Aug. 2, 1938. C. E. NEWTON 2,125,803

PERFORATING MACHINE

Filed Jan. 3, 1936 2 Sheets-Sheet 1

Fig. 1.

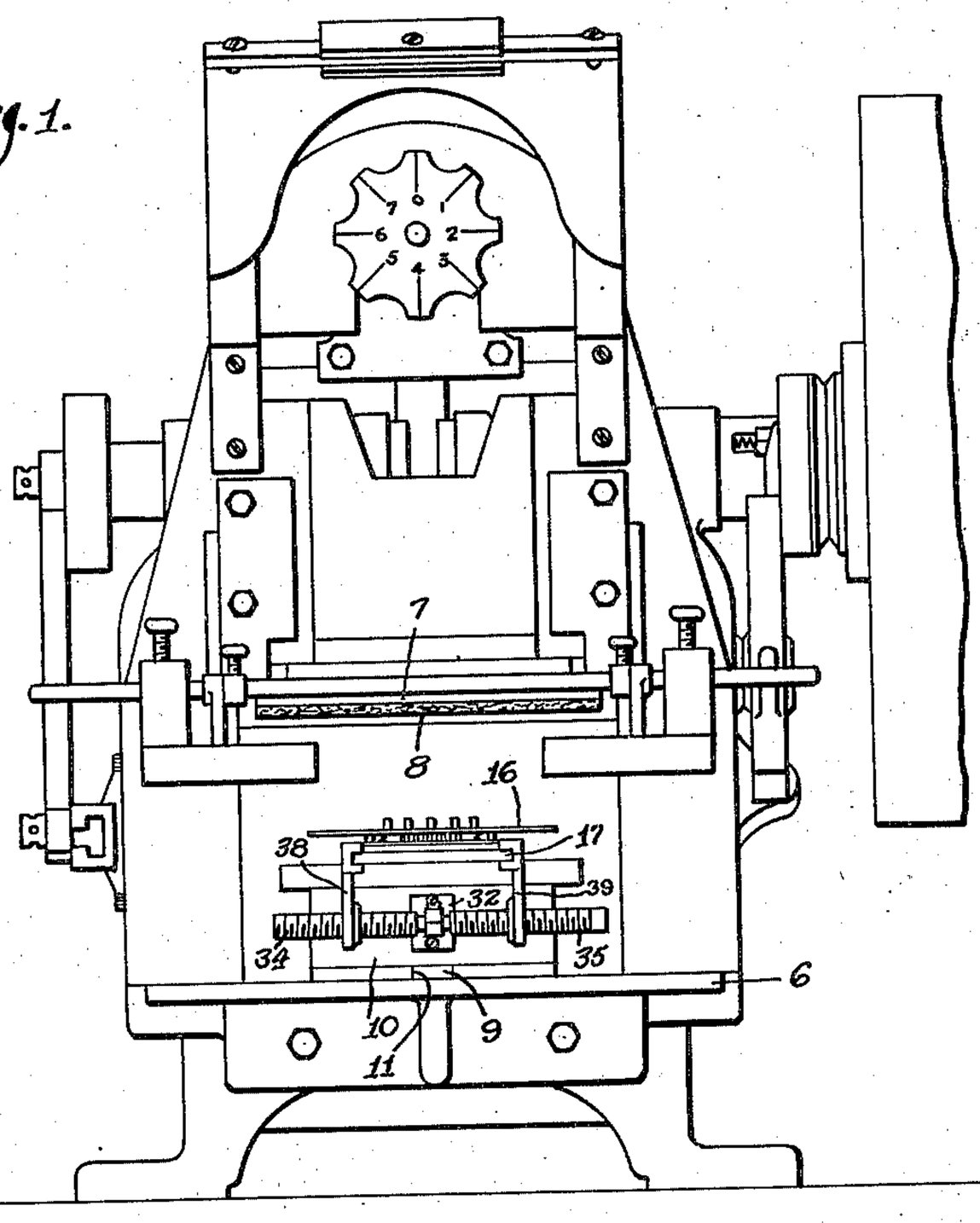
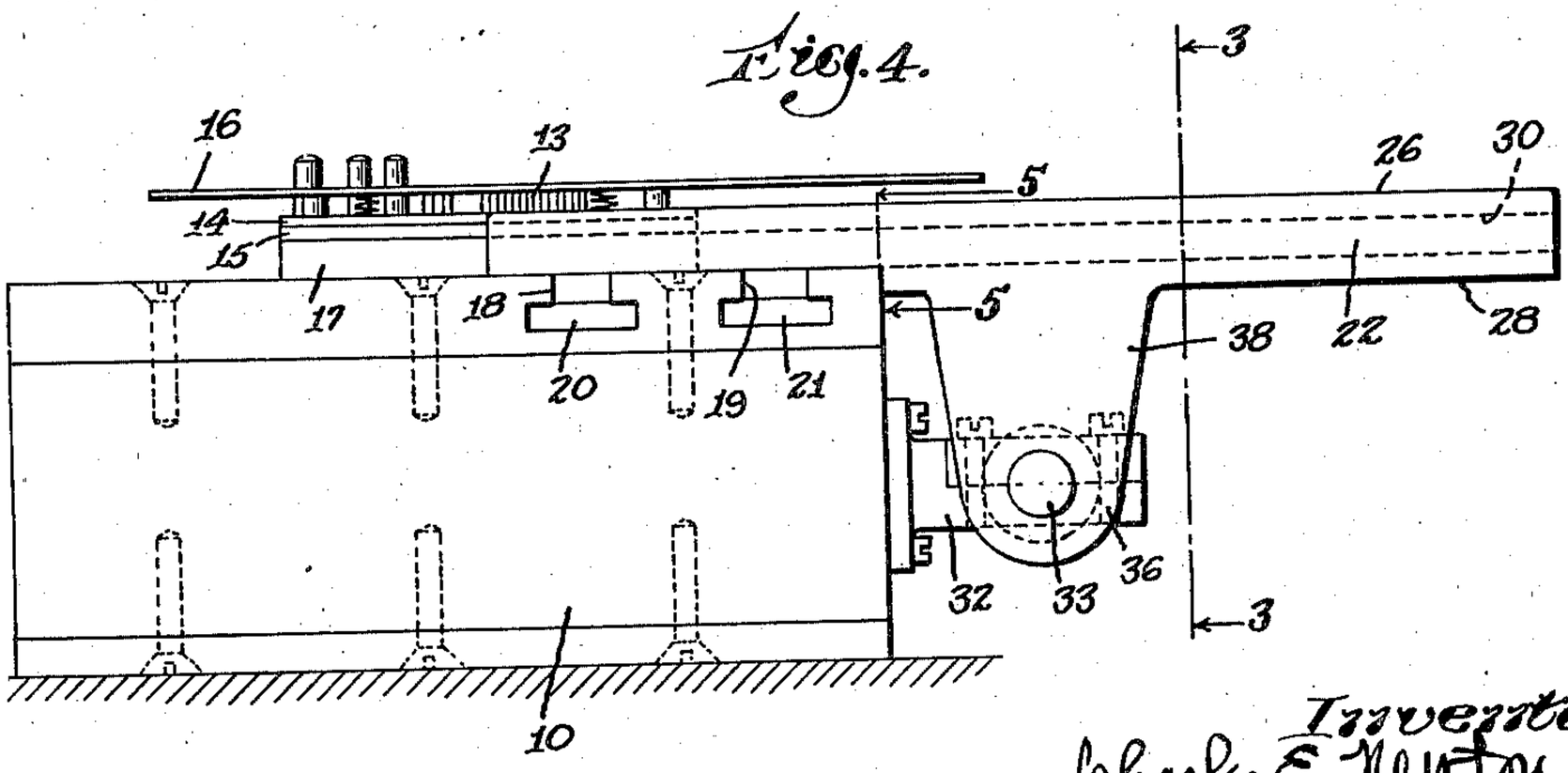


