

June 3, 1941.

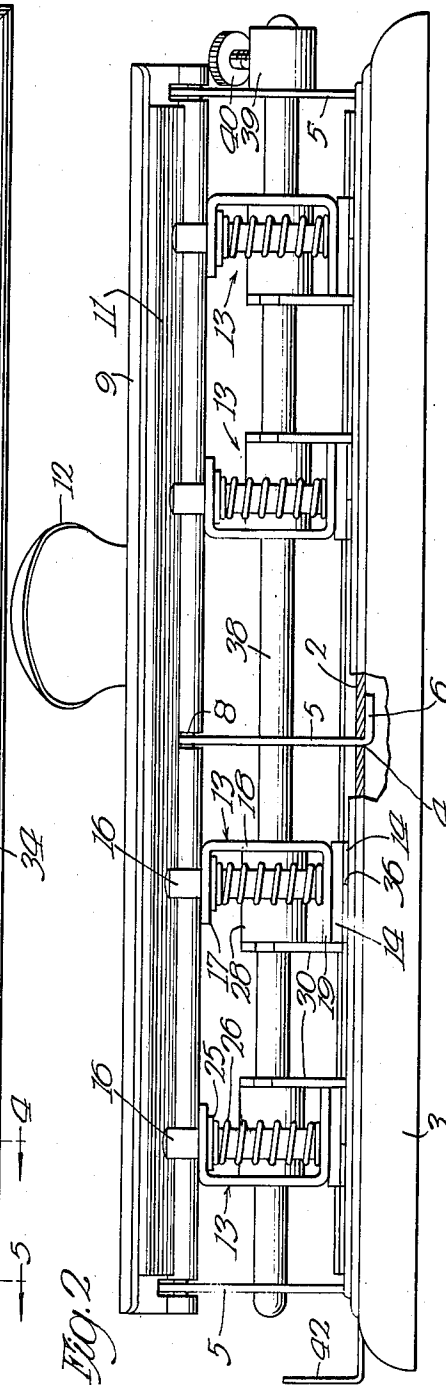
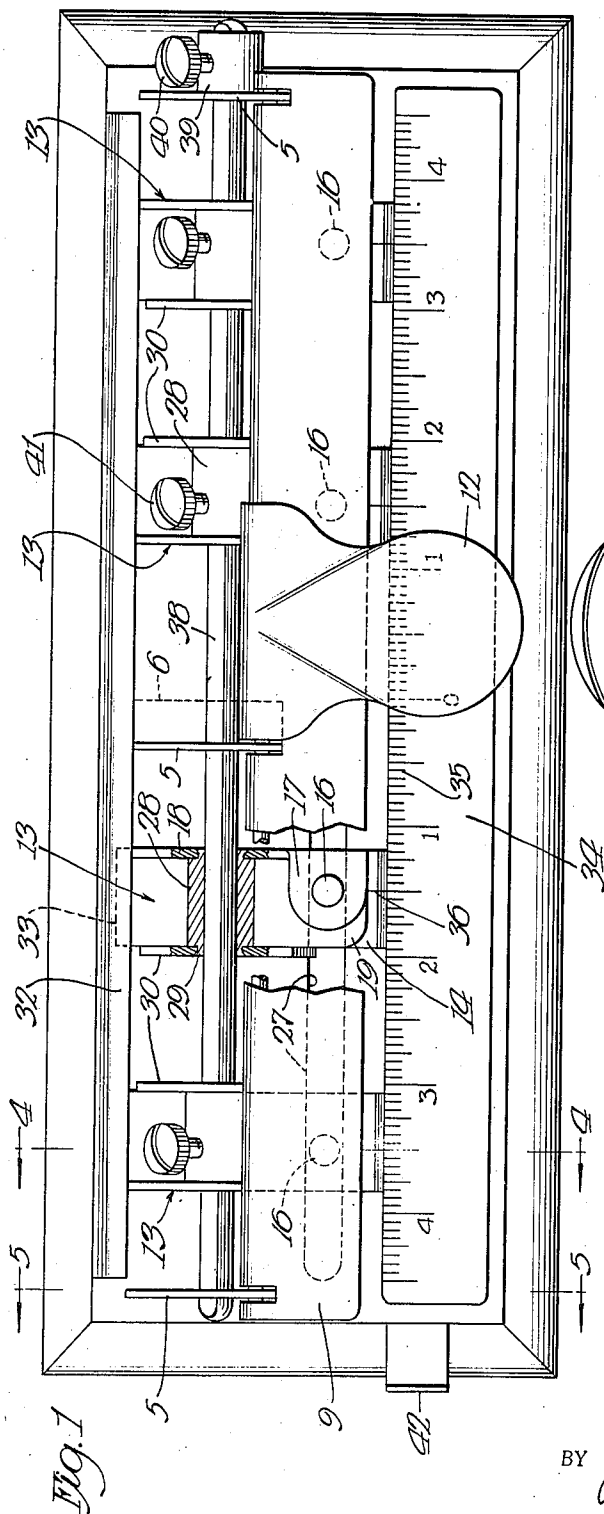
P. O. UNGER

2,244,320

PUNCH

Filed Nov. 18, 1939

2 Sheets-Sheet 1



INVENTOR.

