C. W. DUNLAP.

PUNCHING MACHINE.

APPLICATION FILED MAY 11, 1917.

1,279,851. Patented Sept. 24, 1918.

Fig. 1.

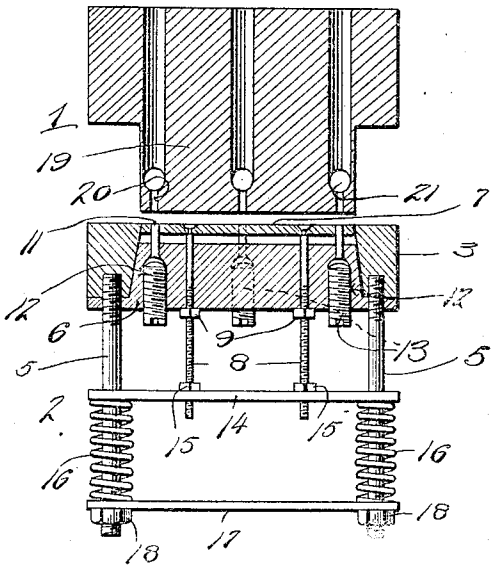
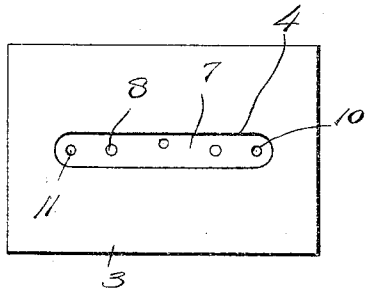


Fig 2.



WITNESSES

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PUNCHING-MACHINE.

1,279,851. Specification of Letters Patent. **Patented Sept. 24, 1918.**

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To all whom it may concern:

Be it known that I, CHARLES W. DUNLAP, a citizen of the United States, residing at Nicholson, in the county of Wyoming and State of Pennsylvania, have invented certain new and useful Improvements in Punching-Machines, of which the following is a specification.

This invention relates to an improvement in punching machines, and more particularly to a device for piercing or cutting holes in light sheet metal pieces at the same time they are blanked out, and which device can be constructed to be fitted and used in conjunction with a punching press of standard form and construction.

An object of my invention is to provide a device or apparatus of the character described which has the parts thereof so constructed that they may be mounted in conjunction with the fixed and movable parts of a punch press so that as stock is fed into and operated upon by the press, the punching mechanism will be rendered operative to cut the openings at the desired point.

A further object resides in providing a work supporting or guide plate which is so arranged that the work or the parts to be operated upon are placed thereon and will be maintained at all times in substantially the same position in so far as movement of this plate may be concerned, the plate having movement only when the parts carried thereby are under holding pressure.

Yet another object is to so construct the device that adjustment may be made to adapt the mechanism for operation upon various conditions and characters of material, and further, in making provision for the discharge of any punchings, or cuttings at such a point that they will be carried beyond the work supporting plate and out of the range of operation for the working parts.

With the above and other objects in view which will be in part described and in part understood from the specification, drawings, and claims, my invention consists in certain novel features of construction and combinations of parts which will be hereinafter more fully set forth.

In the drawings:—

Figure 1 is a view partly in elevation and partly in section to show the construction and coöperative mounting of the parts; and,

Fig. 2 is a view in plan looking down on the guide or work supporting plate.

The mechanism might be said to consist of two main parts or portions, the portion 1 which will be hereinafter referred to as the punch, and the portion 2, to be referred to as the guide. In the present disclosure I have shown an adaptation of the mechanism of my invention in conjunction with the parts of a punch press to be used in blanking out or punching plates to be used in the construction of handles for pocket knives and it will of course be understood that the description will be accordingly specifically limited to attachment to construction with this particular form of press, in some parts, although it will be appreciated that the present adaptation is only one which might be resorted to in the mounting and use of the mechanism of my invention.

The body 3 of the guide has an opening 4 formed therethrough of a shape desired for the blank, and as is shown in Fig. 1, it is preferable that this opening be made slightly tapered or widened out in its inner extent to thus give a cleaner cut as substantially a shearing edge is provided. It is to be understood that the body 3 will be given a more or less rigid mounting and hanger rods 5 are connected with the body to depend therefrom, these hanger rods being disposed in parallel relation, and screw threaded at their lower ends. A block 6 is made of such size that it will fit within the tapered opening of the body 3 from the lower side, it however not being made sufficiently small that the upper face will be flush with the face of the body 3. This block 6 is rigidly mounted in the lower portion of the opening in the body 3, and thus a recess is left above it. A guide plate 7 is made of such size that it will fit within the opening and this plate is of somewhat less depth than the depth to which the face of the block 6 is sunk below the face of the body 3, so that the guide plate can be moved to have the upper face thereof in a plane with the top face of the body member 3 or can be depressed to have the face below the top face.

Push rods 8 are mounted through suitable openings provided through the block 6 to thus be capable of endwise sliding movement, and at the upper ends these push rods are riveted or otherwise secured in conjunction with the guide plate 7, the plate being

virtually mounted upon and carried by these push rods. The lower ends of the push rods are screw threaded and adjusting nuts 9 are provided thereon to be set to govern the distance to which the push rods may be extended through the block 6, and thus make it possible to bring the upper face of the plate 7 to the proper relative position with respect to the face of the body 3. The guide plate 7 has guide openings 10 formed therethrough at points corresponding to the desired location of the openings to be punched or pierced through the metal sheet which is to be acted upon, and piercing punches 11 are mounted in suitable openings 12 within the block 6 to be received in the guide openings 10 of the plate 7, adjusting or set screws 13 being provided to hold these piercing punches in the proper mounting and to adjust the same to have the proper extension above the top face of the block 6.

