Jan. 27, 1942. H. C. RICKENBACH 2,271,500

DIE HOLDER

Filed July 26, 1939

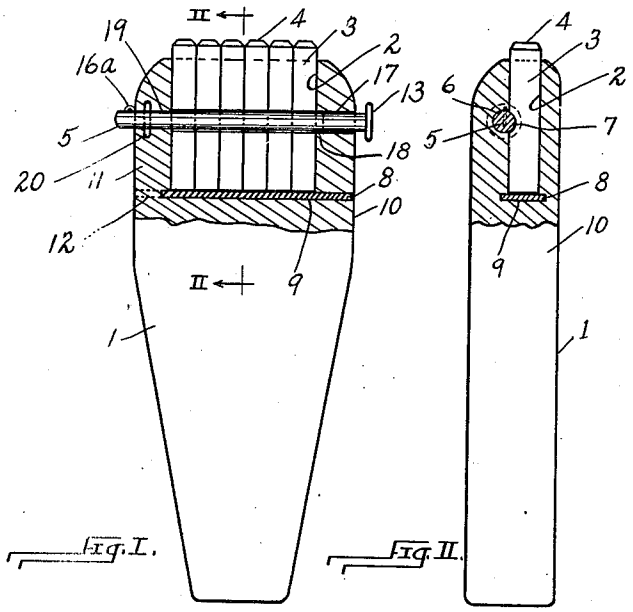


Fig. I.

Fig. II.

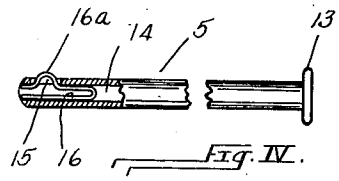


Fig. IV.

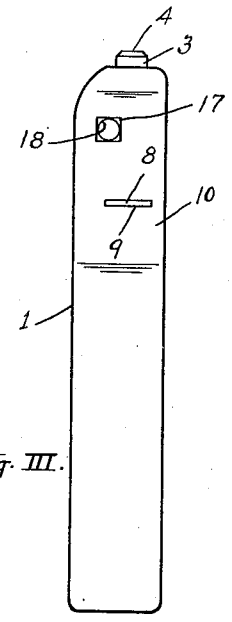


Fig. III.

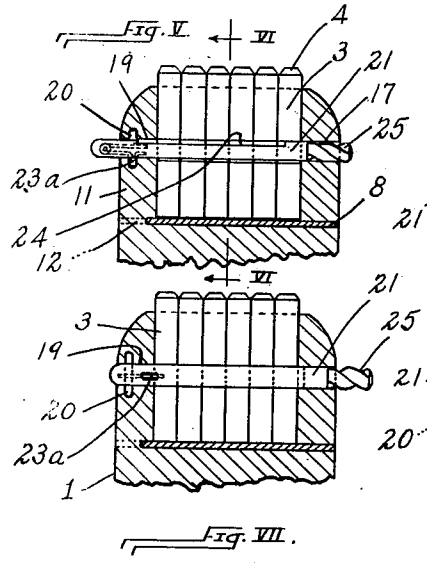


Fig. V.

Fig. VII.

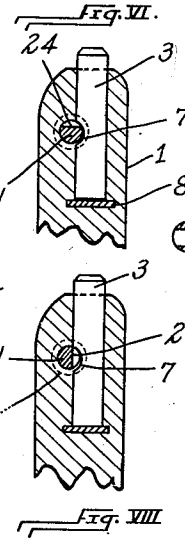


Fig. VI.

Fig. VIII

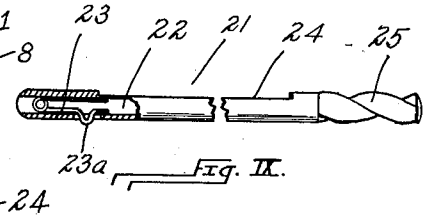


Fig. IX.

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2,271,500

DIE HOLDER

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Application July 26, 1939, Serial No. 286,645

3 Claims. (Cl. 101—28)

This invention relates to a die holder for operatively mounting stamping dies, and which is useful in stamping identifying data upon bodies of steel, or other metal.

