

May 30, 1939.

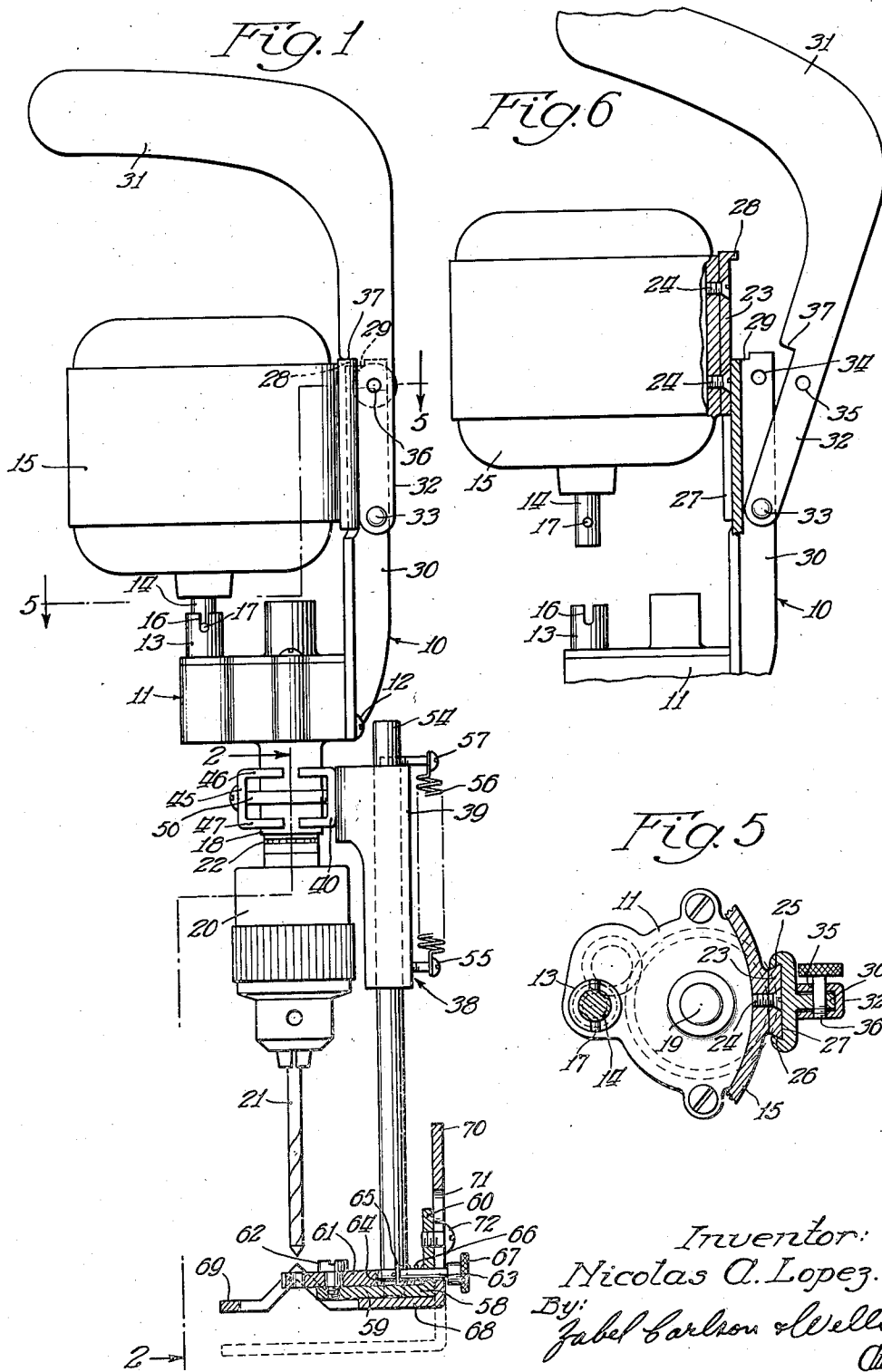
N. A. LOPEZ

2,160,274

PORTABLE POWER DRIVEN TOOL

Filed Oct. 8, 1936

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Fig. 2

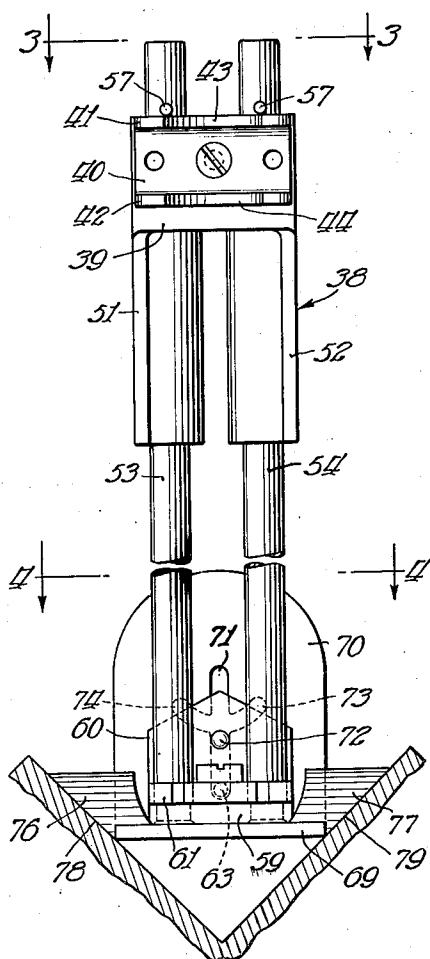


Fig. 3

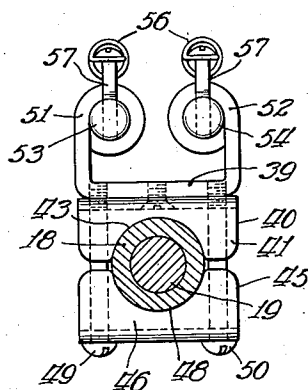


Fig. 4

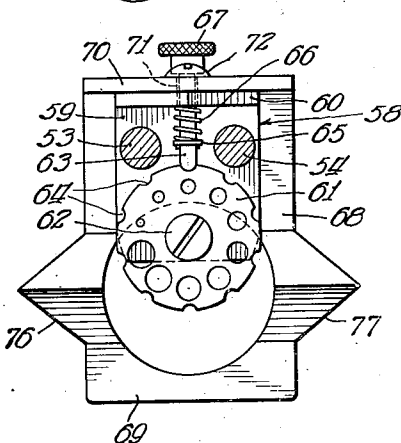
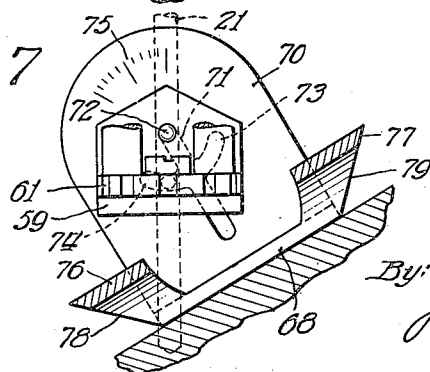


Fig. 7



Inventor:
Nicolas A. Lopez.

By: *Jacob Carlson & Wells*
Attys.

UNITED STATES PATENT OFFICE

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PORTABLE POWER DRIVEN TOOL

Nicolás A. Lopez, Chicago, Ill.

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5 Claims. (Cl. 77—6)

This invention relates to portable power driven tools such as drills, saws, grinders, polishers, and the like.

It is the principal purpose of this invention to provide a tool supporting frame, such for example as a drill frame, having thereon a power translating mechanism and means for attaching a tool thereto, which frame has means for radially mounting and removing a motor to drive the tool.

In the use of portable tools of the character above referred to, it is not economical to employ a separate complete tool for each purpose because of the expense involved in providing motors and gears and power translating units for each tool such as a saw or a grinder or a drill.

In the present invention, I have provided a frame which is readily adapted to support a power translating mechanism, a tool chuck, a tool guide, and a work engaging member as a general assembly, the frame being provided with means whereby a motor can be quickly attached to or detached from the frame. The tool guide and the work engaging member are removably mounted upon the frame which desirably is made up of a power translating unit and tool attaching chuck as one part with a handle and motor mounting section as another part.

The invention further contemplates certain novel improvements in the tool guide and work engaging mechanism which are particularly adapted to facilitate the application of such tools as drills to work of different shapes.

The features and advantages of the invention will become more apparent from the following description, 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 in so far as it is limited by the claims.

In the drawings—

Fig. 1 is a side view partly in section of a portable tool embodying the invention;

Fig. 2 is a side view taken substantially on the line 2—2 of Fig. 1 showing the tool guide and work engaging member removed from the framework;

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

Fig. 4 is a sectional view on the line 4—4 of Fig. 2;

Fig. 5 is a sectional view on the line 5—5 of Fig. 1;

Fig. 6 is a fragmentary side view partly in

section showing the parts in the upper portion of Fig. 1 in a changed position.

Fig. 7 is a side view showing the work engaging member turned at an angle to the axis of the drill.

