April 16, 1940. W. RUTHVEN 2,197,349

PUNCH SUPPORT

Filed June 3, 1939

FIG. 1

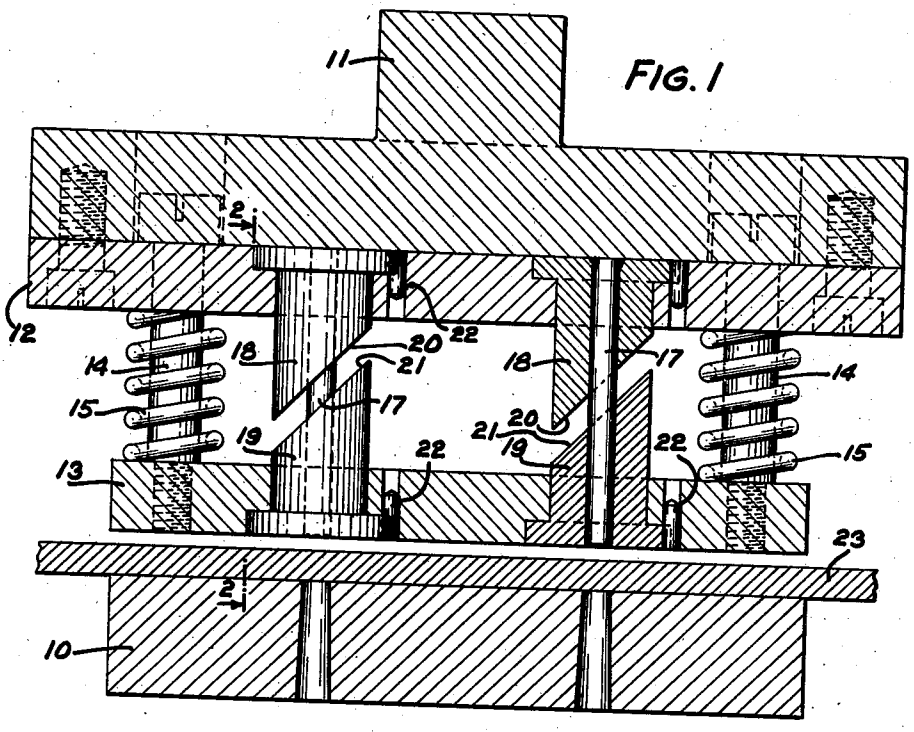


FIG. 2

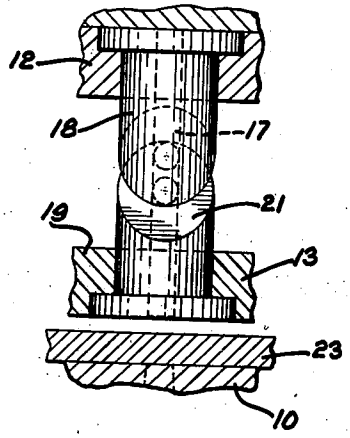
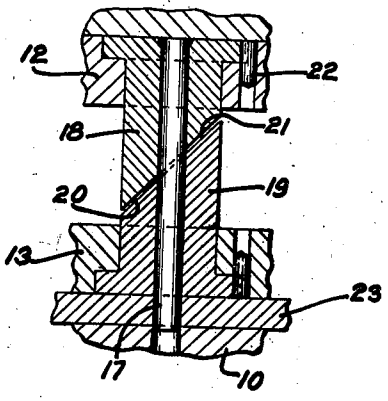


FIG. 3



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PUNCH SUPPORT

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6 Claims. (Cl. 164—124)

This invention relates to supporting means for punches or perforators and particularly to supporting means for punches or perforators of relatively thick materials.

The thickness of material that can ordinarily be punched is commonly limited to the diameter of the punch for all practical purposes. It is common knowledge that punches or perforators will bend or break if an attempt is made to punch holes or apertures in materials of a thickness greater than the diameter of the punch because the punch is usually not supported sufficiently.

The object of this invention is to overcome these objectionable features in punches or perforators and to provide an efficient supporting means for the punch or perforator which will permit punching or perforating of material of a considerably greater thickness than the diameter of the punch without complicating in any way the common method of operating the same.

In attaining these objects encircling sleeves or supports are provided for the punch which support the same substantially its entire length and circumference during the punching operation.