The general organization of die holders of this sort consists of a body of substantial weight made of relatively soft and machinable steel. Sunk longitudinally from one end of the body of the die holder there is a socket for holding one or a plurality of the metallic type dies, by which impression is made. In accordance with the most usual practice, the dies are notched on one of their faces, and one wall bounding the die-receiving socket of the die holder is correspondingly grooved. A matching of the notches on the side faces of the dies with the groove in the bounding wall of the die socket provides a bore into which a pin is inserted to lock the dies in the holder.

In accordance with preferred construction, die holders are so made that the bore formed by the matching of notches in the side faces of the dies and the groove in the inner wall of the die holder body is slightly oversize with respect to the cross-sectional dimensions of the locking pin, and the length of the dies inwardly of the groove in the inner wall of the die holder body is such that some vertical play of the dies in the socket of the die holder so that the dies, having play longitudinally of the holder, move inwardly therein and strike the base of the die socket when they come into contact with the body which is to be marked. For this reason the relatively soft steel of which the body of the die holder is made is subjected to the effect of blows struck by the dies at the base of the die socket. In order that the metal at the base of the die socket may not be so worn by repeated blows of the dies as to alter the position of any one or more of the dies in the die holder, it is found desirable to provide a hardened body of metal as a striking surface at the base of the die socket. While such hardened body may be provided by a localized hardening treatment of the metal of the die holder body in this region, it is more desirable to utilize an insert anvil made of a steel, or some suitable alloy, of a harder sort; and to provide against the contingency that such relatively hard metal may be fractured by the impact of the dies, it is desirable that such insert be replaceable. One form of replaceable insert has consisted of a circular plug, having a squared face to lie at the base of the die socket, and insertable in a hole bored through the body of the die holder at the base of the die socket.

In the assembly of the die holder, it is necessary that the locking pin be held against displacement from its locking position. It has been usual to make this engagement by housing, or attaching, a spring in or to the body of the die holder, to exert an engaging force on the locking pin; or to engage the locking pin in its locking position by a latch element, or other mechanical structure carried by the die holder body.

It is the object of my invention to provide, in such an organization, an insert anvil of such form that it does not tend to loosen under the hammer blows struck upon it by the dies in the stamping operation, and of such sort that it requires the use of no fastening means to maintain it in position at the base of the die socket; and it is further an object of my invention to provide a locking pin for engaging the dies in the die socket of the die holder of such sort, and so engaged in the die holder, that it is self-engaging in the body of the die holder, and is either readily removable, or need not be removed, in changing dies.

In the accompanying drawing Fig. I is a view of the die holder showing it partially in front elevation and partially in vertical section, and illustrating one form of locking pin in position to engage the dies in the die-receiving socket of the die holder. Fig. II is a view of the die holder of Fig. I, showing it partially in side elevation and partially in vertical section on the plane of the section line II—II of Fig. I. Fig. III is a view showing the die holder wholly in side elevation. Fig. IV is a detail view of the locking pin shown in Figs. I to III inclusive, taken partially in elevation and partially in longitudinal section. Fig. V is a fragmentary view of the upper portion of the die holder taken in vertical section, and showing a modified form of locking pin in position to lock the dies in the die-receiving socket of the die holder. Fig. VI is a view taken in vertical section on a plane at right angles to the plane of Fig. V, indicated by section line VI—VI of Fig. V. Fig. VII is a view similar to Fig. V and showing the same modified form of locking pin shown in Fig. V, but illustrating the position of the locking pin in the die holder which permits the removal or insertion of dies. Fig. VIII is a vertical sectional view similar to Fig. VI, illustrating the position of the modified form of locking pin shown in Fig. VII. Fig. IX is a detail view partially in elevation and partially in longitudinal section, showing in detail the modified form of locking pin shown in the assembly of Figs. V to VIII inclusive.