Fig. 4.



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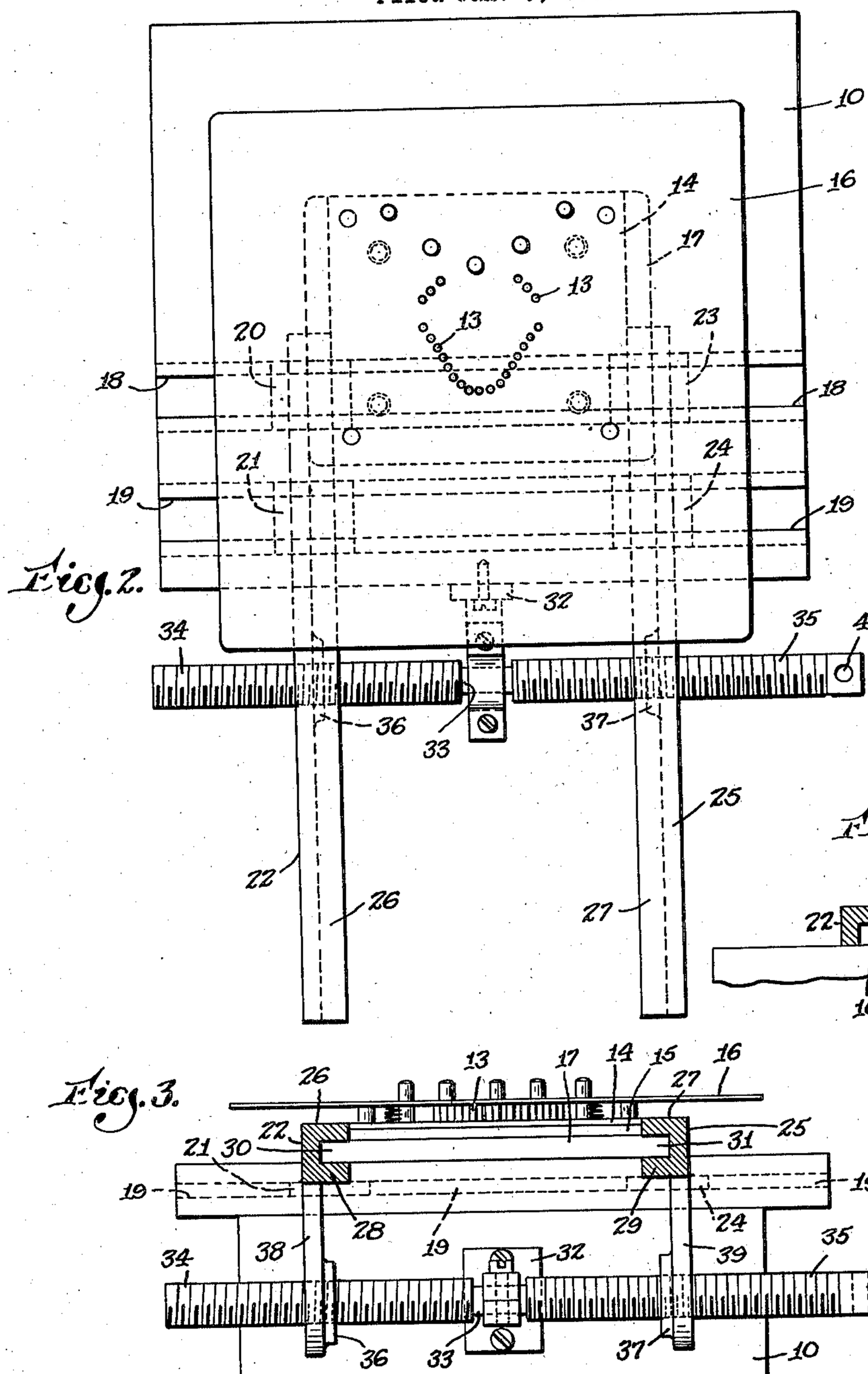

Fig. 2.

Fig. 5.

Fig. 3.

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UNITED STATES PATENT OFFICE

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PERFORATING MACHINE

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Application January 3, 1936, Serial No. 57,393

13 Claims. (Cl. 164—93)

The present invention relates to perforating machines which are used in the manufacture of shoes to form ornamental cutouts and ventilating openings in shoe parts.

Generally, these perforating machines are provided with a bed, a presser member having a work-engaging face mounted for movement toward and away from the bed, and a die structure having upstanding cutting edges interposed between the bed and the presser member to pierce the shoe part placed between the die structure and the presser member. As first constructed, the die structure was mounted to slide, like a drawer, on the bed into and out of position beneath the presser member. Later, in order to operate upon made shoe uppers closed by the back seam, it was considered advisable to support the die structure upon an elevated structure called an anvil, which was mounted to slide, clear of the lateral sides of the machine, into and out of position beneath the presser member. Many perforating machines provided with die supporting structures of the anvil type went into commercial use. For some time past, however, shoe manufacturers have preferred to employ die structures of the original flat bed type in the perforating machines of the anvil type, and in consequence it has been necessary to provide the top of the anvil with a guideway to receive the die structures of the flat bed type and guide them in their horizontal movement from and to a position of clearance to and from a position of pressure, respectively.