INVENTOR.
Paul O. Unger

BY

Benjamin Schlosser
ATTORNEY.

ATTORNEY.

June 3, 1941.

P. O. UNGER

2,244,320

PUNCH

Filed Nov. 18, 1939

2 Sheets-Sheet 2

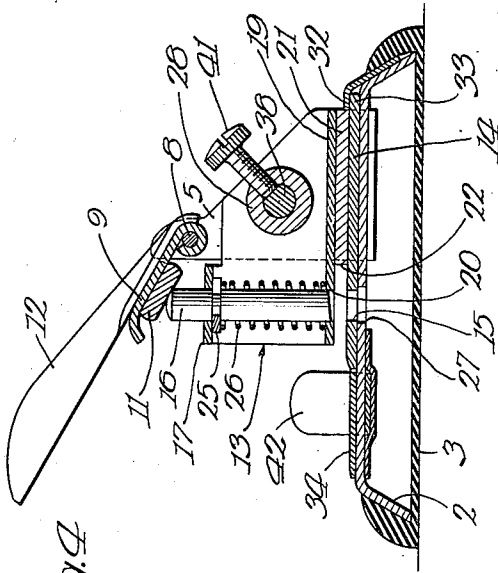


Fig. 4

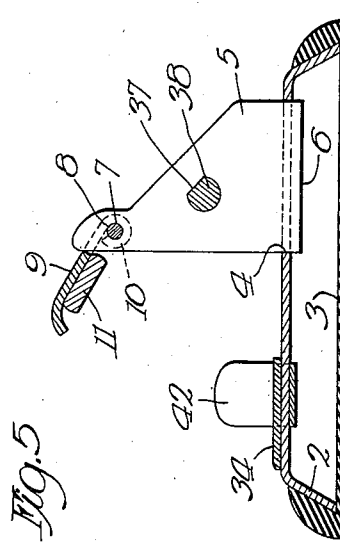


Fig. 5

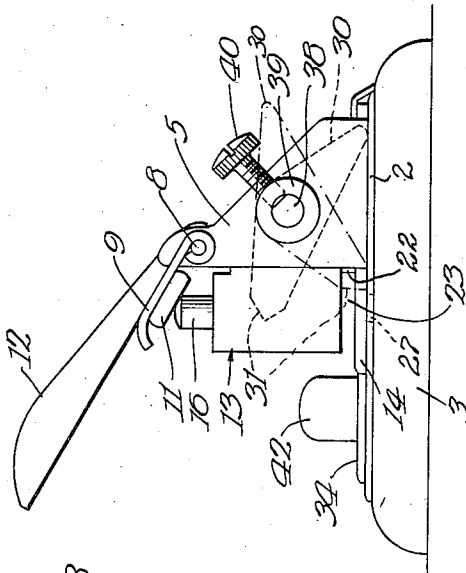


Fig. 3

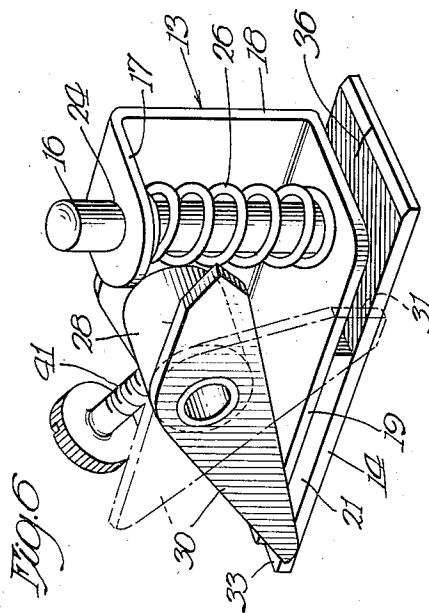


Fig. 6

INVENTOR.
Paul O. Unger
BY *Benjamin Schlosser*
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,244,320

PUNCH

Paul O. Unger, Elmhurst, Ill., assignor to Wilson-Jones Company, Chicago, Ill., a corporation of Massachusetts

Application November 18, 1939, Serial No. 305,064

8 Claims. (Cl. 164-91)

This invention relates to a punch for perforating loose sheets of paper or similar material so that they may be inserted into a loose leaf binder. The punch is also designed to perforate file folders to receive conventional paper fasteners.

