July 10, 1945. D. V. STELLIN 2,380,343

INTERCHANGEABLE PUNCH AND DIE AND RETAINER FOR SAME

Original Filed March 6, 1944

FIG. 1

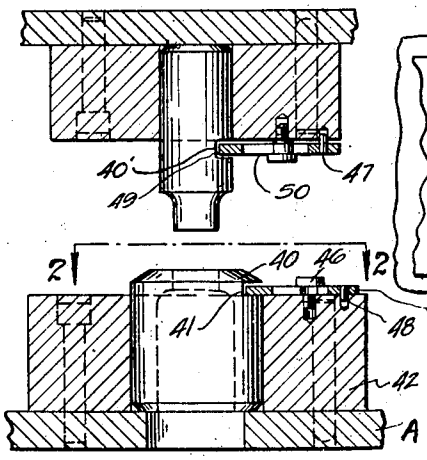


FIG. 2

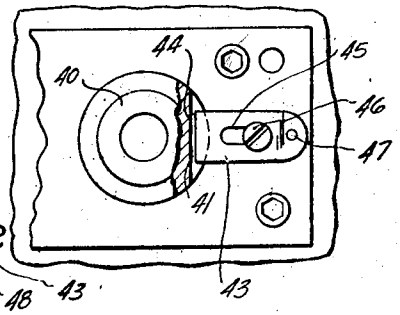


FIG. 3

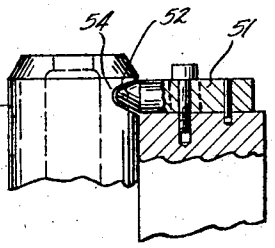


FIG. 4

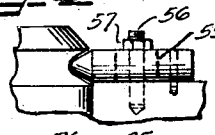


FIG. 5

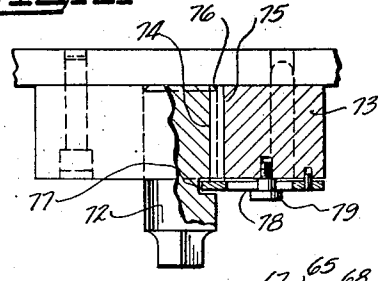
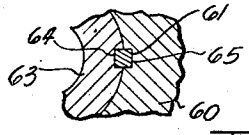


FIG. 6



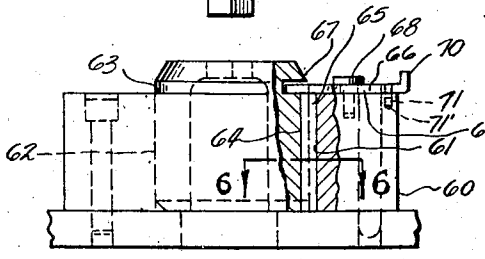


FIG. 7

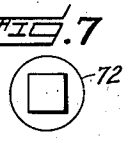
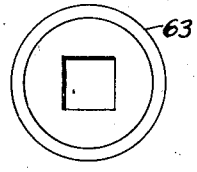


FIG. 8



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UNITED STATES PATENT OFFICE

2,380,343

INTERCHANGEABLE PUNCH AND DIE AND RETAINER FOR SAME

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Original application March 6, 1944, Serial No. 525,233, now Patent No. 2,364,401, dated December 5, 1944. Divided and this application June 28, 1944, Serial No. 542,480

7 Claims. (Cl. 164—118)

The present invention pertains to novel interchangeable punches and dies and particularly to devices for accurately locating and retaining the punches and dies. This application is a division of my co-pending application Serial No. 525,233, filed March 6, 1944, now Patent No. 2,364,401 of December 5, 1944.

The principal object of the invention is to provide such retaining and locating means for punches and dies that are intricate and not necessarily round. Hitherto it has been the practice to interchange round punches and dies requiring no particular accuracy in being located. Obviously the means employed in that connection would not be suitable for non-round or intricate parts.