This guideway is fixed to the top of the anvil and in consequence it has become the standard practice for the commercial die makers who furnish shoe manufacturers with the die structures to standardize the bases thereof so that they will fit interchangeably the fixed guideway in the perforating machine. In making die structures in which the cutting elements are tubes, for instance, the die structure base supports two plates, one called the top or tube plate and the other the bottom or tube rest plate which is interposed between the top plate and the base. These three parts must all be drilled in accordance with the design to be perforated in the shoe part. The top plate is drilled to receive the tubes. The bottom plate and the base are drilled to allow the punchings within the tubes to pass out of the die structure.

Because of the practice of providing the perforating machine with a fixed die structure guideway, it has become the practice for the die makers to employ a die structure base having a standard width and thickness. The thickness of the standard base must be sufficient to prevent the base from becoming weakened through the drilling therethrough of the greatest number of holes necessary for the most complex design of tubes. But many of the perforation designs required by the shoe manufacturer are simple and in consequence the number of holes required to be drilled through the die structure base is small and the holes may be close together, relatively to the width of the base. Heretofore, the base in a die structure for forming simple perforation designs has been as thick and wide as a base in a die structure for forming the most complex design perforations. Actually, the standard die structure bases approach twenty pounds in weight, thus putting the shoe manufacturer to undue expense and his operatives to a heavy burden in removing the die structures from the machines, in replacing them with other die structures and in otherwise handling them.

The principal object of the present invention is to provide a perforating machine with means for receiving different sizes of die structures, thus to permit the makers thereof to reduce the size of the die structure bases to the size actually required by the particular design to be perforated in the shoe part.

It has been proposed heretofore to reduce the weight of the standard die structure base by the use of some light metal such, for instance, as an aluminum alloy. While these aluminum alloy bases have eased the burden of the operatives, their cost is high and they bounce on the anvil top after each perforating operation.

Accordingly, another object of the present invention is to provide a perforating machine with means for obviating the tendency of light weight die structure bases to bounce after each perforating operation.

To the accomplishment of these objects the various features of the present invention reside in certain devices, constructions and arrangements of parts hereinafter described and then pointed out in detail in the appended claims.

The various features of the present invention will be readily understood from an inspection of the accompanying drawings illustrating the best form of the invention at present known to the inventor, in which,

Figure 1 is a view in front elevation of a perforating machine;

Fig. 2 is a detail view in plan of the die supporting structure;

Fig. 3 is a detail sectional view on the line 3—3, Fig. 4, of the parts illustrated in Fig. 2;

Fig. 4 is a detail view in left side elevation of the parts illustrated in Figs. 2 and 3; and

Fig. 5 is a detail view in sectional elevation on the line 5—5, Fig. 4.

For purposes of disclosure the various features of the present invention are illustrated as being embodied in the perforating machine disclosed in the patent to Knight, No. 1,584,230, May 11, 1926. As shown, (Fig. 1), the machine is provided with a bed 6 and a presser member 7, having a work engaging face 8, which is reciprocated towards and away from the bed 6 by connections from some suitable source of power. As usual, the bed 6 is provided with a guide 9 medially located between opposite lateral edges thereof. Mounted to slide horizontally on the bed 6 is an anvil 10 provided on its bottom with a central groove 11 which receives the guide 9.

The top of the anvil constitutes a supporting surface for a die structure of the flat bed type provided as usual with a plurality of tubes 13 having upstanding cutting edges. The tubes 13 are carried in the usual manner by a top or tube plate 14 and a bottom or tube rest plate 15. Supported from and above the top plate 14 is a yieldingly mounted stripper plate 16. The plates are secured to a base 17.

The die structure is mounted to slide from a position of clearance to a position of pressure in which latter position the die structure is supported upon the upper surface of the anvil 10. To this end the top of the anvil 10 is provided with a pair of inverted T ways 18 and 19 (Figs. 2 and 4) extending across the anvil from one side to the other. These ways receive T blocks 20 and 21, respectively, depending from a vertical plate 22 the bottom edge of which rests upon the left hand upper surface of the anvil 10. The ways 18 and 19 receive also T blocks 23 and 24 (Fig. 2) depending from a vertical plate 25 the bottom edge of which rests upon the right hand upper surface of the anvil 10.