It is customary to provide a uniform back gauge of approximately $\frac{1}{8}$ " when punching sheets which are to be impaled on the prongs of a ring binder or of a fastener secured to a file folder. However, it is desirable to provide a deeper back gauge of approximately $\frac{1}{2}$ " for perforating file folders. This is necessary because of the width of the conventional paper fastener. Although a choice of two back gauges of approximately the distances mentioned is sufficient for practically all punching requirements, all back gauges previously designed for varying the distance between the perforation and the edge of the punched sheet have been adjustable throughout the range from approximately $\frac{1}{8}$ " to $\frac{1}{2}$ ". The result of such construction is that it has been necessary to exercise considerable care in changing the back gauge from one depth to another in order to obtain uniform performance when punching sheets and file folders on the same punch.

It is an object of this invention to provide a simple and inexpensive punch with back gauges that may change the effective depth of the throat of the punch from either of two predetermined distances to the other with a minimum of effort and no possibility of error. It is a further object of this invention to provide a punch with interchangeable punch heads that may be adjusted laterally, inserted, or removed, very quickly. Other objects of this invention will become apparent upon reading the following description, taken in conjunction with the accompanying drawings, in which:

Figure 1 is a top plan view of the punch with parts broken away to facilitate illustration of the structure;

Figure 2 is a front elevation of the punch with parts broken away to facilitate illustration of the structure;

Figure 3 is a side elevation of the punch;

Figure 4 is a cross sectional view taken along the line 4-4 of Figure 1;

Figure 5 is a cross sectional view taken along the line 5-5 of Figure 1; and

Figure 6 is a detailed perspective view of one of the punch heads.

In the drawings, the reference numeral 2 indicates a base member provided with a removable chip pan 3. In the preferred embodiment the chip pan is formed of rubber shaped to cling to the depending walls of the base member, but any desired type of chip pan may be used instead. The base member is provided with a plurality of slots 4. An upstanding bracket 5 projects thru

each of these slots and has a flange 6 welded to the under surface of the base member.

Each bracket 5 is provided with an aperture 7 adjacent its top edge to receive a hinge rod 8 by means of which a pressure bar 9 is pivotally secured to the bracket. One edge of the pressure bar 9 is curled to form a hinge ferrule 10 adapted to receive the hinge rod 8. The pressure bar 9 is provided with a reinforcing plate 11 welded or riveted to its under surface. A handle 12 of any suitable configuration is welded to the top surface of the pressure bar 9. The handle 12 may be formed integrally with the pressure bar, if desired. The handle 12 is preferably disposed centrally of the pressure bar to equalize the stresses when the pressure bar is operated.

A plurality of punch heads 13 is positioned on the base member between the brackets 5. Each punch head comprises a die plate 14 provided with an aperture 15 of any desired size and shape. A punching pin 16 of the same size and shape as the aperture 15 is supported vertically over the aperture 15 by means of a frame member having a top wall 17, a side wall 18 and a bottom wall 19. The bottom wall 19 is provided with an aperture 20 in registration with the aperture 15 and functions as a stripper plate. A spacer 21 is positioned between the die plate 14 and the stripper plate 19. The forward edge 22 of the spacer constitutes the back of the throat 23 into which the sheets to be punched are inserted, and limits the insertion of such sheets to provide the desired maximum distance between the perforations and the edge of the sheet.

The top wall 17 is bent parallel to the stripper plate 19 and is provided with an aperture 24 in registration with the apertures 15 and 20. The punching pin 16 is positioned in the apertures 20 and 24 and is provided with a collar 25 rigidly secured thereto in any suitable manner. A coil spring 26 encircles the punching pin 16 between the stripper plate 19 and the collar 25 to exert constant pressure urging the collar 25 against the upper wall 17 of the frame member. The upper end of the punching pin 16 is positioned directly underneath the reinforcing plate 11 so that when the handle 12 is depressed the punching pin is forced downwardly against the action of the spring 26 until its cutting end projects thru the sheets and into the die aperture 15. Upon release of the handle 12 the spring 26 forces the punching pin upwardly so that the punched sheets may be removed.

The base member 2 is provided with a slot 27 extending throughout substantially its entire length and positioned in alignment with the apertures 15 so that the chips may fall there-through into the chip pan 3.

A bushing 28 is secured to the side wall 18 and extends a distance substantially equal to the

width of the punch head. The bushing is provided at its end with a reduced neck 29 upon which a lever 30 is pivotally secured. The lever 30 is parallel to the wall 18 and fits against the edge of the plates 14 and 19. One edge 31 of the lever is shaped so as to provide a perpendicular wall when the lever is moved downwardly to the position indicated in dotted lines in Figure 6. In this position the edge 31 effectively closes a portion of the throat 23 and limits the insertion of the sheets to provide the predetermined back gauge. The edge of the lever 30 adjacent the edge 31 which engages the top surface of the base member 2 when the lever is in its down position extends at right angles to the edge 31 to insure proper positioning of the edge 31 as a shorter gauge for the throat 23. The base member 2 is imperforate throughout the area where it may be engaged by the edge of the lever 30.

