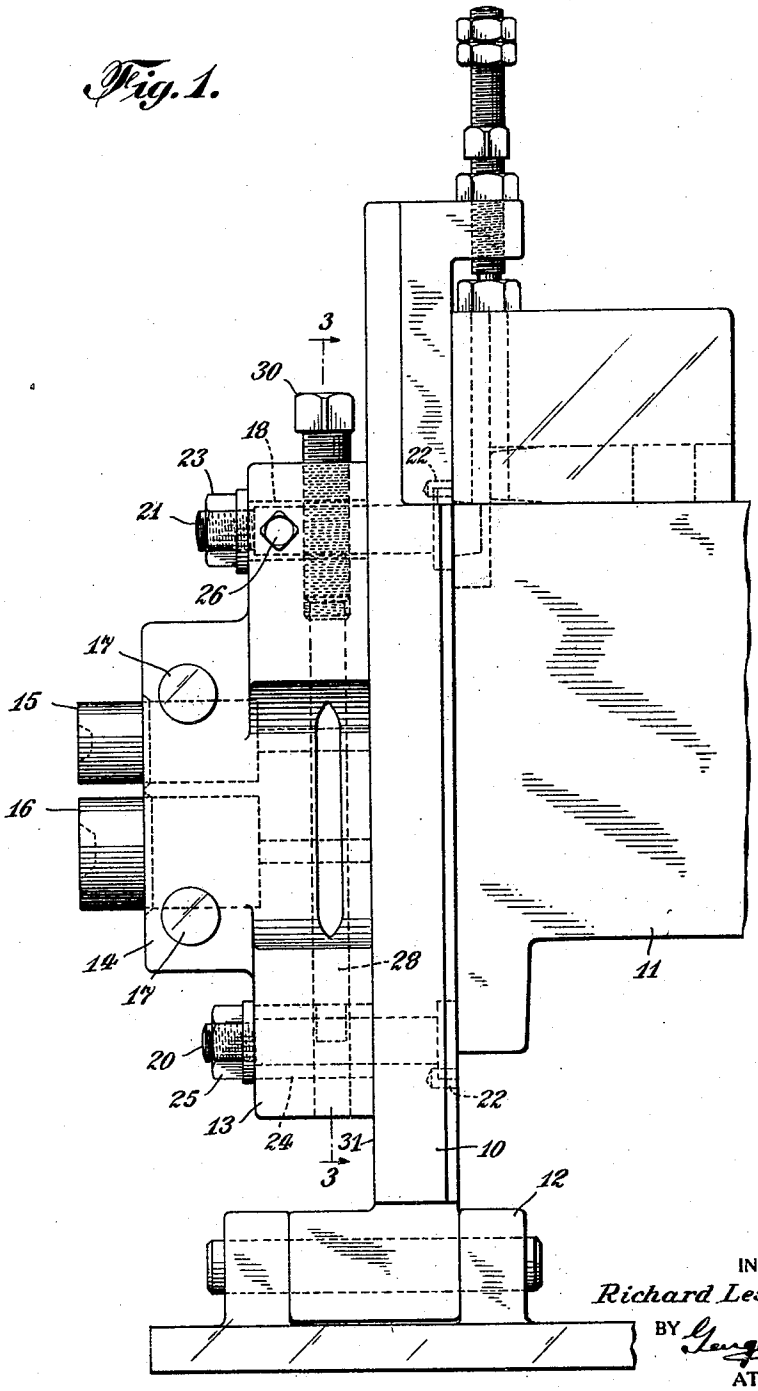
Nov. 26, 1929. R. L. WILCOX 1,737,443

PUNCH HOLDER MECHANISM

Filed May 7, 1926 2 Sheets-Sheet 1

Fig. 1.




INVENTOR
Richard Lester Wilcox
BY George E. Hall
ATTORNEY

Nov. 26, 1929. R. L. WILCOX 1,737,443

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Fig. 2.

