 45 Referring to the drawing, the frame of my improved punch comprises a base 1, an overhanging arm portion 2, there being an opening 3 between the overhanging portion and the base for the introduction of the work, the base forming a rest for the work. This base is preferably set so that its work-supporting face 4 is in alinement with the plane of a table, as my improved punch is especially adapted for the punching of sheet metal. The overhanging arm 2 is provided

with a bearing for the die plunger 5, a bushing 6 being preferably provided for the bearing, see Fig. 3. The plunger is pivotally connected at its upper end to the lever 7, which is mounted on the forward end of the arm 2 by means of the link 8. The operating lever 9 is arranged above the plunger lever 7, the operating lever being pivoted at 10 upon the upwardly-projecting post 11 at the rear end of the frame. The levers 7 and 9 are connected by the link 12. A coiled spring 13 is arranged under the plunger lever 7 to hold it normally elevated, thereby holding the die plunger normally in its retracted position. It will be obvious that by this arrangement of the levers, a very powerful leverage is secured, so that the punch can be effectively operated by hand.

The die plunger 5 is preferably provided with a threaded socket 14 to receive the threaded stem 15 of the die member 16. The advantage of this means of securing the die being that there are no projections which are likely to be stripped off in the operation of the punch, either by lifting the plunger too high, or by the projections engaging with the work.

The base 1 is provided with a vertical hole 17, which is rabbeted at its upper end to form a seat 18 for the female die member, as 19. These die members are seated in the support and can be readily changed as desired, and this, in connection with the means for detachably securing the male die member by threading into the die plunger is a very great advantage.

I also preferably provide a die holder 20, which is provided with a seat 21 to receive a die 22 of smaller size, the object being to lessen the amount of material in the die of smaller size, and one holder is adapted for holding several of the smaller sizes of dies, the holder 20 being in effect a filler member.

I also preferably provide a stripper, as 23, the one illustrated being shown in the form of a ring. This stripper is supported by a pair of levers 24, one arranged on each side of the arm 2, the levers being pivoted at 25, their rear ends being connected by the links 26 to the operating lever 29. By this connection, the stripper is actuated in a direction opposite to the direction of movement of the plunger so that it serves to strip the work from the plunger when the plunger

is retracted. The stripper is preferably mounted upon the levers so as to be thrown to one side or removed to permit the changing of the die. This I preferably accomplish by securing the stripper to one lever by a pivot 31, and providing an ear 27 on the other side of the stripper, which is slotted at 28 to engage the bolt 29 having a thumb-nut 30 thereon so that the thumb-nut may be tightened up to clamp the stripper in place. By this arrangement, the stripper is released by easing off the thumb-nut so that it can be swung on its pivot out of the way to permit the changing of the dies.

By arranging the parts as I have illustrated and described, I secure a punch which is capable of very rapid manipulation, one operator being able to effectively handle the work and operate the punch. The structure has the further advantage of being simple and economical in structure and is not likely to get out of repair in use. I have illustrated and described the same in detail in the form preferred by me on account of its structural simplicity and convenience of operation. I am, however, aware that it can be considerably modified in structural details without departing from my invention, but as these modifications will be readily understood by those skilled in the art to which this invention relates, I have not attempted to illustrate or describe the same herein.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent:

1. In a punch, the combination with the frame comprising a base and an overhanging arm, said base being adapted to support a die, said arm having a plunger bearing therein; a die plunger; a plunger lever to which said plunger is pivotally connected; a supporting link for said plunger lever arranged at the forward end of said frame arm; an operating lever pivotally mounted at the rear end of said frame; a connecting link therefor to said plunger lever; a spring normally supporting the plunger in its retracted position; a stripper; a pair of levers on which said stripper is mounted, arranged one at each side of said frame arm; and connecting links for said stripper levers to said operating lever.

2. In a punch, the combination with the frame comprising a base and an overhanging arm, said base being adapted to support a die, said arm having a plunger bearing therein; a die plunger; a plunger lever to which said plunger is pivotally connected; a supporting link for said plunger lever arranged at the forward end of said frame arm; an operating lever pivotally mounted at the rear end of said frame; a connecting link therefor to said plunger lever; a spring normally supporting the plunger in its retracted position; a stripper; and a connection

between said plunger and stripper for moving said stripper in the direction opposite to the movement of said plunger.

