S. DIAMANT.

PUNCH AND DIE SET.

APPLICATION FILED APR. 23, 1921.

1,423,917. Patented July 25, 1922.

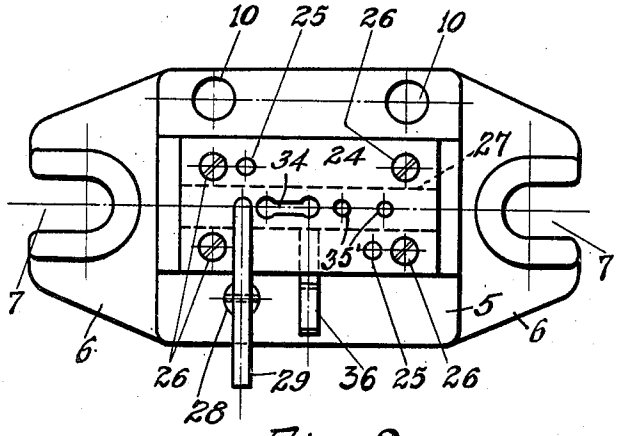


Fig 2

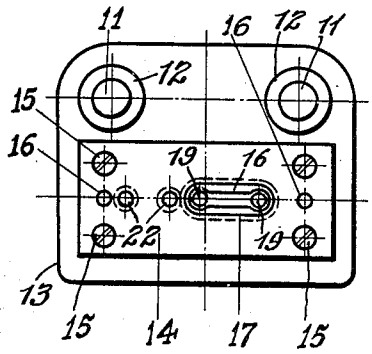


Fig 3

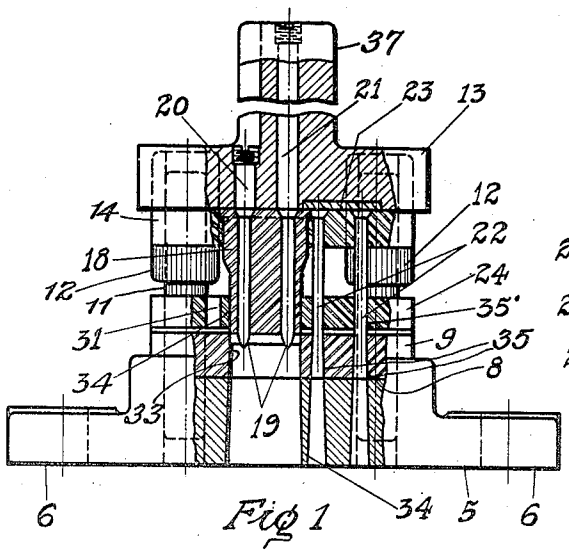


Fig 1

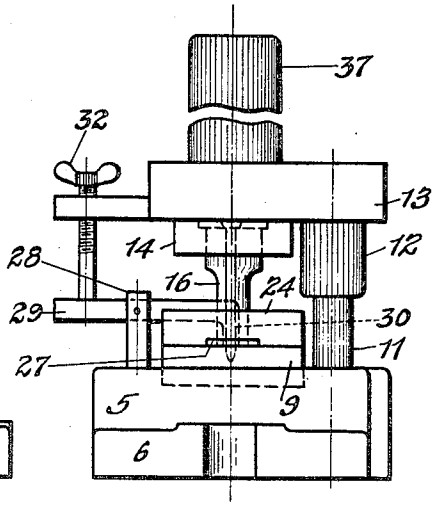


Fig 4

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PUNCH AND DIE SET.

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To all whom it may concern:

Be it known that I, SIDNEY DIAMANT, a citizen of the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Punch and Die Sets, of which the following is a specification.

This invention relates to punch and die sets, and has for its primary object to provide a punch and die set of standardized construction, so that the parts may be interchangeably employed in the building of a die for producing openings or perforations in the piece or part of a required size and shape.

Heretofore, it has been the practice to first design the several parts of each die set required for a particular piece of work. Such designing of each individual die consumes a great amount of time and requires a high degree of skill in the various machining operations necessary in the production of each die part. I, therefore, propose to produce each of the die parts in quantities which may be quickly supplied to the manufacturer and the parts thereof readily assembled and set up in position for use with the ordinary die press.

