Dec. 12, 1939. N. A. LÓPEZ 2,183,295

DRILL AND WORK HOLDER

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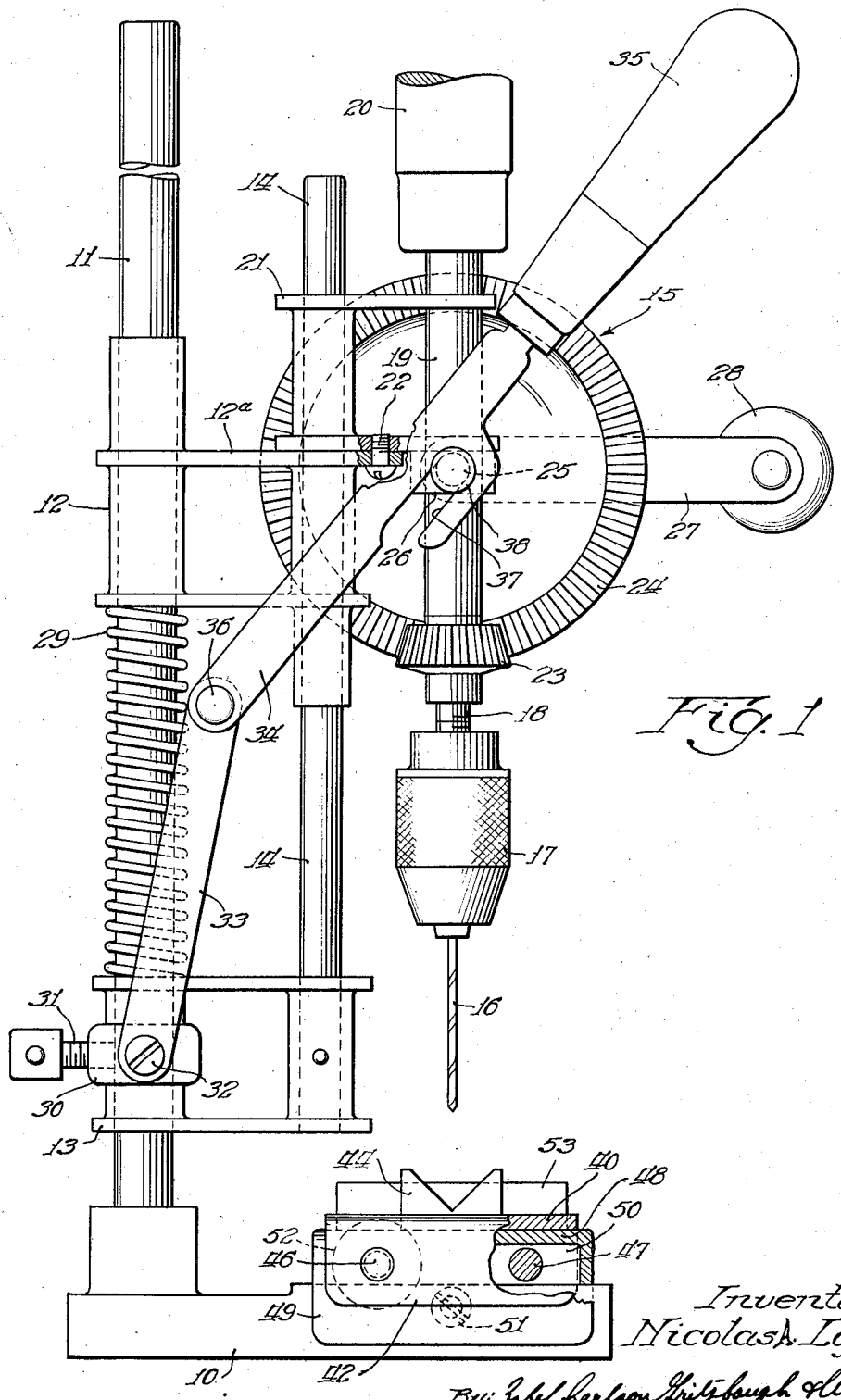


