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R. C. DANLY

LEADER PIN FOR DIE SETS

Filed May 2, 1924

Fig. 1.

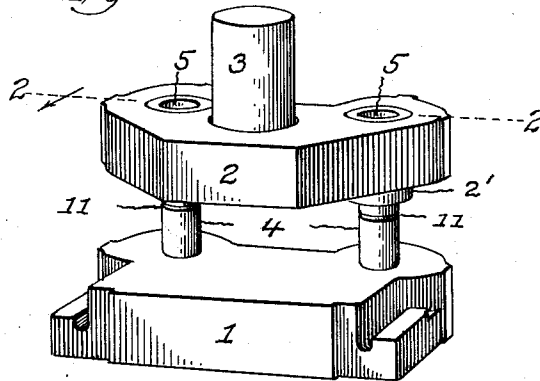


Fig. 2.

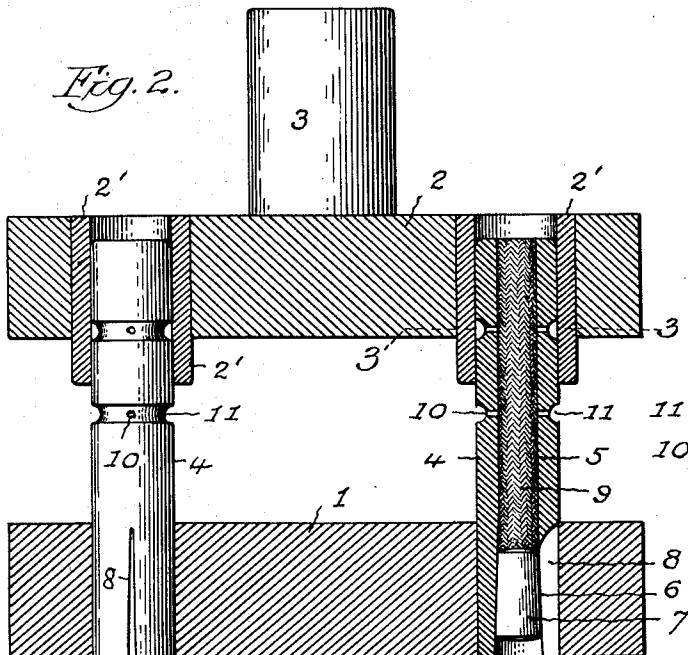


Fig. 3.

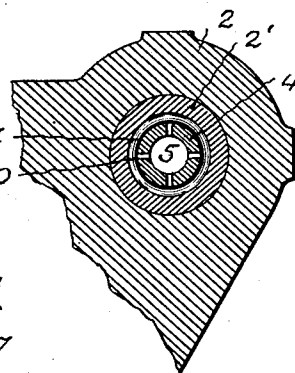


Fig. 4.

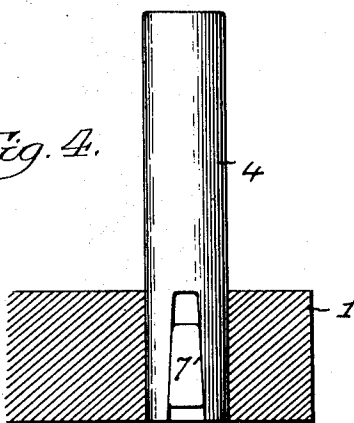
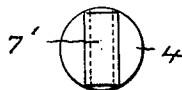


Fig. 5.



Inventor:
ROBERT C. DANLY,
by *Robert C. Danly*
Atty.

UNITED STATES PATENT OFFICE.

ROBERT C. DANLY, OF CHICAGO, ILLINOIS, ASSIGNOR TO DANLY MACHINE SPECIAL-
TIES, INC., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

LEADER PIN FOR DIE SETS.

Application filed May 2, 1924. Serial No. 710,571.

To all whom it may concern:

Be it known that I, ROBERT C. DANLY, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Leader Pins for Die Sets, of which the following is a specification.

This invention relates to means for securing in place the leader pins which form the guiding means between the movable and stationary members of standard die sets of punching and forming presses, and the present improvement has for its objects:

To provide a structural formation and association of parts whereby a leader pin is firmly secured in a member of a die set in a readily removable manner so as to permit of repair, refinishing, etc., of said member, and a subsequent ready and substantial reassembly of the parts.

To provide means whereby an effective lubrication of the surface of the leader pin is attained in a ready and constant manner, all as will hereinafter more fully appear.

In the accompanying drawing:—

Fig. 1, is a perspective view of a standard die set to which the present invention is applied.

Fig. 2, is a sectional elevation on line 2—2, Fig. 1.