Other objects and advantages of the invention will be understood by reference to the following specification and accompanying drawing, in which:

Fig. 1 is a sectional view of a punching mechanism in which two punches supported in accordance with this invention are shown;

Fig. 2 is a view taken on line 2—2 of Fig. 1, and

Fig. 3 is a sectional view of a punch and support at the completion of the perforating or punching stroke.

In the drawing, the usual simple form of punching mechanism is shown by way of illustration. Referring to Fig. 1, the dies and die block are indicated at 10. The reciprocating punch holder 11 is provided with a securing plate 12 and a stripper plate 13 slidably secured to the holder 11 by means of bolts 14 passing through coiled springs 15 adapted to force the stripper plate 13 in its extended position.

The support for the punch or perforator 17 is preferably constructed of two sleeves or sectional supports 18 and 19 substantially surrounding the punch or perforator throughout its length. The sleeves or sections 18 and 19 are separated from each other by overlapping opposing cooperating spaced surfaces 20 and 21 formed at an angle to the center line of the punch or perforator.

It has been found that the angular separation of the sleeves or sections 18 and 19 can be varied to give satisfactory results. The angle of the separating surfaces to the center line of the punch depends upon the length of the stroke desired and the thickness of the materials to be punched or perforated.

The degree of the angle of the separating surfaces 20 and 21 is selected so that the sleeves or supports 18 and 19 will each encircle, at these surfaces, approximately one-half of the punch or perforator 17 at substantially diametrically opposite positions thereof prior to the starting of the punching or perforating stroke of the punch holder 11. The extent of separation along the center line of the punch or perforator 17 of the sleeves or supports 18 and 19 at this time also determines the length of the punching or perforating stroke. It will be readily seen that the opposite semi-circular radial support of the punch at the separation of the upper and lower holders 18 and 19 will provide encircling radial support for the punch at the separation of the supports. The remaining base portions of the supports 18 and 19 provide radial support for the remaining length of the punch 17, thus assuring support for the punch 17 throughout its entire length and the entire stroke of the punch.

The supports 18 and 19 are illustrated as being circular in cross-section and as will be seen in the drawing this form of holder would require that the holders be prevented from rotating in their mounting and for this purpose locking pins 22 are provided. It is not necessary to limit these holders to cylindrical cross-section however.

The punch mechanism as shown in Fig. 1 is at the top position or about to start its punching or perforating stroke to punch or perforate material 23. The stripper plate 13 with the lower half 19 of the sleeves or supports attached thereto is in its lowermost position. In this position the sleeves or supports 18 and 19 are at the maximum separation with substantially one-half the circumference of the punch or perforator 17 surrounded and radially supported by sleeve 18 and the opposite half of the circumference of the punch or perforator 17 in substantially the same horizontal plane surrounded and radially supported by the sleeve 19. Upon downward movement of the punching mechanism the stripper plate 13 contacts the material 23 to be punched as the punch or perforator enters the material. The mechanism as it continues downwardly causes the space between surfaces 20 and 21 to progressively diminish, providing progressively increasing support to the punch or perforator 17 as the punch-

ing or perforating force increases until the punching or perforating has been completed as shown in Fig. 3.

While the invention is illustrated and described more particularly with reference to supports for punches or perforators, the invention is not confined thereto but is intended to cover any other uses or modifications within the scope of the appended claims.

What is claimed is:

1. In a punch mechanism, a punch, and solid supporting members encircling said punch separated from each other by opposed overlapping surfaces.

2. In a punch mechanism, a punch, and supporting members encircling said punch spaced from each other by opposed surfaces disposed at an angle to the center line of the punch.

3. In a punching mechanism, a punch and two supporting members separated from each other at an angle to the center line of the punch.

4. In a punching mechanism, a punch, and two supporting members encircling said punch separated from each other at an angle to the center line of the punch.

5. In a punching mechanism, a punch, and two encircling overlapping supporting members to radially support the punch during the entire stroke of the punch spaced from each other at an angle to the center line of the punch.

6. In a punching mechanism, a punch, and two supporting members having opposed surfaces spaced at an angle to the center line of the punch, each member at its angular surface supporting half the circumference of the punch in the same horizontal plane so that the two members together in this plane entirely encircle the punch to radially support the same.

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