Another object of the invention is to provide interchangeability of the character described by simple means requiring comparatively little time in making a change. This object of the invention is of great importance in urgent production, as in war work, and in mass production where a given rate of output must be maintained in order to yield a profit. The loss of time incident to changing of punches and dies for any reason, such as breakage or need of sharpening, is substantial. A reduction of this loss by use of the present invention results in an important economy in the over-all operation.

The embodiments disclosed herein include a locking key slidably mounted on the retainer in which the severing member, i. e., the punch or die, is inserted. One end of the locking member is receivable in a notch or groove formed in the severing member. The locking member is held by a screw passed through a slot therein and into the retainer, the slot being of such length as to permit the locking member to be drawn out of the groove or notch when the bolt is loosened. Thus, the severing member can be replaced without dismantling any of the adjoining parts.

When it is desired to hold the severing member against shifting rotatively, as in the case of a non-cylindrical member, it is formed with a lateral notch having a straight bottom. The entering end of the locking member is similarly shaped, to abut the bottom, and the severing member is thus held from turning.

Another disclosed means to prevent the severing member from turning consists of a key received in registering slots formed in the retainer and severing member and running lengthwise of the latter. The exposed end of the key is covered by the slidable locking member which in turn, has an end received in a notch in the severing member. Thus, both the severing member and the key are held by the locking member from dropping, while the key holds the severing member from turning.

Other forms of the invention as seen in the parent case provide the locator or key in various positions in the retainer body. The invention also embodies various forms of keying means as well as several forms of locking devices therefor.

The invention is fully disclosed by way of example in the following description and in the accompanying drawing in which

Figure 1 is a vertical section of one form of the invention;

Figure 2 is a plan view, partly in section, on the line 2—2 of Figure 1;

Figure 3 is an elevation, partly in section, of a modified lock;

Figure 4 is an elevation of another modified lock;

Figure 5 is an elevation, partly in section, of another modification;

Figure 6 is a section on the line 6—6 of Figure 5;

Figure 7 is a bottom plan view of the punch, and

Figure 8 is a plan view of the die.

Reference to these views will now be made by use of like characters which are employed to designate corresponding parts throughout.

Figure 1 shows a conventional punch and die assembly including a plate A and a retainer 42 which need not be described in detail. The die 40 is formed in its wall with notch 41 at the face of the retainer 42. On the retainer is mounted a sliding lock 43 having a square end 44 adapted to enter the notch 41 and abut the bottom thereof. The member 43 has a lengthwise slot 45 adapted to receive a screw 46 which threads into the retainer 42. Where rotational slipping of the severing member is not to be permitted, the square end 44 is brought into abutment with the straight bottom of the notch 41.

The sliding lock 43 is preferably made of suitable steel and carries at its free end a pin 47 adapted to enter a corresponding recess 48 in the face of the retainer 42. This device prevents the sliding lock from sliding on the retainer after it has been set, in the event that the screw 46 becomes loose. In changing the die in the retainer, the complete withdrawal of the lock 43 is permitted by the length of the slot 45 therein.

Similarly, in the punch assembly the punch 40' has a lateral notch 49 receiving the sliding lock 50 which is supported and retained in the manner already described.

As shown in Figure 3, the sliding lock 51 has a rounded entering end 52, and the punch or die 53 has a correspondingly shaped receiving notch 54. In the further modification shown in Figure 4 the sliding lock 55 is held by a stud 56 on which is mounted a tightening nut 57.

More accurate and secure locating of an intricate punch and die is obtained by the construction shown in Figures 5 and 6. The retainer 60 of the die has a vertical key slot 61 communicating with the die recess 62. The die 63 has a longitudinal or vertical slot 64 adapted to register with the slot 61. A key 65 of such size as to fill both slots is inserted in the slot 64 before the die is inserted in its retainer. On insertion of the die, the key also enters the slot 61 and thereby locates the die against rotating.