Figure 3, is a detail horizontal section on line 3—3, Fig. 2.

Fig. 4, is a detail sectional elevation of a modification.

Fig. 5, is a bottom view of same.

Like reference numerals indicate like parts in the several views.

The standard die set shown in the drawing as illustrative of the present invention, comprises a lower stationary member 1 adapted to be firmly clamped on the bed of a punching or forming press, and a movable member 2 having shank 3 for operative connection with the reciprocating head of the press. The two members 1 and 2, being accurately guided in their relative movement by a plurality of leader pins 4, usually secured in a fixed manner in receiving orifices in the stationary member 1 and having guiding movement in orifices in the movable member 2, and preferably within a hardened bushings 2' fitted in said orifices of the movable member.

In the present improvement the leader pin

4 is formed with a straight cylindrical perimeter from end to end with a diameter equal to that of the receiving orifice therefor in the stationary member 1, say within one-thousand of an inch, and so that the pin will have an accurate fit in said orifice. In the preferred construction shown in Figs. 1, 2 and 3 the leader pin 4 is formed with a centerbore or passage 5 extending from end to end of the pin, with the lower part of said bore or orifice formed with a conical counterbore 6, the taper of which is quite small or minute, ordinarily a one degree taper, for the reception of the hereinafter described expansion plug 7. In connection with the counterbore 6, the lower end of the leader pin is formed with one or more radical slits 8 to permit an expansion of such lower end of the leader pin in the final assembly of the die set parts.

The expander plug or wedge 7 above referred to, is of a very small or minute tapering form corresponding to the tapering end portion 6 of the bore of the leader pin, a taper of one degree being found to afford effective action in the present improvement. The plug or wedge 7 is preferably of a circular form in cross-section, as shown in Fig. 2, the scope of this part of the present invention, however, embraces the formation of the plug or wedge 7' of a rectangular form in cross section as shown in Figs. 4 and 5.

When either type of the plug or wedge is driven into the end of the leader pin, a slight but very powerful expansion is attained of the cylindrical lower portion of the leader pin 4 in the cylindrical receiving orifice of the stationary die set member 2, with a resulting strong and effective connection or "freezing" of the parts together. In attaining a disassembly of the parts an ordinary drive pin is introduced through the central bore 5 of the leader pin to act against the upper end of the plug or wedge 7 and drive the same out of its engagement.

A further and important function of the aforesaid central bore 5 of a leader pin, is to provide a receiving chamber for a wick 9 saturated with a fluid lubricant, which is adapted to flow in a gradual manner through radial orifices 10 into circular grooves 11, in the periphery of the leader pin, and thence to the guiding surface of the same.

Having thus fully described my invention

what I claim and desire to secure by Letters Patent, is:—

1. In a die set for punching and forming presses, the combination of a set member
5 formed with a cylindrical orifice, a leader pin cylindrical throughout to accurately fit said orifice and formed with a central channel and a radial slit at its attaching end, a
10 plug formed with a minute taper fitting the central channel aforesaid, so that when driven into place the plug will expand the attaching end of the leader pin into fixed engagement in said cylindrical orifice, and
15 a companion set member having sliding engagement with said leader pin.

2. In a die set for punching and forming presses, the combination of a set member
20 formed with a cylindrical orifice, a leader pin cylindrical throughout to accurately fit said orifice and formed with a central bore extending the entire length of the pin, one end of said bore being formed with a conical counterbore of a minute taper, said pin end
25 being slitted radially, a conical plug of a complementary tapering form fitting the counterbore of the leader pin and adapted to effect a slight expansion of the same, and a companion set member having sliding engagement with said leader pin.

30 3. In a die set for punching and forming presses the combination of a set member

formed with a cylindrical orifice, a leader pin cylindrical throughout to accurately fit said orifice and formed with a central bore
35 extending the entire length of the pin, one end of said bore being formed with a conical counterbore of a minute taper, said pin end being slitted radially, a conical plug of complementary tapering form fitting the counterbore of the leader pin and adapted
40 to effect a slight expansion of the same, a companion set member having sliding engagement with said leader pin, and a lubricant carrier arranged in the central bore of the leader pin and the leader pin having a
45 peripheral groove and a passage connecting said groove with said bore.

4. A leader pin for die sets of punching and forming presses, comprising a body portion cylindrical throughout formed with a
50 central bore, extending the entire length of the pin, one end of said bore being formed with a conical counterbore of a minute taper, said pin end being slitted radially, and a conical plug of a complementary tapering
55 form fitting the counterbore of the leader pin and adapted to effect a slight expansion of the attaching end of said pin.

Signed at Chicago, Illinois, this 1st day of May, 1924.

ROBERT C. DANLY.