Fig. 1

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Fig. 2

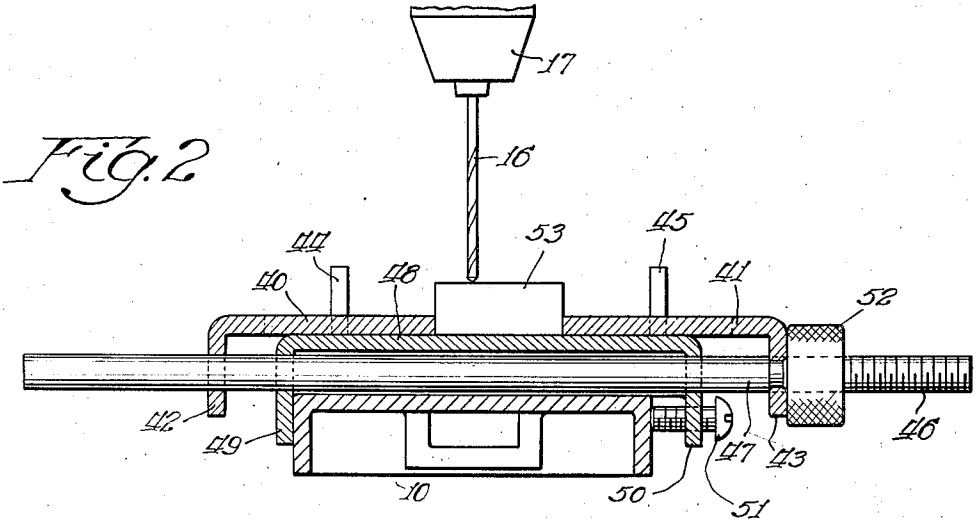
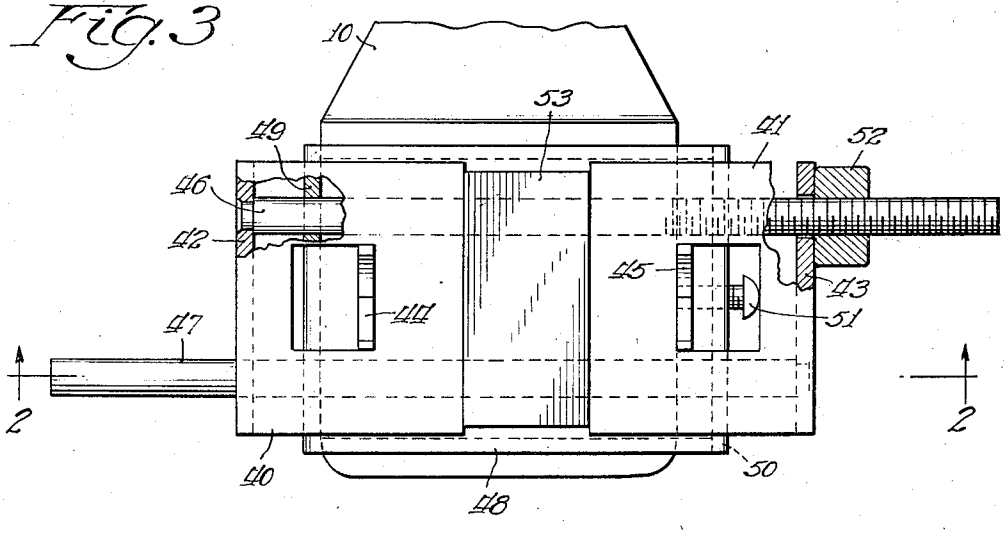