In the accompanying drawing reference numeral 1 designates the body of the die holder, which as above noted is desirably made of mild steel, and which has in the head or striking region thereof a die-receiving socket 2 extended longitudinally of the body of the die holder from the end face of the head region. In this die socket there are mounted and detained stamping dies 3, which have their typing faces 4 extended beyond the forward face of the die holder. In Figs. I to IV inclusive a locking pin, designated by reference numeral 5, is extended through the die-receiving socket and the side walls bounding the socket; and has in its die-engaging region a completely circular body lying within a bore formed by the semi-circular groove 6 in the body member of the die holder and the semi-circular notches 7 in a side face of each of the dies 3. As shown, the bore in which the pin 5 lies is slightly oversize with respect to the diameter of the pin in its die-engaging region, so that in stamping, the base or butt ends of the dies may strike anvil 8 lying at the base of the die socket.

Anvil 8 is a thin strip, or plate, of hard steel, or a hard alloy, which is inserted through a slot 9 made through the side wall 10 of the die holder to communicate with the base of the die-receiving socket 2. As is shown particularly in Fig. II, slot 9 is slightly wider than the width of the die-receiving socket, and is extended slightly into the wall 11 of the die-receiving socket which is opposite the one through which it is inserted. This undercutting provides a secure seat for the anvil, and the anvil is desirably made oversize in width, so that it tends to be engaged firmly in position. Through wall 11 in line with the end of anvil 8 there is a small diameter hole 12 through which a small punch may be inserted to drive out the anvil when replacement of the anvil becomes desirable.

This form of striker member, or anvil, presents advantage over those previously in use in that, being a thin member, it tends to be hammered firmly into position rather than to be loosened under repeated blows from the dies as is the case with primarily circular anvils for performing the same function. Also by making the slot 9 and its associated undercutting of a height to accommodate anvils of variant thickness, the anvil may be of a thickness apportioned to the dies, so that dies of slightly different longitudinal dimensions may be satisfactorily accommodated in the die holder.

Locking pin 5 is so made that it may be readily inserted and removed from locking position, and so that in its locking position it is nonetheless adequately engaged in the die-receiving socket 2 of the die holder. To this end it has resilient engagement with the die holder. Such resilient engagement is effected by making a bore 14 extended from the end of the locking pin opposite that which carries the head 13 thereof, at least partially throughout the length of the locking pin. Adjacent the forward end of the locking pin there is a slot 15 communicating with the bore 14 and through this slot there projects the loop 16a of a bent spring member 16 housed in the bore 14. When the locking pin is inserted the loop 16a of the spring member is depressed sufficiently to permit the pin to be pushed wholly through its receiving bore into a position in which slot 15 adjacent the forward end of the pin lies beyond the outer surface of the wall 11. The resiliency of spring 16 thus causes loop 16a to protrude through the slot 15, and to provide a detent effective against accidental displacement of the locking pin longitudinally of the bore in which it lies. A relatively slight force applied axially of the locking pin is, however, sufficient to permit withdrawal of the locking pin for changing the dies in the die-receiving socket.

The die holder body is, as shown throughout the figures of the drawing, adapted alternatively to use with the modified form of locking pin shown in Figs. V to IX inclusive. To this end that portion 18 of the bore for receiving the locking pin which extends through wall 10 of the die-receiving socket has a squared region 17, adjacent the outer face of the wall 10; and that portion 19 of the pin-receiving bore which extends through the wall 11 of the die-receiving socket, has an annular extension or groove 20. The locking pin 21 is at its forward end provided with a bore 22, and a bent spring 23 having a loop 23a projectant through the wall of the bore, similarly to corresponding elements of the locking pin 5. The shank of the pin has, however, a squared face 24 in that region which in assembly lies within the die-receiving socket, and the head 25 of the locking pin is spirally formed.