3. In a punch, the combination with the frame comprising a base and an overhanging arm, said base being adapted to support a die, said arm having a plunger bearing therein; a die plunger; a plunger lever to which said plunger is pivotally connected; a supporting link for said plunger lever arranged at the forward end of said frame arm; an operating lever pivotally mounted at the rear end of said frame; a connecting link therefor to said plunger lever; and a spring normally supporting the plunger in its retracted position.

4. A punch comprising a base and an overhanging arm, said base being adapted to support a die, said arm having a plunger bearing therein; a die plunger; a lever to which said plunger is connected; a second lever; a connecting link therefor to the free end of the other lever; a stripper; a pair of levers on which said stripper is mounted, arranged one at each side of said arm; and connecting links for said stripper levers to said operating lever.

5. A punch comprising a base and an overhanging member, said base being adapted to support a die, said overhanging member having a plunger bearing thereon; a die plunger; a lever to which said plunger is connected; a second lever; a connecting link therefor to the free end of the other lever; a stripper; a lever on which said stripper is mounted; and a connecting link for said stripper lever to said second lever.

6. A punch comprising a base and an overhanging member, said base being adapted to support a die, said overhanging member having a plunger bearing thereon; a die plunger; a lever to which said plunger is connected; a second lever; a connecting link therefor to the free end of the other lever; a stripper; and a connection between the said plunger and stripper for moving the stripper in the direction opposite to the movement of the plunger.

7. A sheet metal punch comprising a base and an overhanging arm, said base having means for supporting a die; a plunger movable through said arm, said plunger having a die receiving opening; a lever hinged to the arm at one end and connected with the plunger; a second lever hinged by one end to the arm; a link connecting said second lever with the free end of the other lever; a spring normally retaining the plunger in elevated position; a stripper cooperating with the plunger; and a connection between the plunger and the stripper for moving the stripper in the opposite direction to the movement of the plunger.

8. A punch comprising a bracket, having a base portion provided with an opening

therethrough, the opening being rabbeted at its upper end for receiving a die, and an overlying portion provided with an opening registering with the opening through the base; a plunger movable in the said opening for receiving a punch; a stripper for cooperating with the plunger; means for operating the plunger; and a connection between the plunger and the stripper for moving the stripper in the opposite direction to the movement of the plunger.

9. A punch comprising a vertically movable die plunger, provided with a threaded opening to receive a die, and means for supporting a die below the plunger; means for moving the plunger; a stripper comprising a ring through which the plunger moves; and a connection between the plunger moving means and the ring for moving the ring in a direction opposite to the movement of the plunger.

10. A punch comprising a vertically movable die plunger, and means for supporting a die below the plunger; means for moving the plunger; a stripper comprising a ring through which the plunger moves, and a connection between the plunger moving means and the ring for moving the ring in a direction opposite to the movement of the plunger.

11. A punch comprising a vertically movable plunger, provided with a threaded opening for receiving a die, and means for supporting a die below the plunger; means for moving the plunger; a stripper in connection with the plunger; and a connection between the stripper and the plunger for moving the stripper in the opposite direction to the movement of the plunger.

12. A punch comprising a die plunger provided with means for detachably securing a die thereto; means for removably supporting a die to coact with said plunger die; means for actuating the plunger; a stripper; a pair of stripper supporting members, said

stripper being connected to one of said members by a pivot and being detachably connected to the other member whereby it may be released and swung to one side on its said pivot; and connections for the said stripper supporting members to the plunger-actuating means for moving the stripper in the opposite direction to the movement of the plunger.

13. A punch comprising a die plunger; means for actuating the plunger; a stripper; a pair of stripper supporting members, said stripper being connected to one of said members by a pivot and being detachably connected to the other member whereby it may be released and swung to one side on its pivot; and connections for the said stripper supporting members to the plunger-actuating means for moving the stripper in the opposite direction to the movement of the plunger.

14. A punch comprising a die plunger; means for actuating the plunger; a stripper; a pair of stripper supporting levers, said stripper being connected to one of said levers by a pivot and being detachably connected to the other lever whereby it may be released and swung to one side; and connections for the said stripper levers to the plunger-actuating means for moving the stripper in the opposite direction to the movement of the plunger.