Fig. 3



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Fig. 4

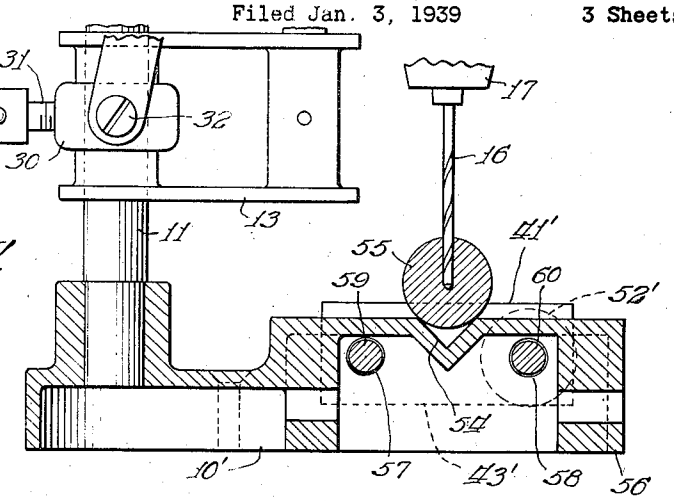


Fig. 5

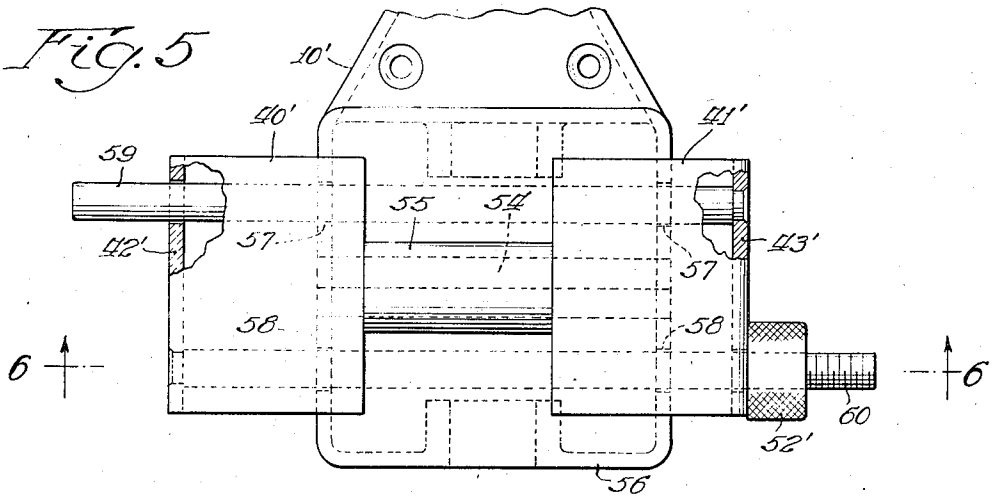
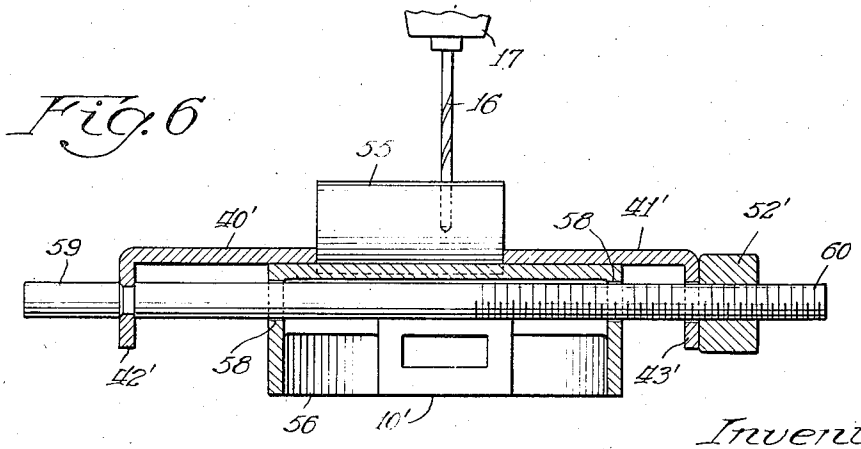


Fig. 6



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UNITED STATES PATENT OFFICE

2,183,295

DRILL AND WORK HOLDER

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6 Claims. (Cl. 77—63)

The present invention relates to drills, and particularly to means whereby a piece of work may be accurately positioned with respect to the drill and held during the drilling operation. It is the purpose of the present invention to provide an improved drill construction having a work holder that is readily adaptable to holding and supporting pieces of different sizes and shapes in position to be drilled.

The present invention contemplates a work holding device consisting of two plate elements which cooperate with the base of the drill stand to position a piece of work on the base, and, wherever desirable, to clamp the work in position so that it will not shift out of place while it is being drilled. The invention further contemplates a device of few parts readily adjustable to adapt it to different sizes and shapes of work.

The features and advantages of the present invention will appear more fully as the description proceeds, reference being had to the accompanying drawings wherein a preferred form of the invention is shown. It is to be understood, however, that the drawings and description are illustrative only, and are not to be taken as limiting the invention except insofar as it is limited by the claims.