During the position of pressure the vertical plates 22 and 25 embrace the lateral edges of the base 17. The plates 22 and 25 are provided with inturned flanges 26 and 27, respectively, the bottom faces of which engage the lateral margins of the base 17 and the end faces of which flanges engage the lateral edges of the plates 14 and 15. It should be understood that the engagement of the plates 22 and 25 and their flanges 26 and 27 with the block 17 and the plates 14 and 15 is such as to hold the die structure substantially rigid laterally and vertically while permitting the die structure to be slid into and out of its position of pressure upon the upper surface of the anvil 10.

The plates 22 and 25 project forwardly beyond the front face of the anvil 10. From the points of juncture with the front face of the anvil 10 the plates 22 and 25 are provided with inturned ledges 28 and 29, respectively, which in cooperation with the flanges 26 and 27 and the intermediate portion of the plates 22 and 25 form ways 30 and 31 for the base 17 to support and guide the die structure in its movement from the position of pressure into and out of the position of clearance.

In order to vary the distance between the plates 22 and 25 and thus adapt them to guide die bases 17 varying in width, the front face of the anvil carries centrally a bracket 32 in which a horizontal rod 33 is journaled. The rod 33 is provided with left and right screw threaded portions 34 and 35 which engage, respectively, internally threaded hubs 36 and 37, formed in wings 38 and 39 depending, respectively, from the plates 22 and 25. The rod 33 on one end is provided with an opening 40 through which a suitable tool (not shown) may be inserted to facilitate the rotation of the rod 33 in either direction and thus cause the plates 22 and 25 to approach and recede from the median line of the anvil simultaneously and uniformly.

With this construction the die structure base may be reduced to the size actually needed to support the top and bottom plates of the die structure properly for the particular design desired to be perforated in the shoe part. If the design is simple, a small base is ample. As the designs increase in complexity, the size of the base is increased accordingly. By rotating the rod 33 the perforating machine is adapted to receive any size of base required by the industry. By providing the overhanging flanges 26 and 27 the tendency of the light die structure bases to bounce after each perforating operation is obviated.

What is claimed as new, is:

1. In a perforating machine, the combination with an anvil of the type that is supported by the bed of a perforating machine, and a die structure guideway on said anvil comprising movable, spaced guides adapted to slidingly receive and embrace opposite sides, respectively, of the base of any one of a plurality of die structures the base of each of which differs in width from the width of the others, of means for moving the guides simultaneously to vary the space between them appropriately for the width of any one of said die structure bases.

2. In a perforating machine, the combination with an anvil of the type that is supported by the bed of a perforating machine, and a die structure guideway on said anvil comprising movable, spaced guides adapted to slidingly receive and embrace opposite sides, respectively, of the base of any one of a plurality of die structures the base of each of which differs in width from the width of the others, said guides being movable only transversely of the anvil, of means for moving the guides to vary the space between them appropriately for the width of any one of said die structure bases.

3. In a perforating machine, the combination with an anvil of the type that is supported by the bed of a perforating machine, and a plurality of movable, spaced guides adapted to slidingly receive and embrace opposite sides, respectively, of the base of any one of a plurality of die structures the base of each of which differs in width from the width of the others, said guides having bottom portions engaged with the upper surface of the anvil, of means for moving the guides toward or away from one another, while said bottom portions remain engaged with the upper surface of the anvil, to vary the space between the guides appropriately for the width of any one of said die structure bases.

4. In a perforating machine, the combination with an anvil of the type that is supported by the bed of a perforating machine, and a plurality of movable, spaced guides adapted to slidingly receive and embrace opposite sides, respectively, of the base of any one of a plurality of die structures the base of each of which differs in width from the width of the others, said guides having bottom portions engaged with the upper surface of the anvil, of means for moving the guides

simultaneously to vary the space between them appropriately for the width of any one of said die structure bases while said bottom portions remain engaged with the upper surface of the anvil.

