

Feb. 5, 1946.

A. G. GULLBERG

2,393,986

RETAINER DEVICE FOR DEMOUNTABLE PUNCHES, DIES, AND THE LIKE

Filed Feb. 26, 1944

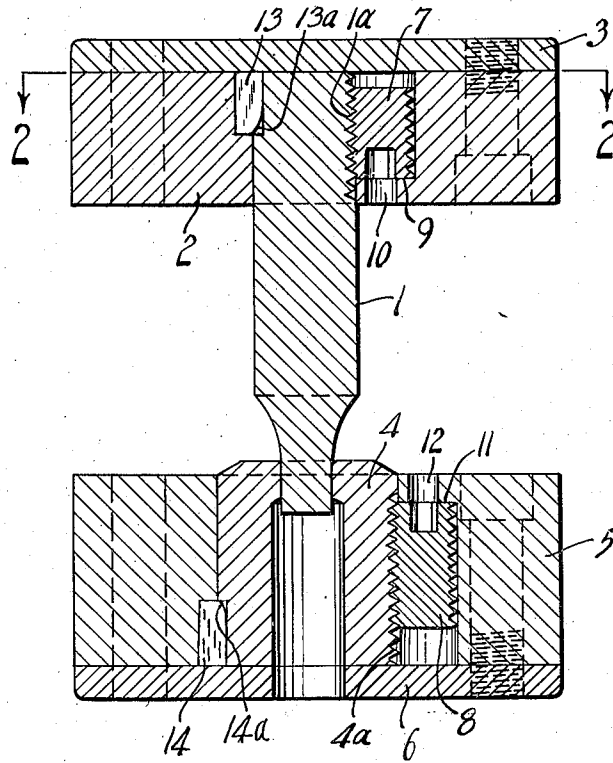


Fig.-1

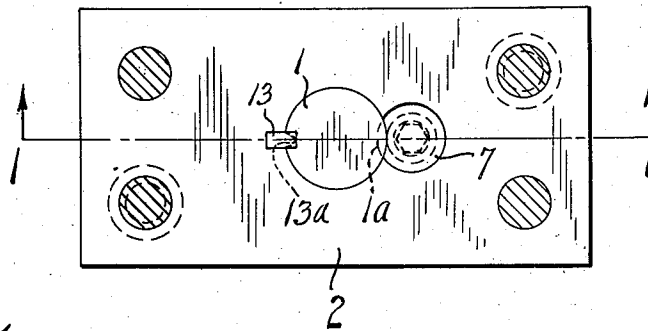


Fig.-2

INVENTOR.
ARTHUR G. GULLBERG
BY
Milburn & Milburn
ATTORNEYS

UNITED STATES PATENT OFFICE

2,393,986

RETAINER DEVICE FOR DEMOUNTABLE
PUNCHES, DIES, AND THE LIKE

Arthur G. Gullberg, Rocky River, Ohio

Application February 26, 1944, Serial No. 524,091

3 Claims. (Cl. 279-76)

This invention relates to an improved form of retainer device for a demountable punch and die or the like.

In this general class of devices it has usually been the practice to remove the die and punch from the rear with the inconvenience of having to remove the hardened plate which affords a backing therefor in each instance and later replacing the same. Then, in order to improve this situation, there has been devised a securing means for the punch and die so that they may be released and removed and replaced without the inconvenience above referred to, as for instance disclosed in the patent to Richard et al., No. 1,621,811, March 22, 1927; and it is upon this type of device that my present invention is an improvement.

The object of the present device is to provide such a retaining means for a punch and die or other such tool, that will not only permit the removal and replacement of the punch and die without having to disassemble any of the other parts, but at the same time will hold the punch and die securely in set position.

Another object is to provide such a device which can be both applied and released in a convenient and dependable manner even after a prolonged period of time.

Another object is to provide such a device with means for preventing accidental turning of the punch or die out of true position.

Another object is to provide such a device that is of comparatively simple and inexpensive construction.