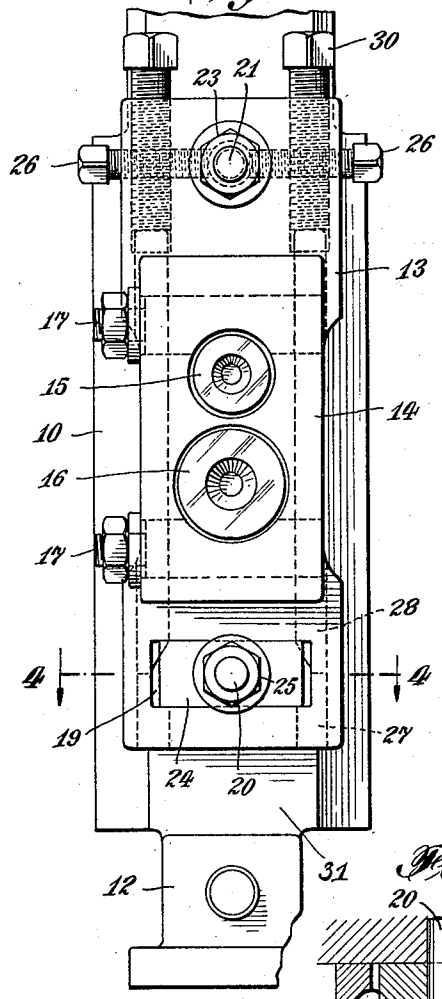



Fig. 3.

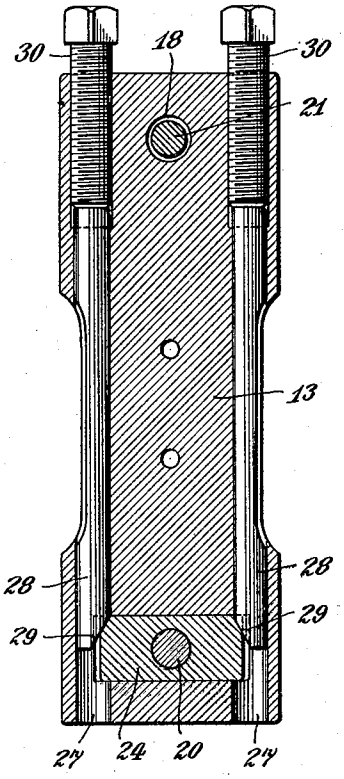
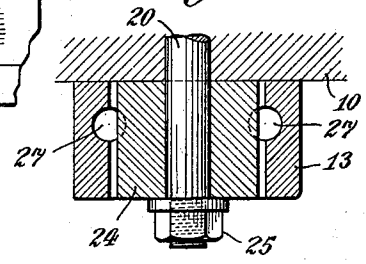



Fig. 4.




INVENTOR

*Richard Lester Wilcox*

BY *George E. Hall*

ATTORNEY

Patented Nov. 26, 1929 1,737,443

# UNITED STATES PATENT OFFICE

RICHARD LESTER WILCOX, OF WATERBURY, CONNECTICUT, ASSIGNOR TO THE WATERBURY FARREL FOUNDRY AND MACHINE COMPANY, OF WATERBURY, CONNECTICUT, A CORPORATION OF CONNECTICUT

## PUNCH-HOLDER MECHANISM

Application filed May 7, 1926. Serial No. 107,331.

This invention relates to a new and improved punch holder mechanism of the type commonly used in heading, upsetting machines or the like.

It is the object of this invention, among other things, to provide a mechanism of this character, wherein its relative position may be varied with the maximum facility and minimum inconvenience; that will withstand great strains and shocks without breaking or crushing; and will be self-contained, that is, the adjustment mechanism, etc., associated with the punch holder rather than with adjacent mechanism.

To these, and other ends, my invention consists in the punch holder mechanism, having certain details of construction and combinations of parts, as will be hereinafter described and more particularly pointed out in the claims.

Referring to the drawings, in which like numerals of reference designate like parts in the several figures;

Figure 1 is a side elevation of my new and improved punch holder mechanism;

Figure 2 is a front view of a portion thereof;

Figure 3 is a sectional view, taken generally upon the plane indicated by line 3—3 in Figure 1; and

Figure 4 is a sectional plan view of a portion thereof, taken generally upon the plane indicated by line 4—4 of Figure 2.

This type of mechanism is used to hold the punches of a header, upsetting machine or the like. It generally moves in two paths, one toward and away from the work piece, and the other at substantially a right angle thereto, so that the punches may be successively presented in line with the work piece with which it is brought into contact during the operations of the machine.

It is essential that this type of device be both rigid and strong to withstand the severe shocks and strains to which it is subjected, and at the same time permit of very fine adjustments in substantially all directions, so as to insure alignment of the punches with the work piece as presented for operations thereon.

With such mechanisms now in common use their structure has such inherent weaknesses that the parts not only frequently break but sometimes are compressed by the pressure applied thereto, and the means adopted for adjusting the punch holder have in some measure been responsible for such weakness and are more or less complicated and so located as to be practically inaccessible. These, and other objections, to such mechanisms as are now generally in use are overcome in my present invention.