The locking key is a flat member 66, similar to those previously described, mounted on the retainer 60 and adapted to enter a notch 67 in the die. The key or locator 66 is attached to the retainer by a screw 68 passed through a slot 69 in the locator. The latter has a finger piece 70 and may also have a stop 71 adapted to enter a recess 71' in the top of the retainer.

The punch 72 of the assembly is mounted in its retainer 73 in like manner. It has a longitudinal slot 74 matching with a similar slot 75 in the retainer, both slots receiving a key 76 fitted in the punch before inserting the punch in the retainer. The exposed portion of the punch has a notch 77 receiving one end of a locking key 78 mounted on the retainer by a screw 79 in substantially the manner previously described.

Various forms of locators, locating keys, etc., may be interchanged from one embodiment to another to suit requirements, wherever permitted by the construction involved.

Although specific embodiments of the invention have been illustrated and described, it will be understood that various alterations in the details of construction may be made without departing from the scope of the invention as indicated by the appended claims.

What I claim is:

1. In a punch or die assembly, a retainer, a severing member received in said retainer and having a portion projecting therefrom, said member having a recess in its lateral wall, and a holding member slidably supported by said retainer and having an end adapted to enter said recess, said holding member having a lengthwise slot, and means passing through said slot for fastening said holding member to said retainer, said slot being of such length as to permit said holding member to be drawn fully out of said recess by lengthwise sliding.

2. In a punch or die assembly, a retainer, a severing member received in said retainer and having a portion projecting therefrom, said member having a recess in its lateral wall, and a holding member slidably mounted on said member and adapted to enter said recess, said holding member having a lengthwise slot therethrough, and a screw passing through said slot and into said retainer for tightening said holding member in an adjusted position, said slot being of such length as to permit said holding member to be drawn fully out of said recess by lengthwise sliding.

3. In a punch or die assembly, a retainer, a severing member received in said retainer and having a portion projecting therefrom, said member having a recess in its lateral wall, and a holding member slidably mounted on said member and adapted to enter said recess, said holding member having a lengthwise slot therethrough, and a screw passing through said slot and into said retainer for tightening said holding member in an adjusted position, said slot being of such length as to permit said holding member to be drawn fully out of said recess by lengthwise sliding, said holding member consisting of spring metal and having a projection at one end, said retainer having a recess adapted to receive said projection.

4. In a punch or die assembly, a retainer, a severing member received in said retainer and having a portion projecting therefrom, said member having a lengthwise slot extending from said recess, said retainer having a lengthwise slot adapted to register with the first slot, a key receivable in both slots, and a holding member slidably supported by said retainer and adapted to enter said recess, whereby to traverse and retain said key.

5. In a punch or die assembly, a retainer, a severing member received in said retainer and having a portion projecting therefrom, said member having a lengthwise slot extending from said recess, said retainer having a lengthwise slot adapted to register with the first slot, a key receivable in both slots, and a holding member slidably supported by said retainer having an end adapted to enter said recess, whereby to traverse and retain said key, and releasable means for securing said holding member to said retainer.

6. In a punch or die assembly, a retainer, a severing member received in said retainer and having a portion projecting therefrom, said member having a lengthwise slot extending from said recess, said retainer having a lengthwise slot adapted to register with the first slot, a key receivable in both slots, and a holding member slidably supported by said retainer having an end adapted to enter said recess, whereby to traverse and retain said key, said holding member having a lengthwise slot, and means passing through said slot for fastening said holding member to said retainer, said slot being of such length as to permit said holding member to be drawn fully out of said recess.

7. In a punch or die assembly, a retainer, a severing member received in said retainer and having a portion projecting therefrom, said member having a lengthwise slot extending from said recess, said retainer having a lengthwise slot adapted to register with the first slot, a key receivable in both slots, and a holding member slidably supported by said retainer and having an end adapted to enter said recess, whereby to traverse and retain said key, and releasable means for securing said holding member to said retainer, the entering end of said holding member being shaped to fit linearly against the bottom of said recess, whereby to prevent rotation of said severing member.

DOMNIC V. STELLIN.