Referring now in detail to the drawings, the invention is shown as applied to a portable drill structure although it is obvious that it is not limited to drills as many other types of tools may be just as readily used.

The device embodies a back frame member 10 which carries a power translating mechanism 11 secured on the back frame member 10 by means of screws 12. This power translating mechanism may comprise a speed reducing gear or other suitable mechanism such as the mechanism for changing the rotary motion of a motor to a reciprocating motion for saws or files and the like. The power translating unit 11 has a connecting shaft 13 provided with a socket to receive a shaft 14 of a motor 15, the connecting shaft 13 being provided with slots 16 to receive a pin 17 to establish a driving connection from the motor 15 to the power translating device 11. In the form of the invention shown, the power translating device 11 has a sleeve 18 through which a shaft 19 (see Fig. 3) projects to a chuck 20 that is adapted to grip a work tool such as the drill 21. A suitable thrust bearing 22 may be interposed between the chuck 20 and the sleeve 18.

The motor 15 is readily detachable from the other mechanism. It is provided with a plate 23 secured by screws 24 to the motor housing. This plate has its side edges undercut as indicated at 25 and 26 and is slidable longitudinally in a groove 27 provided in the back frame member 10. The plate 23 has a lip 28 at the rear end thereof which lip is adapted to seat against a shoulder 29 on the end of the back frame member 10 when the motor is pressed into driving position as shown in Fig. 1. The back frame member 10 has a longitudinally running rib 30 thereon. An L-shaped handle piece 31 has a portion 32 which is U-shaped in cross section adapted to embrace the rib 30. The portion 32 is pivoted to the rib 30 by means of a pin 33. The rib 30 has an aperture 34, and the portion 32 of the handle 31 is apertured as indicated at 35 so that, when the portion 32 is pressed down on the rib 30 in the position shown in Fig. 1 and Fig. 5, a lock pin 36 can be passed through the apertures 34 and 35 to lock the handle 31 in the position shown in Fig. 1. In this position, a shoulder 37 on the handle extends down behind the lip 28 on the plate 23 and across the groove

27 thereby locking the motor 15 firmly in operating position.

A tool guide and work supporting mechanism indicated generally by the numeral 38 is secured upon the sleeve 18. A block 39 carries a channel bar 40 which has its flanges 41 and 42 cut out as indicated at 43 and 44 (see Fig. 2) to receive the sleeve 18. A second channel bar 45 has its flanges 46 and 47 also cut out as indicated at 48 to receive the sleeve 18. The two bars 40 and 45 are clamped upon the sleeve 18 by screws 49 and 50. The block 39, as shown, comprises a metal plate which is bent at the sides to provide a pair of spaced guides 51 and 52 adapted to slidably receive rods 53 and 54. The guides 51 and 52 are formed by bending the block 39 into substantially circular form at its opposite side edges. Near their lower edges, the portions 51 and 52 are provided with screws 55 to which springs 56 are secured, the upper ends of the springs 56 being secured to screws 57 in the rods 53 and 54. The springs 56 are under tension tending to pull the rods 53 and 54 downwardly as indicated in Fig. 1.

The rods 53 and 54 carry a plate 58 at their lower ends. This plate has a flat portion 59 extending toward the axis of the drill 21 and an upstanding rear portion 60 extending parallel to the axis of the drill 21. A drill guide 61 is rotatably mounted on the top of the portion 29 by means of a pivot pin 62. A spring pressed pin 63 extends through the upstanding portion 60 of the plate 58 and engages notches 64 in the drill guide plate 61 to hold the drill guide in any adjusted position. The pin 63 has a collar 65 thereon. A coiled spring 66 is interposed between the collar 65 and the portion 60 of the plate 58. A knurled handle 67 is provided on the pin 63 in order that it may be drawn away from the notches 64 in the drill guide 61. A work engaging member 68 is secured to the plate 58. The work engaging member has a horizontally extending portion 69 and a mounting portion 70 extending up parallel to the portion 69 and guided thereby. The mounting portion 70 has a vertically running slot 71. A screw 72 passes through the slot 71 and is threaded into the portion 60 to secure the work engaging member in position against the plate 58. It will be noted that the slot 71 also extends down vertically around the pin 63 so that the pin 63 and the screw 72 together normally form a guide which prevents angular movement of the member 68 about the screw 72 as a pivot.

The member 68 can be raised and lowered, however, by sliding the screw 72 and the pin 63 vertically in the slot 71. The slot 71 has a pair of curved portions 73 and 74 (see Fig. 2 and Fig. 7) which permit the member 68 to be turned at an angle to the axis of the drill about the screw 72 as a pivot when the member 68 is lowered to its lowered position. The slots 73 and 74 provide passages to receive the pin 63 in this position of the member 68.