By means of such standardized construction all machining operations except those which are necessary in order to determine the shape of the piece or part are eliminated, so that the user may construct the completed die in considerably less time than would otherwise be required. Also, these standardized die parts can be compactly arranged and stored when not in use and liability of breakage of the parts is thus reduced to a minimum.

It is another object of the present invention to provide a punch and die set having an improved automatic stop device for positioning the piece or part to be operated upon by the male die member or punch.

With the above and other objects in view, the invention consists in a standardized punch and die set and in the form and construction of the several parts thereof as will be hereinafter more fully described, illustrated in the accompanying drawing, and subsequently incorporated in the subjoined claims.

In the drawing, wherein I have illustrated one preferred and satisfactory embodiment of my invention, and in which similar reference characters designate corresponding parts throughout the several views,

Figure 1 is a side elevation partly in section illustrating the essential parts of the improved standardized punch and die set,

Figure 2 is a top plan view of the die holder having the die blank and stripper plate arranged thereon,

Figure 3 is an inverted plan view of the punch holder and punch, and

Figure 4 is an elevation looking at right angles to Figure 1.

Referring in detail to the drawing, 5 designates the die holder, which, as herein shown, is provided at its opposite sides with laterally extending arms 6, each bifurcated as at 7 to receive a clamp bolt extending through the bolster plate not shown. The body portion of the holder 5 extends above the plane of the arms 6 and is provided in its upper face with a seat 8 to receive the die blank 9. The holder 5 is further provided at one side of the seat 8 with the spaced openings 10 for the purpose of receiving liner pins 11 which are fixed at one of their ends in bushings 12 secured in the punch holder 13. To the bottom face of the punch holder 13 at one side of the bushings 12 the punch plate 14 is securely fixed by means of the screws 15, said punch holder and the plate 14 being further provided with openings to receive dowel pins 16 whereby the plate is accurately positioned on the holder 13. The plate 16 is provided with an opening 17 of the requisite size and shape to receive the punch 18. This punch carries spaced pilots 19 which extend longitudinally therethrough and are in abutting contact with the pilot rods 20 and 21 respectively which are removably arranged in the punch holder 13. In addition to the punch 18, the plate 14, as herein shown is provided at one side of the punch with the spaced perforators 22 having heads at one end countersunk in the face of the plate 14 which is opposed to the holder 13 and bearing against the backing plate 23 which is of a suitable hardened metal and is positioned in a recess in the face of the holder. In addition to the above parts, there is provided a stripper plate 24 adapted for arrangement in superimposed relation to the die blank 9. The plate and die blank are provided with coinciding openings to receive dowel pins 25 and the stripper plate is rigidly secured in

place by means of the screws 26. The face of the stripper plate which is opposed to the die blank has a longitudinally extending recess 27 adapted to receive the piece or part to be operated upon. Upon a standard 28 fixed in the die holder an automatic stop lever 29 is fulcrumed intermediate of its ends and extends transversely over the stripper plate and has an angularly disposed end portion 30 adapted to extend through the opening 31 in the stripper plate and across the recess 27. Thus it will be seen that this angular end of the lever acts as a stop to limit the movement of the piece or part through such recess. The punch holder 13 carries an adjustable screw 32 which is adapted to engage upon the outer end of the lever 29 when the punch is forced downwardly to thereby lift the inner end of the lever out of the path of movement of the work piece, so that it can be shifted through the recess in the stripper plate.

As shown in Figure 1 of the drawings, after the size and shape of the punch have been determined, the die blank 9 and the stripper plate 24 are provided with the openings 33 and 34 respectively to receive the punch. These parts are likewise formed with additional spaced openings 35 to receive the perforators 22 when the latter are employed.

The standardized punch and die set, as it will be manufactured and sold, will consist of all of the parts above described, with the exception of the punch, the pilots carried thereby, the perforators, the stop lever 29, which is in the nature of a special attachment, the pilot rods 20 and 21 and the backing plate 23. All of these parts are stock material and can be readily procured by the individual die user.