In the drawings, Fig. 1 is a view in side elevation of a drill embodying the present invention;

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 3;

Fig. 3 is a plan view of the drill base and work holding attachment;

Fig. 4 is a fragmentary view in side elevation of a portion of the drill stand and base, part of the base being shown in section to illustrate a slightly modified form of work holding attachment;

Fig. 5 is a plan view of the base and attachment shown in Fig. 4, certain parts being broken away for the sake of clearness, and

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 5.

Referring now to the drawings, the present invention is embodied in a drill which, as shown, comprises a base 10 and a standard 11. The standard 11 supports a drill frame 12 for vertical sliding movement. The standard 11 also includes a vertically adjustable bracket 13 that carries an upright guide 14 to aid in guiding the drill frame 12 vertically with respect to the base 10. The frame 12 supports a hand drill 15 which is adapted to be moved vertically to bring the drill bit 16 to the work held on the base 10.

The drill 15 comprises a chuck 17, a drill shaft 18 for mounting the chuck, and a sleeve 19 in which the drill shaft 18 is mounted. The sleeve 19 has a handle 20 at the upper end thereof and is mounted on the frame 12 by means of a secondary frame 21 that fits down over the guide 14 and is connected to the top bar 12a of the frame 12 by a screw 22. By removing the screw 22, the frame 21 can be removed from the guide 14, leaving the drill 15 entirely free of the standard.

The drill 15 includes a pinion 23 on the shaft 18 which meshes with a drive gear 24 that is journalled on a shaft 25 in a block 26 carried by the frame 21. The shaft 25 is adapted to be rotated by a crank arm 27 having a handle 28 at the outer end thereof.

Referring now to the manner of advancing the drill 15 to the work, it will be noted that a spring 29 is interposed between the frame 12 and the bracket 13 upon the standard 11. The bracket 13 has a heavy collar 30 which is threaded to receive a set screw 31 to lock the bracket 13 at any desired level on the standard 11. The collar 30 is, of course, rigid with bracket 13. The collar 30 is provided with a screw stud 32 which acts as a pivot for a link 33. The link 33 is pivoted to an operating lever 34 having a handle 35 at its free end. The pivotal connection is established by means of a headed pin 36. The lever 34 has an elongated slot 37 therein which slot receives a pin 38 mounted on the block 26. The pin 38 is opposite the shaft 25 and is grooved to provide a seat for the lever 34, as will be readily understood.

Normally, the spring 29 will hold the frame 12 which carries the drill 15 in its uppermost position, that is, the limiting position to which the link 33 and the lever 34 will permit the drill 15 to rise. In bringing the drill 15 down to the work, the operator merely presses down on the handle 35, thus forcing the drill 15 and the frame 12 down against the pressure of the spring 29.

In order to position the work properly beneath the drill bit 16, I provide a work holding device which comprises two oppositely disposed plates 40 and 41. The plate 40 has a down-turned flange 42, and the plate 41 has a similar flange 43. The plates 40 and 41 also have sections 44 and 45 struck up from the center portions thereof and notched in their top edges (see the section 44 in Fig. 1) to receive work which may be of round cross section or other shape, that will not lie on a flat surface.

The flange 42 has a rod 46 fixed thereto. This rod extends lengthwise to and through the flange 43 and is threaded at its free end. The flange 43 carries a rod 47 which extends to and through the flange 42. The two rods 46 and 47 serve to mount the plates 40 and 41 upon an inverted channel-shaped member 48 which consists of a flat strip of metal having flanges 49 and 50 at its opposite ends. The flanges 49 and 50 are, of course, apertured for the passage of the rods 46 and 47. The flange 50 is provided with a

set screw 51 by which it is possible to clamp the member 48 on top of the base 10 of the drill. An adjusting nut 52, which may be of any suitable type such as the knurled nut shown, is adapted to be threaded upon the free end of the rod 46 for drawing the plates 40 and 41 together.

In Figs. 2 and 3 the plates 40 and 41 are shown as holding a block 53 that is about to be drilled by the drill bit 16. The block 53 rests upon the member 48 and may be positioned wherever desired on the block 48 by hand, after which the plates 40 and 41 may be brought against the block and tightened against it by turning the screw 52. Once clamped between the plates 40 and 41, the block 53 cannot, of course, move in a direction parallel to the clamping edges of the plates. The plates, however, can be shifted in the direction of the axes of the rods 46 and 47 or, in other words, along a straight line perpendicular to the clamping edges of the plates. The resulting friction between the members 48 and the plates 40 and 41, when a block 53 is clamped, together with the pressure on the block 53, will prevent shifting of the block in the drilling operation. If it is desired to drill a round piece, such as a shaft or a pipe, the round piece is set in the notched sections 44 and 45 and this will prevent its rolling during the drilling operation. There is no particular means provided for preventing endwise shifting of the round pieces.