A cross head 14 is mounted upon the hanger rods 4 and 5, to be capable of movement thereon and is provided with openings through which the screw threaded ends of the push rods 8 are received, nuts 15 being mounted on the rods 8 to bear against the upper side of the cross head 14. Coil springs 16 are mounted around the hanger rods 4 and 5 and a cross bar 17 is mounted over the screw threaded ends of the hanger rods 4 and 5 to provide a bearing plate for the lower ends of the coil spring 16, nuts 18 being turned onto the ends of the hanger rods to hold this cross bar 17 against displacement. By position of spring 16, the cross head 14 is normally urged upwardly, and through the fact that the nuts 15 on the push rods 8 bear against the upper side of this cross head 14, the push rods 8 are urged to slide through the bearings provided therefor in the block 6, and consequently the plate 7 is raised from a position of bearing against the upper side of the block 6, movement of the push rods 8, however being limited by the adjusting nuts 9.

The punch block 19 is shaped to have substantially the same form as the opening in the body 3, and as has been intimated is mounted adjacent and substantially in registry with the opening to have movement imparted thereto in line with the line of movement permitted in the push rods 8. This block 19 has openings 20 provided therein in registry with the opening 10 as formed through the plate 7, and discharge openings 21 are branched from these openings 20.

In the use of the mechanism, the parts will be mounted to operate in substantially the usual manner, and by setting of the adjustment nuts 9, the plate 7 will be set substantially in a plane with or slightly below the face of the body 3, the set or adjusting screws 13 also being adjusted to bring the upper ends of the piercing punches into substantially this same plane. The sheet metal or stock to be operated upon is placed upon the upper surface of the body 3 in position to have that part of the stock from which the blank is to be taken over the plate 7. The punch 1 is then brought down through mechanical operating means or through manual actuation and the block 19 thereof bears against the stock and stamps out the blank of the desired form, the plate 7 being pressed against the bearing force exerted by the springs 16, as the block travels down and the blank being thus moved in such a relation that the fixed piercing punches force a plug or blank therefrom up into the openings 20. When the punch member 1 starts on its return movement, the springs 16 urge against the cross head 14 and through the bearing of the nuts 15 thereagainst cause the push rods 8 to be again extended upwardly through the block 6 to such a point that the plate 7 is again elevated to its normal position where the blank is raised from within the opening 4. The scraps cut from the openings punched through the stock will discharge through the openings 21 of the block 19, and thus this scrap will be removed from the work supporting face of the body 3 of the die and will also be prevented from choking the openings 20 of the punch block.

From the foregoing it will be seen that I have provided a punch mechanism which can be used in connection with any suitable form of punch press, and which has the parts thereof so arranged that dies and punch blocks of different shapes and designs can be employed, while at the same time the pierced or punched openings can be made at any desired location within the body of the member as blanked out; and further, that by provision of the movable plate 7 and the parts coöperating therewith, the stock being operated upon will be at all times supported and will upon completion of the stamping and punching operation, be left free upon the work supporting face of the die block.

While I have herein shown and described only certain specific forms and arrangements of the several parts and have set forth only specific ways in which the parts might be mounted, it will of course be understood that a number of changes and variations might be resorted to in the form and arrangement of the several parts without departing from the spirit and scope of my invention, in view of which fact I do not wish to be limited to the exact disclosure but only to such points as may be set forth in the claims.

I claim:

1. In a punching machine, the combination with the punch block having openings through its face and discharge openings

communicating with them and leading laterally therefrom; of a guide member comprising a body provided with an upwardly tapering die-opening, a block secured in the opening beneath the upper face of the body so as to leave a recess, upstanding punches on said block, alined with the openings in the punch block, a plate movable within said recess and having holes through which said punches project, the block being pierced with other upright holes, push-rods playing through the latter and secured to said plate, the lower ends being threaded, nuts on the threaded ends against the lower face of said block for preventing the upward movement of the plate but permitting its downward movement, and yielding means bearing said rods normally upward, for the purpose set forth.

2. In a punching machine, the combination with the punch block having openings through its face and discharge openings communicating with them and leading laterally therefrom; of a guide member comprising a body provided with an upwardly tapering die-opening, a block secured in the opening beneath the upper face of the body so as to leave a recess, upstanding punches on said block, alined with the openings in the punch block, a plate movable within said recess and having holes through which said punches project, the block being pierced with other upright holes, push-rods playing through the latter and secured to said plate, the lower ends being threaded, nuts on the threaded ends against the lower face of said block for preventing the upward movement of the plate but permitting its downward movement, hanger rods pendant from said body, a cross bar connecting their lower ends, spring coiled on said rods above said cross bar, a cross head slidably mounted on said rods above said springs and through which cross head the lower ends of said punch rods project, and nuts on the latter above the cross head for the purpose set forth.

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

CHARLES W. DUNLAP.

Witnesses:
CHARLOTTE E. DECKER,
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."