The base member 2 is provided with a flange 32 spaced a short distance above the rear edge of the base. The die plate 14 projects beyond the spacer 21, as indicated at 33, and this portion 33 is positioned between the flange 32 and the top of the base member 2 when the punch head is to be positioned in the punch. The front edge of the die plate 14 merely abuts against a plate 34. The plate 34 is provided with a scale 35 adapted to cooperate with a gauge mark 36 on the front edge of the die plate to facilitate proper lateral positioning of the punch head.

The brackets 5 are each provided with a D-shaped aperture 37 adapted to register with the apertures of the bushings 28 when the punch heads are in the above described position. A D-shaped rod 38 is passed through the apertures in the brackets and the bushings to maintain the punch heads in lateral alignment. One end bracket is provided with a bushing 39 and a set screw 40 to maintain the rod 38 in position. Each bushing 28 is also provided with a set screw 41 to maintain the punch heads in desired lateral position. Although the punch heads may all be exactly alike, it is preferred to provide rights and lefts, as indicated in Figure 2, to prevent any possibility of the brackets 5 interfering with any desired lateral spacing of the punch heads. The punch is also preferably provided with a sliding side gauge 42 of any desired construction.

When it is desired to remove a punch head from the punch it is necessary only to loosen the set screws 40 and 41 and pull the rod 38 out far enough to disengage the punch head. The front edge of the punch head may then be raised slightly to disengage the front edge of the die plate 14 from its abutting engagement with the die plate 34, and the punch head may be removed without difficulty. When it is desired to change the back gauge from one depth to the other it is necessary only to flip each lever 30 from one position to the other and there is no possibility of any error in the final adjustment.

Although I have described one embodiment of my invention in considerable detail, it will be understood that the description thereof is illustrative rather than restrictive as many details may be modified or changed without departing from the spirit or scope of the invention. Accordingly, I do not desire to be restricted to the exact details of construction described except as limited by the appended claims.

I claim:

1. In a punch, a base member, a plurality of upstanding brackets secured to said base member, a plurality of removable punch heads positioned on said base member, each of said punch heads having a pivoted back gauge secured thereto, and a rod passing through said brackets and said punch heads to maintain said punch heads in lateral alignment.

2. In a punch, a base member, a plurality of brackets projecting upwardly from said base member, said brackets being provided with a D-shaped aperture, a plurality of punch heads positioned on said base, each of said punch heads having a bushing, a D-shaped rod passing through said bushings and said D-shaped apertures to maintain said punch heads in lateral alignment, each of said punch heads including a punching pin, and a pressure bar pivotally secured to said brackets and operable to depress said punching pins.

3. In a punch, a base member, a plurality of punch heads positioned on said base, each of said punch heads being provided with a punching pin and a back gauge, said back gauge being pivoted to provide a choice of only two positions, means for adjustably maintaining said punch heads in lateral alignment, and a pressure bar pivoted above said punch heads and extending substantially the length of said base member, said pressure bar being operable to depress said punching pins.

4. In a punch, a base member, a plurality of removable punch heads positioned on said base member, each of said punch heads including a die plate, a punching pin, a frame member supporting said punching pin above said die plate, a spacer providing a throat between said die plate and said frame member, said spacer providing a fixed back wall for said throat, and a pivoted lever forming an alternative back wall for said throat in one position, a pressure bar pivoted above said punching pins, and a D-shaped rod adapted to maintain said punch heads in proper position, said punch heads being removable upon withdrawal of said rod.

5. In a punch head, a throat into which sheets to be punched may be inserted, said throat having a fixed back wall to limit the distance to which sheets may be inserted, and movable means secured to said punch head to limit the insertion of sheets into said throat a different predetermined distance, said means permitting no intermediate adjustments.

6. In a punch head, a throat into which sheets to be punched may be inserted, said throat having a fixed back wall adapted to limit the depth to which sheets may be inserted, and a lever secured to said punch head and operable to modify the effective length of said throat one predetermined distance only.

7. In a punch head, a throat into which sheets to be punched may be inserted, a frame member positioned above said throat, a back gauge pivoted to said frame member so as to block a predetermined portion of said throat.

8. In a punch head, a die plate, a frame member, a spacer separating said die plate and said frame to provide a throat into which sheets to be punched may be inserted, and a lever pivoted to said frame member and operable to block a portion of said throat to limit the distance a sheet may be inserted.

PAUL O. UNGER.