By making the head 25 of the locking pin, and the bore region 17 in which it lies, of this cooperative form; or by otherwise providing an analogous engagement between the locking pin and this bore region, as by a boss on the locking pin and a spiral thread in that region of the bore, the locking pin has a turning movement accompanying longitudinal movement of the locking pin in the die holder. In Figs. V and VI, the locking position of pin 21 is shown. In that position the pin has been pushed longitudinally of the die-receiving socket to a point at which the loop 23a of the spring member 23 engages in the annular groove 20, so that the squared face 24 of the locking pin lies at an angle to the side faces of the dies. In this position the dies are adequately engaged against displacement from the die-receiving socket.

It is possible to release the dies 3, and to insert other similarly constructed dies in making die changes, without removing the locking pin from the die holder. This is done merely by pressing against the forward end of the pin 21, to move it a slight distance rearwardly. In such movement the loop 23a of spring member 23 is pushed out of groove 20 to have merely a frictional engagement with the wall of the bore portion 19, and the spirally formed head of the pin, in cooperation with the squared bore region 17, turns the locking pin into the position shown in Figs. VII and VIII. In that position the squared face 24 of the locking pin lies parallel to the axes of the dies 3 to permit their withdrawal and the insertion of substituted dies.

A great advantage of my die holder assembly, whichever of the forms of locking pin is used, is in the fact that the user of the die holder may readily keep on hand a supply of such replacement parts as may be from time to time needed. Thus the flat anvil, or striker plate, requiring no added means for securing it in position, it is a simple matter to drive out a worn anvil and to replace it with a new one. In their organization, the small bent spring is the only element of the locking pin as to which there is possibility of failure, and the user of the die holder may, therefore, at negligible expense keep on hand a supply of these springs and may readily insert new springs in replacement.

I claim as my invention:

1. In combination with a die holder having a type-socket in one end thereof and having therein aligned bores providing locking-bar seats extended from the type socket to the outer face of opposite walls bounding the die socket, and grooved type adapted to stand in the said die socket; a locking bar adapted to lie in the said seats provided by the aligned bores in the walls of the die holder and in the grooves of the type to lock the type in the die socket, said bar being removable from the holder, and locking means for the said locking bar composed of a member resiliently mounted in the locking bar for compression to within the peripheral bounds of the locking bar and for resiliently urged extension therebeyond to provide projectant means carried by the locking-bar for engaging the locking-bar in the die-holder in all angular positions of the locking-bar therein, said locking means being contoured to be cammed within the body of the locking bar by the wall of the holder during removal of the locking bar.

2. In combination with a die holder having a type-socket in one end thereof and having therein aligned bores providing locking-bar seats extended from the type socket to the outer face of opposite walls bounding the die socket, and grooved type adapted to stand in the said die socket; a locking bar adapted to lie in the said seats provided by the aligned bores in the walls of the die holder and in the grooves of the type to lock the type in the die socket, the said locking bar being deformed in the region of the grooved type so that in one angular position thereof it releases the type for removal from the die-socket, and a region of the locking bar projectant beyond the outer face of one die-holder wall bounding the die socket cooperatively organized with means in the bounding wall through which it projects to cause axial movement of the locking bar also to cause angular movement thereof into type-locking and type-releasing positions of the locking bar.

3. In combination with a die holder having a type-socket in one end thereof and having therein aligned bores providing locking-bar seats extended from the type socket to the outer face of opposite walls bounding the die socket, and grooved type adapted to stand in the said die socket; a locking bar adapted to lie in the said seats provided by the aligned bores in the walls of the die holder and in the grooves of the type to lock the type in the die socket, the said locking bar being deformed in the region of the grooved type so that in one angular position thereof it releases the type for removal from the die-socket, a region of the locking bar projectant beyond the outer face of one die-holder wall bounding the die socket cooperatively organized with means in the bounding wall through which it projects to cause axial movement of the locking bar also to cause angular movement thereof into type-locking and type-releasing positions of the locking bar, and locking means for the said locking bar composed of a member resiliently mounted in the locking bar for compression to within the peripheral bounds of the locking bar and for resiliently urged extension therebeyond to provide projectant means carried by the locking-bar for engaging the locking-bar in the die-holder in all angular positions of the locking-bar therein.

HARRY C. RICKENBACH.