15. A punch comprising a die plunger; means for actuating the plunger; a stripper; a pair of stripper supporting levers; and connections for the said stripper levers to the plunger-actuating means for moving the stripper in the opposite direction to the movement of the plunger.

In witness whereof, I have hereunto set my hand and seal in the presence of two witnesses.

JAY. C. SMITH. [L. S.]

Witnesses:

CLARA E. BRADEN,

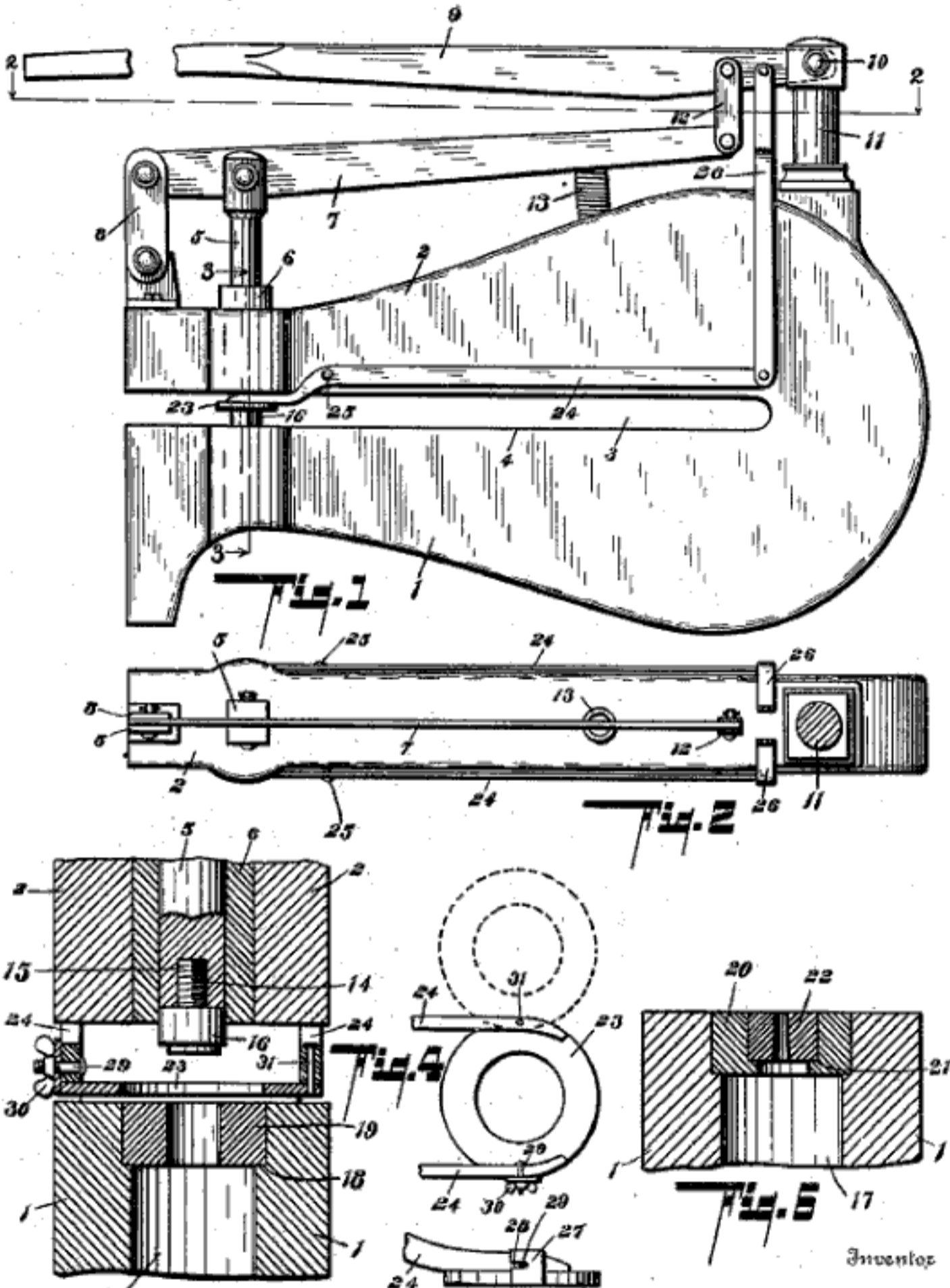
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