In addition to the automatic stop device above referred to, a finger operated stop pin 36 may be provided if desired and may be shifted transversely across the recess of channel 27 to properly position the piece or part.

The bolster plate upon which the die holder is arranged has a series of openings therein so as to enable die holders of different sizes to be rigidly secured thereon. This bolster is mounted upon the face of the press in the usual manner. The ram or presser head engages the punch holder 13 around the upwardly extending standard 37 thereof and as pressure is applied the liner pins 11 move downwardly in the openings 10 of the die holder while the punch and perforators move through the stripper plate 24 and operate upon the piece or part which is held by said plate on the die blank 9.

All of the rudimentary machine work upon the several parts of the die set other than those above referred to has been performed so that after the size and shape of the punch has been designed, the die blank and the stripper plate can be machined in accordance therewith and the die thus very quickly built or set up in condition for use.

These several parts of the punch and die set are interchangeable with parts of other sets and can be employed in various die punching or blanking operations.

The work of the individual manufacturer in the production of suitable dies which heretofore has been very laborious and time-consuming and necessitated the services of skilled mechanics, is greatly decreased and by equipping a plant with my improved standardized die sets, various dies which may be required for different operations are always at hand and the parts of the die can be properly machined and the complete die erected so that the work in hand may be greatly expedited.

From the foregoing description, considered in connection with the accompanying drawing, the construction, manner and use and several advantages of my improved standardized punch and die sets will be clearly understood. The several parts of the punch and die sets are produced in uniform size and large quantities and it is merely necessary to know the size of the die in order to furnish one of the standard punch and die sets to the manufacturer which will perform the desired service. Thus the demands of manufacturers can be very quickly complied with and the completion of orders will accordingly be materially facilitated. It will, of course, be apparent that the standard punch and die sets can be manufactured in various sizes for different kinds of work and as may be required in view of the nature of the material to be operated upon.

While I have herein shown and described one preferred form, construction and relative arrangement of the several parts of the invention, it is nevertheless to be understood that the device is susceptible of considerable modification in the form, proportion and arrangement of the several parts, as defined in the appended claims:

I claim:

1. A punch and die set comprising a die holder, a die blank arranged upon said holder, a stripper plate adapted to be secured upon the die blank in superposed relation thereto, said die holder having spaced openings, a punch holder, liner pins carried by the punch holder and engaged in said spaced openings, a punch plate secured to the punch holder, a punch mounted in the punch plate and adapted to operate through the stripper plate, said stripper plate having a longitudinally extending recess in its bottom face through which the work piece is adapted to be moved, an automatic stop lever pivotally mounted intermediate of its ends and having one end movable through the stripper plate and across said recess to limit the movement of the

work piece in said recess and an adjustable screw carried by the punch holder to engage the other end of the lever and displace the same from its normal position to permit of the adjustment of the work piece in said recess.

2. A punch and die set comprising a die holder, a die blank arranged upon the holder, a stripper plate secured upon the die blank in superposed relation thereto, said die blank and stripper plate being constructed to provide a longitudinally extending groove between them for receiving a work piece, means mounted on the die holder for positioning the work piece in the die, a punch holder, and means carried by the punch holder for rendering said first mentioned means inoperative to enable the work piece to be discharged from the die after it has been operated upon.

3. A punch and die set comprising a die holder, a die blank arranged upon the holder, a stripper plate secured upon the die blank in superposed relation thereto, said die blank and stripper plate being constructed to provide a longitudinally extending groove between them for receiving a work piece, and such stripper plate being formed with an opening in vertical alignment with a solid portion of the die blank, a stop lever provided with a portion arranged to project downwardly through said opening to position a work piece in the die, a punch holder, and means carried by the punch holder for elevating said stop lever away from the die blank to enable the work piece to be discharged from the die.

In testimony that I claim the foregoing as my invention, and I have signed my name hereunder.

SIDNEY DIAMANT.