Sept. 10, 1957 L. E. MEDAL 2,805,691

POWER TOOL

Filed Oct. 18, 1954 2 Sheets-Sheet 1

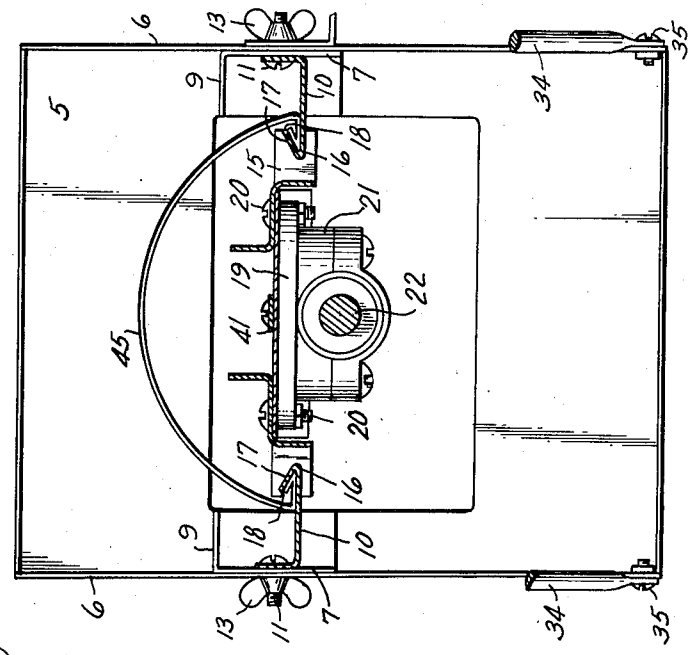


Fig. 4

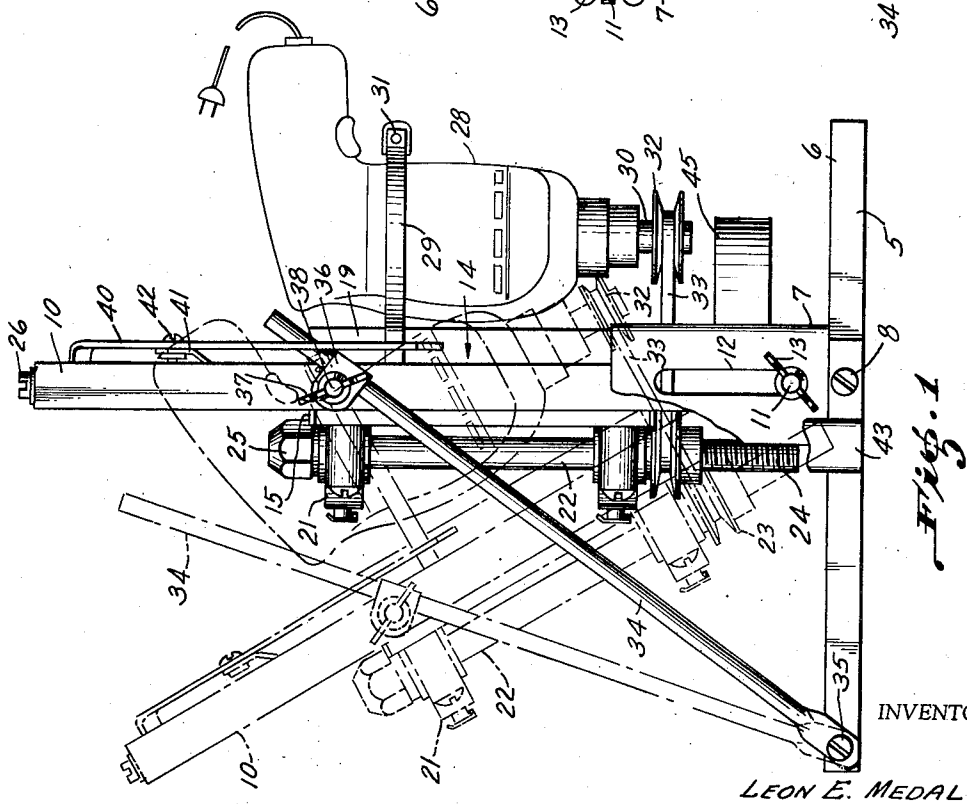


Fig. 1

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Fig. 2

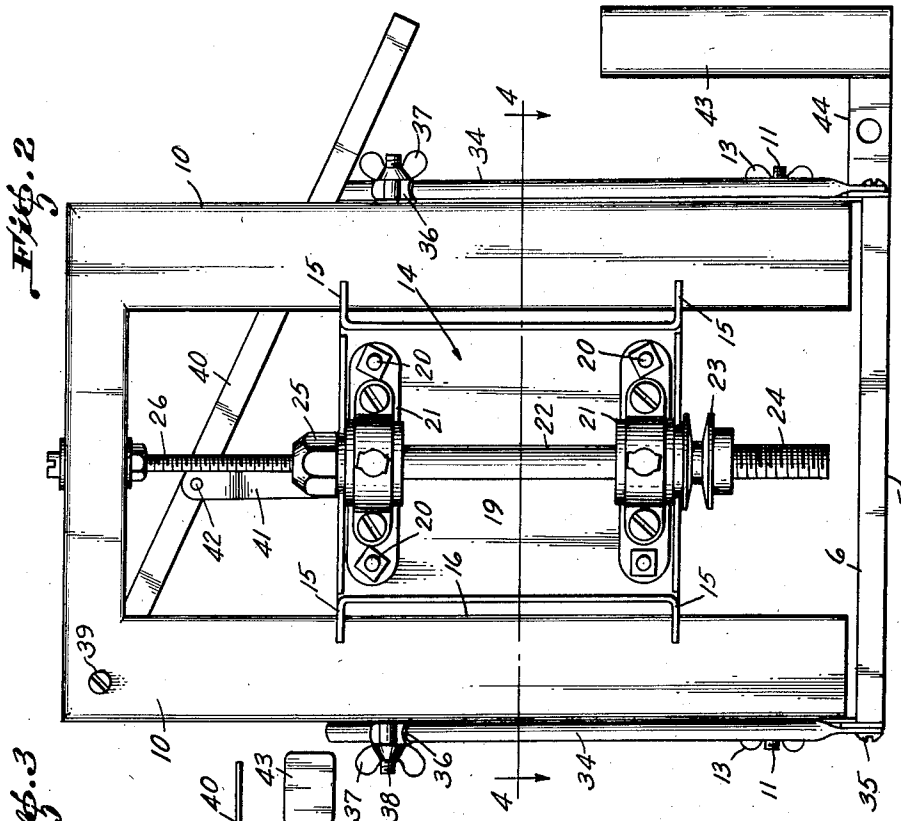


Fig. 3

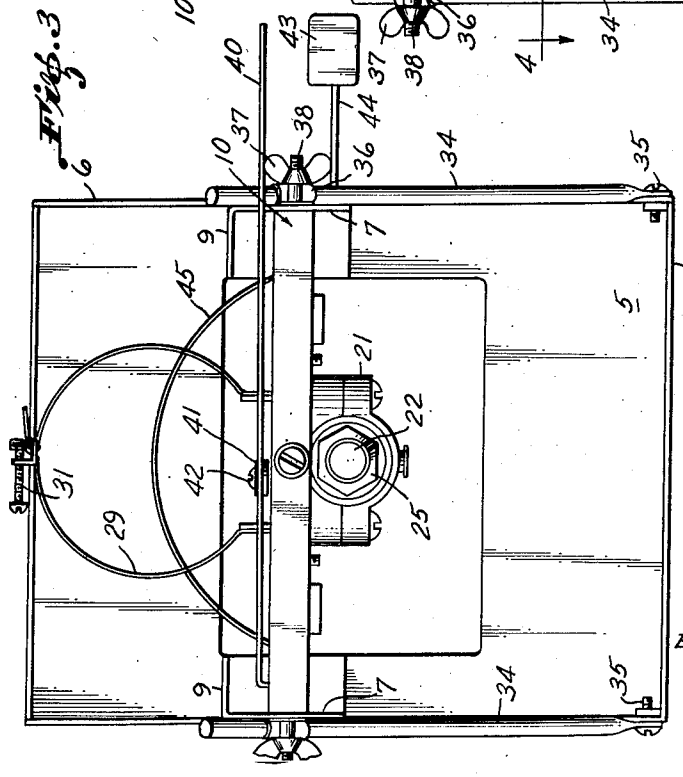
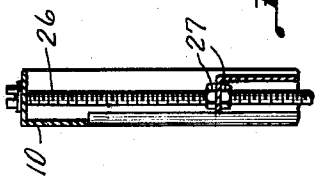


Fig. 5



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United States Patent Office 2,805,691 Patented Sept. 10, 1957

2,805,691

POWER TOOL

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Application October 18, 1954, Serial No. 462,715

7 Claims. (Cl. 144—1)

This invention is a power tool and pertains particularly to means whereby a device of simplified construction may be utilized in accomplishing a variety of operations, such as drilling, sawing, routing, sanding, planing, trimming sharpening, grinding and other kindred services.