Other objects will appear from the following description and claims when considered together with the accompanying drawing.

Fig. 1 is a vertical sectional view of my improved device shown applied to both a punch and die, this view corresponding to line 1-1 of Fig. 2; and

Fig. 2 is a view taken on line 2-2 of Fig. 1.

It is to be understood that the present form of disclosure is merely for the purpose of illustration and that there might be devised various modifications thereof without departing from the spirit of my invention as herein set forth and claimed.

In the present drawing, I have shown the punch 1 mounted with sliding fit in the retainer block 2, with the plate 3 secured thereto and affording a hardened backing for the rear end of the punch; and also the die 4 mounted with sliding fit in the retainer block 5 with the plate 6 secured thereto so as to afford a hardened backing for the rear end of the die, as will be understood.

Now, instead of having to remove the plates 3 and 6 in order to replace the punch and die at any time, respectively, I have provided an im-

proved screw means 7 for the punch and a like means 8 for the die, whereby they can be removed and other punches and dies inserted without disturbing the plates 3 and 6.

In the case of the punch, this improved retainer screw means 7 is inserted into a plain hole through the top of the block 2 before applying the plate 3. This hole will be of somewhat greater length than the screw member 7 and is provided with a shoulder 9 at the bottom thereof, this hole extending through the bottom side of the block 2 in the form of a restricted opening 10 through which access may be had with a wrench to engage the inside of the lower end of the screw member 7 for turning the same in either direction.

The upper end of the punch shank is provided with an arcuate screw-threaded portion 1a for operative engagement by the screw-threaded member 7; so that, with the screw member 7 in position and upon insertion of the punch 1 sufficiently for its threads to become engaged by those of the member 7, the punch may be raised into fully assembled position by merely turning the member 7 with a wrench from the lower end thereof, the screw member 7 having bearing engagement at its lower end with the shoulder 9 during this manipulation. Either right-hand or left-hand threads may be employed, either in case of screw member 7 or screw member 8.

When the punch 1 has been brought "home," that is with its upper or rear end bearing against the plate 3, such bearing engagement with this plate will afford dependable backing for the punch during the downward operative movement thereof; and, during withdrawing movement of the punch from the work, any danger of accidental dislodgment of the punch will be precluded by the interengagement between the threaded portions of the punch and member 7 and the abutment of the lower end of the member 7 against the shoulder 9.

Then, when it is desired to remove the punch 1, it is merely necessary to turn the member 7 from below in the opposite direction, whereupon the punch will be moved downwardly out of the retainer block 2, the upper end of the screw member 7 having bearing engagement against the plate 3 during this manipulation. Another punch may then be inserted from below in the same manner as above explained and without having to remove the plate 3.

Likewise the screw member 8 is inserted upwardly into a hole in the bottom of the retainer block 5 and will be of somewhat less length than the hole in which it is housed. The screw member 8 has operative engagement with the arcuate screw-threaded portion 4a of the die 4 for insertion or removal thereof by turning the screw

member 8 in one direction or the other, and may be turned by applying to the inside of its upper end a wrench through the restricted opening 12 which is a continuation of the larger hole in which the screw member 8 is housed. The hole for screw 8 is plain, as in case of screw 7.

After first inserting the screw member 8 into its hole in the block 5, the plate 6 is secured in position. Then upon inserting the die 4 into its opening, it may be brought to fully assembled position by turning the screw member 8 while engaging the threaded portion 4a, until the die is brought "home" against the plate 6, the upper end of the screw member 8 having bearing engagement against the shoulder 11 during this manipulation. In order to remove the die 4, the screw member 8 will be turned in the opposite direction by means of the wrench from the upper or forward side of the assembly while the lower end of this screw 8 has bearing engagement with the plate 6; and another die may be inserted from above in the manner above explained.