In the embodiment of my invention, as shown and described herein, 10 indicates the punch slide, which has a vertical movement relatively to the reciprocatory gate 11, transmitted through the plate 12 by mechanism, not shown, and constituting no part of this invention.

The punch holder 13 is constructed of a single block of metal, having a projecting lug 14 upon one face, within which are secured the punches 15 and 16 by the key bolts 17, or the like. Near the upper end of the die holder is an aperture 18, usually cylindrical in form, and at the bottom a rectangular slot 19.

This punch holder is connected with the slide by the studs 20 and 21, both of which pass through openings in the slide and held against rotation by suitable dowels 22. The shank of the stud 21 is of less diameter than the aperture 18 and upon the outer end thereof is a nut 23 having a washer formed integral therewith, or separably, as may be desired.

The stud 20 passes through an opening in the block 24, which latter is received within the slot 19 to permit the punch holder to slide relative thereto, and has a nut 25 upon the outer end thereof.

Threaded through each side of the die holder are the screws 26, the inner ends of which impinge against the shank of the stud 21.

Within the openings 27, which are arranged substantially parallel with each other, are the adjusting rods 28—28 the inner lower ends of which are beveled as at 29, and engage similar beveled faces in the two upper corners of the block 24, substantially as shown in Figure 3. Threaded into each of these openings,

near its upper end is a screw 30, the lower end of which contacts with the upper end of the rods 28.

The die holder is assembled with the slide by means of the studs 20 and 21 substantially as shown in Figure 1, being held tightly against the face of the slide by the nuts 23 and 25, respectively. As thus associated with the slide, the holder may be moved laterally relatively thereto substantially at right angles to the axis of the rods 28 or in either one or both of two arcs, as may be desired or necessary to bring the punches into a proper aligned position.

To move the punch holder laterally substantially at right angles to the axis of the rods 28, the screws 26 are loosened, then the screws 30, thus releasing the pressure of the rods 28 upon the block 24. Then one of the screws 30 is moved downwardly to apply pressure to the block 24 and this causes the punch holder to travel in a lateral path. When the required adjusted position is obtained, the screw 30 associated with the rod 28, not heretofore adjusted, is tightened, and the screws 26 are brought into contact with the stud 21, thus locking the punch holder in its new position. The punch holder is moved in a limited circular path by manipulation of the screws 26, the center of this arc being the axis of the stud 20. A similar circular movement may be obtained about the axis of the stud 21, by keeping the inner ends of the screws 26 against the stud 21 and then manipulating the screws 30.

With this structure, all the parts that require manipulation for the purpose of adjustment, that is, the screws 26 and 30, are at the upper end of the punch holder where they are readily accessible to the machine operator.

The punch holder, as shown, has a smooth flat back, as well as the face of the slide, and without an intermeshing engagement, one with the other, hence the punch slide may be made of a very hard flat piece of metal which requires but little tooling to finish and has no opening through its face to receive projecting portions of the punch holder to weaken it as in the slides heretofore generally made. As a result of these differences this punch slide will withstand a very substantially greater pressure than has heretofore been possible with the old type of punch slide. Hence, with merely the substitution of my improved punch holder mechanism, the same machine will operate upon material of greater hardness and larger diameter than with the old type of such mechanism, without breakage or compression of the parts, and with the minimum loss of time and inconvenience in acquiring the required adjustments.

It will also be seen that the slide, as shown in Figure 1, has a solid pressure-receiving face 31 disposed opposite to the punches and rearwardly thereof. It will further be noted that the adjusting means is carried substantially wholly by the holder, the rear ends of the studs 20 and 21 extending only into the slide.

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

1. In mechanism of the character described; a punch holder having therein one or more punch recesses, a slot and an aperture; a block within the slot; adjusting rods movably mounted in the punch holder by threaded means adjacent to the top thereof, which rods are upon opposite sides of the recesses and engage said block, and move the punch holder laterally upon the block, a slide; and means, as bolts, connected with said slide, one of which projects through said aperture and the other through an opening in the block, having nuts thereon for securing the holder to the slide, that portion of the slide adjacent to the punch holder being solid, except for the openings therethrough for said bolts.

2. A punch holder having therein punch retainig means, a slot and an aperture; a block within the slot; and means within the punch holder engaging the block for moving the punch holder upon the block; rotating members for actuating said means; a slide, and means, as bolts, for securing the punch holder to the slide, the face of the punch holder adjacent to the slide being straight without openings therein except said slot and aperture and the face of the slide being straight and solid, without openings therein except those provided for the bolts.