The primary object of the invention is to provide means whereby a conventional power tool, such as a small electric drill or motor, may be utilized to furnish the necessary power in bringing about or accomplishing the ends heretofore set forth.

A further object of the invention is to provide structure of simple and inexpensive construction whereby the electric power source may be utilized to furnish the necessary force or power in operating tools for accomplishing results such as heretofore recited, and wherein the structure permits of a variety of adjustments in order that such ends may be accomplished accurately and easily with a minimum expenditure of power and without the exercise of special skill or knowledge on the part of the operator.

A further object of the invention is to provide a structure of the character generally referred to which may be constructed of metal shaped or produced by simple and inexpensive operations, the structure being such as to enable the several parts to be easily, quickly and accurately assembled with a minimum of effort and skill and most economically and yet which is readily adapted for the accomplishment of the various functions to which reference has been made heretofore.

With the foregoing objects in view, together with others which will appear as the nature of the invention is better understood, the invention resides in the novel construction, combination and arrangement of parts, all as will be described more fully hereinafter, illustrated in the drawing, and particularly pointed out in the claims.

In the drawings:

Fig. 1 is a side elevation, parts broken away, of a power tool constructed in accordance with the invention,

Fig. 2 is a front elevation of the improved device,

Fig. 3 is a top plan view of the device shown in Fig. 2,

Fig. 4 is a transverse sectional view taken upon line 4—4 of Fig. 2, and

Fig. 5 is a detail fragmentary sectional view illustrating the manner in which the regulating screw operates the support plate.

Referring now more particularly to the drawing, 5 represents the base or supporting platform of my improved tool, formed preferably of light but durable metal stamped in rectangular form as shown in Figs. 3 and 4 with a shallow upstanding flange 6 at its margins. This base has secured at opposite sides thereof upstanding legs 7 which may be rigidly secured as by screws 8, or in any other desired manner, to opposite sides of the base. Each leg is provided at one side with inwardly extending limiting flange 9.

The invention contemplates a movable platform or plate swingably mounted at its lower end upon the base for angular adjustment with respect thereto. This platform

includes a substantially rectangular frame 10 having the lower ends thereof pivotally connected to the upstanding legs 7 by bolts 11 projecting laterally from the frame and extending through elongated slots 12 in the said legs. Wing nuts 13 may be secured to the ends of these bolts, and it is obvious that this construction permits of upward sliding movement of the frame with respect to the supporting base 5 and the frame may also assume various angular positions with respect thereto, being locked in these various positions of adjustment by tightening the wing nuts 13. It is also apparent that when desirable, the frame may be entirely removed from the supporting legs.

The frame 10 has associated therewith a carriage 14 capable of sliding movement in said frame. This carriage fits within the open frame 10 and is provided with upper and lower laterally projecting guides 15 to slidably engage with trackways 16 at the inner edges of the open frame 10. These trackways each include an inwardly directed angularly disposed portion 17 to be engaged by a similarly disposed edge 18 on each guide, the construction being such as to enable the carriage to freely slide longitudinally of the frame 10 upon the trackways thus provided. The laterally projecting guides 15, being of metal of which the frame is formed and having obround holes through which the bolts 20 pass, may be adjusted to regulate the degree of friction between the guides and the trackways and to compensate for any looseness which may occur due to wear.

The carriage has a flat plate 19 secured thereto as by bolts 20, and this plate is provided on its forward face with spaced bearings 21 rotatably supporting a countershaft 22; the bearings being aligned centrally of the plate and frame and longitudinally thereof. The shaft 22 is provided near its lower end with a belt pulley 23 and the ends of the shaft are threaded as at 24 for the application thereto of various tools for use in connection with the device. The drawings illustrate a nut or hexagonal collar 25 fixedly attached to the upper end of the shaft 22 which, together with the pulley 23 near the lower end of the shaft, prevents end play in said shaft and also provides a means of conveniently holding the shaft, by means of a wrench, against rotation when tightening or untightening tools or chucks. It will be understood that in operation a chuck may be screwed to the lower threaded end 24 of the shaft for use in the usual manner.