For purposes of accurately setting the angle at which the member 68 is turned, a suitable scale of angles may be provided at 75 on the upstanding portion 70 of the member 68. The horizontal portion 69 of the member 68 is bent upwardly to provide V-shaped portions 76 and 77, the upper extremities of which are on a line intersecting the axis of the drill 21 and running parallel to the upstanding portion 70 of the member 68. Between the portions 76 and 77, the member 68 is cut away to provide an opening large enough to permit the tool guide 61 to extend down between

these portions. This is clearly indicated in Fig. 1. A shaft or angularly shaped piece of work can thus be positioned in the V-shaped portions 76 and 77 and held solidly during the drilling operation. The outer edges of the portions 76 and 77 are bevelled as indicated at 78 and 79 on an angle of 45 degrees to the horizontal so that the member 68 can be fitted into a corner as illustrated in Fig. 2 to accurately position the drill for drilling holes in a corner.

Thus the single work engaging member 68 can be used for a great variety of work making it unnecessary to change from one work engaging member to another. The tool guide 61 cooperates with the work engaging member to accurately position the drill close to the work and thus avoid breakage of drills which might otherwise occur.

In the event that it is desired to use the portable tool frame consisting of the back frame member 10 and the handle 31 for a different type of work, the power translating device 11 can be replaced with a different type such as a higher speed or lower speed with little or no difficulty. The motor 15, of course, can be very readily transferred from one frame to another making it unnecessary to have more than one motor for several tools.

From the above description, it is believed that the construction and operation of this device will be readily apparent to those skilled in this art.

Having thus described one specific form of my invention, what I claim as new and desire to secure by Letters Patent is:

1. A tool supporting frame of the character described comprising a back frame member, means on said back frame member adapted to removably mount a motor, a power translating mechanism secured to said back frame member having a shaft provided with means to couple it with a motor shaft, a handle member movably connected to said back frame member, said handle member having means adapted in one position of the handle member to cooperate with the back frame member in securing a motor thereto, and means for locking said handle member in said last named position, said power translating mechanism having a tool receiving chuck thereon, and a tool guide frame fixed to said power translating mechanism and having guide means for the tool spaced from said chuck.

2. A tool supporting frame of the character described comprising a back frame member, means on said back frame member adapted to removably mount a motor, a power translating mechanism secured to said back frame member having a shaft provided with means to couple it with a motor shaft, a handle member movably connected to said back frame member, said handle member having means adapted in one position of the handle member to cooperate with the back frame member in securing a motor thereto, and means for locking said handle member in said last named position, said power translating mechanism having a tool receiving chuck thereon, and a tool guide frame fixed to said power translating mechanism and having guide means for the tool spaced from said chuck, said tool guiding frame having a work engaging member adjustably mounted thereon.

3. A portable tool supporting frame of the character described comprising a back frame member, a tool holding chuck supported from said back frame member, connecting mechanism carried by said back plate for connecting a motor shaft in driving relation to said chuck, said back

frame member having means to mount a motor thereon, and a handle member carried by the back frame member and having means to lock the motor in operative position on the back frame member, a tool guide frame carried by said back frame member, a work engaging member carried by said last named frame, and a tool guide member carried by said last named frame, said work engaging member being adjustable toward and away from the tool guide.

4. In a portable tool supporting frame of the character described, a tool guiding and work engaging frame comprising a mounting block having means to secure it to the tool supporting frame, said block having means to slidably mount a pair of rods thereon, a pair of rods slidably mounted on said block, a tool guide fixed to said rods, said tool guide comprising a plate to which the ends of said rods are fixed, a rotatable tool guide pivoted on said plate, said plate having a turned-up portion extending parallel to said rods, said tool guide having peripheral notches, and a

spring pressed lock pin extending through said turned-up portion to engage said notches.

5. In a portable tool supporting frame of the character described, a tool guiding and work-engaging frame comprising a member having opposed clamping means adapted to receive a portion of the tool supporting frame therebetween, a rod slidably mounted in said member for movement toward and away from the tool supporting frame, a mounting plate fixed to said rod, a tool guide adjustably mounted on said plate on the side thereof toward the tool supporting frame, and a work-engaging member secured to said plate on the opposite side from the tool guide, said work-engaging member including a pair of V-shaped sections separated by an opening adapted to receive the tool guide, said V-shaped sections having their outside edges bevelled at an angle of 45° to the face of the work-engaging member.

NICOLÁS A. LOPEZ.