5. In a perforating machine, the combination with an anvil of the type that is supported by the bed of a perforating machine, and a guideway, supported by the anvil, for a die structure having a base, said guideway having movable, spaced guides provided with means coactable with said base to prevent the die structure from bouncing after the perforating operation, of means for moving the guides simultaneously, whereby the space between them is varied in such manner with respect to the width of any one of said bases that the bounce-preventing means can coact with the said base.

6. In a perforating machine, the combination with an anvil, of the type that is supported by the bed of a perforating machine, having ways formed on its upper surface, and a guideway comprising movable, spaced guides portions of which are slidable in said ways and other portions of which are adapted to slidingly receive and embrace opposite sides, respectively, of the base of any one of a plurality of die structures the base of each of which differs in width from the width of the others, of means for simultaneously moving said last named portions in accordance with the path determined by the ways to vary the space between said portions appropriately for the width of any one of said die structure bases.

7. In a perforating machine, the combination with an anvil of the type that is supported by the bed of a perforating machine, of means for locating centrally upon the anvil any one of a number of die structures the base of each of which differs in width from the width of the others, said locating means comprising movable, spaced guides adapted to slidingly receive and embrace opposite sides, respectively, of any given one of said bases and means for moving the guides simultaneously to vary the space between them appropriately for the width of said given base to effect therefor the slidable receptability and embracement stated.

8. In a perforating machine, the combination with an anvil of the type that is supported by the bed of a perforating machine, and a guideway, supported by the anvil, for a die structure having a base, said guideway being provided with movable, spaced guide portions adapted to slidingly receive and embrace opposite sides, respectively, of any given one of a plurality of die structure bases, each of said bases differing in width from the width of the others, said guideway also being provided with portions, movable with said first named portions, adapted to overlie the margins of the opposite sides of said given die structure base, of means for moving the guide simultaneously to vary the space between the guideway portions on one side of a base and the guideway portions on the other said base appropriately for the width of any given one of said bases.

9. In a perforating machine, the combination with an anvil, of the type that is supported by the bed of a perforating machine, having ways formed in its upper surface, and a guideway comprising movable, spaced guides supported on said surface for sliding movement thereon and having portions slidable in said ways, of means mounted independently of said portions for sliding said portions in said ways and said guides along said surface.

10. In a perforating machine, the combination with an anvil, of the type that is supported by the bed of a perforating machine, having ways formed in its upper surface, and a guideway comprising movable, spaced guides supported on said surface for sliding movement thereon and having portions slidable in said ways, of means supported from the anvil independently of said portions for sliding said portions in said ways and said guides along said surface.

11. In a perforating machine, the combination with an anvil, of the type that is supported by the bed of a perforating machine, having ways formed in its upper surface, a guideway for a die structure having a base adapted to be supported on said surface, said guideway having portions resting on said surface and adapted to slide therealong into embracement with opposite sides, respectively of the die structure base as it is supported on said surface, said guideway portions having secured thereto slide blocks located in said ways to constrain the sliding of the guideway to the path determined by the ways, and means cooperating with the slide blocks and mounted independently thereof for sliding said guideway portions and blocks as determined by the ways to effect the embracement stated.

12. In a perforating machine, the combination comprising an anvil, of the type that is supported by the bed of a perforating machine, having ways formed in its upper surface, a guideway for a die structure having a base adapted to be supported by said surface, said guideway having portions resting on said surface and adapted to slide therealong into embracement with opposite sides, respectively, of the die structure base as it is supported on said surface, said guideway also having portions adapted to overlie the margins of said base sides, respectively, said first named guideway portions having secured thereto slide blocks located in said ways to constrain the sliding of the guideway portions to the path determined by the ways, and means cooperating with the slide blocks and mounted independently thereof for sliding said guideway portions and blocks as determined by the ways to effect the embracement and overlying stated.

13. In a perforating machine, the combination with an anvil, of the type that is supported by the bed of a perforating machine, having ways formed in its upper surface, and a guideway, for a die structure having a base, supported for sliding movement along said surface and having portions slidable in said ways, said guideway also having portions which overlie said surface to position the die structure thereon by embracing opposite sides, respectively, of said base and portions extending forwardly of the anvil for slidably receiving and supporting the die structure by its base preliminary to its positioning on said surface, of means mounted independently of those guideway portions that are slidable in said ways and cooperating with said portions for sliding the other guideway portions along said anvil surface to effect the positioning or slidable reception and supporting stated.

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