The key 13 will prevent turning of the punch with respect to the block 2 and this is important when the end of the punch is of a form other than round. This key, which is here shown of rectangular form, may be of any other suitable form; and it is about two-thirds in the block 2 and about one-third in the shank of the punch so as to preclude the danger of its accidental removal when the punch is not in assembly. For instance, the key may have a cylindrical portion located within a correspondingly shaped recess in the block 2 and a substantially rectangular smaller portion along the side thereof for engagement in a recess in the punch shank.

That portion of the key that is intended for engagement by the shank of the punch, is tapered at its lower end, as indicated at 13a, so as to facilitate the entrance of the key into the cut-out portion of the shank of the punch upon insertion of the same into position.

The key 13 will be properly located with respect to the threaded portion 1a so that the key will come into engagement when the threaded portion 1a is engaged by the screw member 7 and thus there will be ensured proper interengagement and relative straight-line movement between the screw 7 and the threaded portion 1a.

The die 4 is provided with a key 14 which is for the same purpose and may be of the same form as the key 13, the key being formed with a tapered portion 14a for facilitating the insertion of the die 4.

In each instance, the key may be located at any point desired, the position indicated in Fig. 2 being only for the sake of convenience in the present illustration.

My present form of device, which involves the same principle in connection with both the punch and the die, comprises a means for simultaneously placing the punch or die in fully assembled position and effecting retaining engagement of the same in such position. Also, the screw-threaded engagement between the punch or die and its screw member affords an extended surface area for such interengagement and hence increases the dependability of such retaining means especially against the danger of the punch or die becoming accidentally removed during the withdrawal movement thereof. The screws 7 and 8 are readily accessible and there is nothing to stick or to get out of order over a prolonged period of time and hence this device possesses a high

degree of dependability. The ready removal of the punch or die from the forward side of the retainer block, without having to remove the rear plate, is of course a decided advantage in either changing or renewing the punch or die. The provision of means for preventing turning of the punch or die out of true position, constitutes another advantage of my present device. Finally, this device comprises comparatively few parts and hence is not costly to manufacture.

Although here disclosed in connection with a punch and a die, yet my present invention is not limited in its use to any particular type of tool but may be employed with different types of punch presses and various other machines in which a tool must be maintained against rotation and also against longitudinal movement with respect to the retaining means within which it is mounted.

What I claim is:

1. In a retainer device for demountable punch, die or like tool, a retainer block having an aperture therethrough that is adapted to receive the shank portion of the tool with a sliding fit, a plate secured to the rear side of said block and affording a hardened backing for the rear end of the tool, the tool shank being formed with an annularly restricted screw-threaded portion within said aperture, said retainer block being provided with a second aperture therethrough adjoining only said screw-threaded portion of the tool shank and substantially parallel to the first-named aperture, and a screw member within said second-named aperture in co-operative direct engagement with the screw-threaded portion of the tool shank for positioning and holding the same in assembly, said second-named aperture being closed at its rear end by said backing plate and being restricted at its forward end so as to provide a shoulder therein for abutting engagement of said screw member and to permit access thereto for rotation of the screw member in either direction for the insertion or removal of the tool at the forward side of said retainer block.

2. In a retainer device for demountable punch, die or like tool, the structure as stated in claim 1, and a key between the shank of the tool and said retainer block for retaining the tool in proper relative arrangement with respect to the retainer block.

3. In a retainer device for a punch, die or like tool that is adapted for demountable engagement in a retainer block, a tool of such character that is provided with a shank portion, said shank portion having throughout its entire extent a plain cylindrical surface that is adapted for sliding engagement in the retainer block therefor, said cylindrical surface having formed directly thereupon an annularly restricted portion of a real screw thread, the entire screw-threaded portion being substantially less than ninety degrees in circumferential extent and being uninterrupted circumferentially throughout its entire extent, said screw-threaded portion being adapted for direct and real screw-threaded engagement by a mating screw-threaded member for effecting such longitudinal sliding engagement of the tool within the retainer block therefor and for retaining the same therein, and said shank portion having provision for preventing dislodgement of the same circumferentially from set position within the retainer block.

ARTHUR G. GULLBERG.