Referring now to Figs. 4–6, these figures show a modified form of the invention wherein the base 10' is a hollow casting provided with a groove 54 in the top surface thereof, directly below the center of the drill chuck 17. This groove 54 serves as a means for receiving round work, such, for example, as the piece of shaft shown at 55. The base 10' has a peripheral flange 56 which is apertured at the opposite sides of the base, as indicated at 57 and 58, to receive rods 59 and 60. The rods 59 and 60 are secured to plates 40' and 41', similar to plates 40 and 41. That is, the rod 59 is secured to the flange 43' of the plate 41' and passes through the down-turned flange 42' of the plate 40'. The rod 60 is secured to the flange 42' and passes through the flange 43'. The free end of the rod 60 is screw threaded to receive a knurled nut 52'. It will readily be understood that the adjacent clamping edges of the plates 40' and 41' can be brought against a piece of work in the manner illustrated in Figs. 4–6 by positioning the work upon the base 10' and tightening the nut 52'.

It will be noted that the base 10' has two depending thick lug portions, one at the edge most remote from the standard 11 and the other adjacent to the rod 59. These lugs give the necessary strength to the base at the point where the greatest pressure occurs, which is directly beneath the drill line. In addition, these lugs are apertured, as shown, so as to receive a clamping device to aid in attaching the base wherever desired.

From the foregoing description it is believed that the construction and advantages of the present invention will be readily apparent to those skilled in this art. Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a hand drill, a work-holding device, said device comprising in combination a drill stand base, two plates adapted to clamp work between their adjacent edges, said plates having depending flanges at their outer edges, a rod fixed to a flange of each plate and extending through the corresponding flange of the other plate, said base having means slidably receiving and guiding said rods, and means on one of said rods for holding the plates against work inserted between them.

2. In a hand drill, a work-holding device, said device comprising in combination a drill stand base, two plates adapted to clamp work between their adjacent edges, said plates having depending flanges at their outer edges, a rod fixed to a flange of each plate and extending through the corresponding flange of the other plate, said base having means slidably receiving and guiding said rods, and means on one of said rods for holding the plates against work inserted between them, said work-holding device comprising, also, notched supporting means for holding round work with its axis parallel to said plates.

3. In a hand drill, a work-holding device, said device comprising in combination a drill stand base, two plates adapted to clamp work between their adjacent edges, said plates having depending flanges at their outer edges, a rod fixed to a flange of each plate and extending through the corresponding flange of the other plate, said base having means slidably receiving and guiding said rods, and means on one of said rods for holding the plates against work inserted between them, said work-holding device comprising, also, notched supporting means for holding round work with its axis parallel to said plates, said notched supporting means being in said base below the plates.

4. In a hand drill, a work-holding device, said device comprising in combination a drill stand base, two plates adapted to clamp work between their adjacent edges, said plates having depending flanges at their outer edges, a rod fixed to a flange of each plate and extending through the corresponding flange of the other plate, said base having means slidably receiving and guiding said rods, and means on one of said rods for holding the plates against work inserted between them, said work-holding device comprising, also, notched supporting means for holding round work with its axis parallel to said plates, said notched supporting means being on said plates.

5. In a hand drill, a work-holding device, said device comprising in combination a drill stand base, two plates adapted to clamp work between their adjacent edges, said plates having depending flanges at their outer edges, a rod fixed to a flange of each plate and extending through the corresponding flange of the other plate, said base having means slidably receiving and guiding said rods, and means on one of said rods for holding the plates against work inserted between them, said first named means comprising a member apertured to receive said rods and removably mounted on said base.

6. A work-holding attachment for drills comprising a member having means to secure it to a drill, two plates overlying said member and having depending portions at their outer edges, a rod secured to one plate and extending through said member and the depending portion of the other plate, a second rod secured to said other plate and extending substantially parallel to the first named rod through said member and through the depending portion of said first named plate, and means on one rod for drawing said plates together.

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