3. In mechanism of the character described; a punch holder having one or more punch retainig means, a slot and an aperture; a block within the slot; means connected with the punch holder and engaging the block for moving the punch holder laterally; a slide; bolts connected with the slide, one of which projects through the block and the other through the aperture, the cross sectional area of this latter bolt being less than the aperture; and screws threaded into the holder upon opposite sides of and engaging the bolt within the aperture to move the punch holder relatively to the bolt and securing the same in its adjusted positions.

4. In mechanism of the character described; a slide; companion bolts connected with and projecting from one face thereof; a block journaled on the projecting portion of one of said bolts in advance of the face of the slide; a punch holder having a slot therethrough to receive the block and an aperture therethrough to receive the other bolt; and means connected with the punch holder for moving the same relatively to the axis of the bolt upon which the block is journaled.

5. In mechanism of the character described; a slide; companion bolts connected with and projecting from one face thereof; a block journaled on the projecting portion

of one of said bolts in advance of the face of the slide; a punch holder having a slot therethrough to receive the block and an aperture therethrough to receive the other bolt, said aperture being of greater cross sectional area than that of the bolt; and means connected with the punch holder for moving the same relatively to the axis of the bolt upon which the block is journaled.

6. In mechanism of the character described; a punch holder having therein one or more punch recesses, a slot and an aperture; a block within the slot; adjusting rods mounted in the punch holder upon opposite sides of the recesses, which engage said block; threaded means engaging the rods adjacent to the top thereof, for adjusting the rods, and the punch holder laterally upon the block; a slide; and means as bolts, connected with said slide, one of which projects through said aperture and the other through an opening in the block, having nuts thereon for securing the holder to the slide.

7. In mechanism of the character described; a punch holder having therein one or more punch recesses, a slot and an aperture, the slot being below said recesses, and the aperture upon the opposite side of the recesses; a block within the slot; means for adjusting the punch holder, that is in part movably mounted in the punch holder upon opposite sides of the recesses; threaded means in and adjacent to the top of the punch holder for imparting movement to said adjusting means; a slide; and means, as bolts, connected with said slide, one of which projects through said aperture and the other through an opening in the block, having nuts thereon for securing the holder to the slide.

8. In mechanism of the character described; a punch holder having therein one or more punch recesses, a slot and an aperture; a block within the slot; adjusting rods movably mounted in the punch holder upon opposite sides of the recesses; threaded means adjacent to the top of said rods which engage and through their engagement move the punch holder laterally upon the block; a slide; and means, as bolts connected with said slide, one of which projects through said aperture and the other through an opening in the block, having nuts thereon for securing the holder to the slide, that face of the slide adjacent to and in contact with the punch holder being solid opposite the punch recesses.

9. In combination with a punch holder, and a punch carried thereby; a slide having a solid pressure receiving face disposed opposite to the punch and rearwardly therefrom and means to attach the punch holder to the slide and to effect adjustment of the punch holder on the slide, said adjusting means being carried substantially wholly by the punch holder and upon opposite sides of the punch therein.

10. In combination with a punch holder, and a series of punches carried thereby; a slide, means carried substantially wholly by the punch holder to effect adjustment of the punch holder on the slide; and means to attach the punch holder to the slide, said slide having a substantially solid pressure receiving face disposed opposite to the punches and rearwardly thereof and said punch holder having a solid pressure receiving face disposed opposite to said face of the slide.

11. In combination with a punch holder having a substantially solid pressure receiving face and a punch carried thereby; a slide having a solid pressure receiving face disposed opposite to the punches and rearwardly thereof; members connected with the slide and extending beyond the pressure receiving face of the slide, one member projecting through an opening in the punch holder of larger cross sectional area than said members; a block having an opening therethrough that receives another of said members and is slidable in the punch holder and spaced from the punch; means carried by the punch holder to shift the position of the block within the punch holder; and means, carried by the punch holder, that co-operate with the member in the said opening in the punch holder to cause relative movement of the punch block on the slide.

12. In combination with a slide; a punch holder having punch retaining means and having an aperture and a slot, both spaced from the punch retaining means; a block slidable in the slot and having an opening; means extending through the aperture and opening to connect the punch holder to the slide, the aperture being of a size to permit movement of the punch holder relative to the slide; and means carried by the punch holder to effect adjustment thereof relative to the slide and about the means which extends through the block as a fulcrum.

In testimony whereof, I have hereunto affixed my signature.

RICHARD LESTER WILCOX.