The carriage 14 is maintained in adjustment upon the supporting tracks 16 by the elongated screw 26 threaded through the upper portion of the frame 10 and through the upper end of the carriage 14, lock nuts 27 being threaded upon the said screw to hold the latter securely in these predetermined positions.

The pivoted frame 10 carries a power device for driving the jack shaft 22. This power device may include an electric motor or a conventional electric drill indicated at 28. To this end, the carriage is provided on its rear face with an annulus or band 29 to encircle the body of the drill and to clamp the same firmly to the carriage with the shaft 30 of the drill disposed in parallelism with the jack shaft 22. The band may be provided with a screw 31 in order that the annulus may be tightened around the body of the drill. The lower end of the drill shaft 30 has affixed thereto a drive pulley 32 over which passes a belt 33 engaged over pulley 23 of the jack shaft, and it is obvious that with the construction described power from the shaft 30 is transmitted through the belt 33 to the jack shaft 22. The diameters of the pulleys 32—23 will depend upon the rotary speed desired in the jack shaft 22, as will be understood.

The inclination of the frame 10 which carries the power drill and the jack shaft is maintained by means of arms 34 pivoted as at 35 at their lower ends to the for-

ward extremity of the platform or base 8 at the sides thereof and extend through collars 36 carried by the sides of the frame 10 and held in clamped relationship by means of wing nuts 37 threaded upon bolts 38 projecting outwardly from the sides of the frame.

The frame 10 near its upper end has pivoted thereto as at 39 one end of an operating lever 40 which extends across and beyond the opposite side of the frame. This lever has attached thereto an upstanding link 41 pivoted to the said lever as at 42 at one end and similarly connected at its opposite end to the carriage 14. It is apparent that by operating this lever the carriage may be caused to slide up and down upon its trackways.

The tool here described meets the requirements for a more flexible power device which can be easily and quickly adjusted to perform efficiently all operations usually carried out with small power tools, such as accurate drilling at any angle and to control depths, routing, smooth sanding or polishing of flat surfaces, using either disks or drums, sawing at any desired angle and to control depths, or shaping or planing. The structure of the device is such that its basic parts may be quickly stamped from medium or heavy gauge sheet metal thereby making production costs low and at the same time combining maximum strength, rigidity and durability with minimum weight and greatest convenience in manipulation. The base, frame and sliding carriage are formed preferably with angled edges which gives them the necessary rigidity and assures proper alignment of parts. Certain accessories, such as routing guide, ripping fence, sawing table, etc., can be made to fit the base of the tool so that it may be used as a small table saw, shaper, power plane, etc. If found desirable, the device may be equipped with a handle 43 disposed in upstanding position at one side of the base and secured thereto by the arm 44 projecting outwardly from the base to permit of the device being readily handled or manipulated.

In using the device for drilling and routing purposes, the bolt or screw 26 is unscrewed so that when a bit carried by a chuck applied to the lower end of jack shaft 22 is resting upon the work, the space between the head of the screw and the top of the frame equals the desired depth. In descending, when the head of the screw engages the upper end of the frame, further penetration of the bit ceases.

By the employment of a separate tool or jack shaft 22, maximum rigidity for tools carried thereby is provided, and the drill is relieved of strains.

It will be understood that the angularity of the frame with respect to its base may be determined by the well known type of protractor either separate from the device or attached thereto. It will also be understood that a variety of tools may be attached to the lower end of the jack shaft 22 for carrying out such desired operations as rotating shafts can provide. Moreover, the construction of the device enables the frame to be adjusted to any angle with respect to its base or may be brought into parallelism therewith. In instances where the end 24 of the shaft 22 is equipped with a circular saw, the guard 45 will be secured to the rear face of the carriage as a protective element.

The drawing discloses the base 5 provided with an enlarged central rectangular opening which permits of the protrusion therethrough of such attachments as circular saws, sanding drums and other similar devices when the frame 10 is lowered to such position that the jack shaft is substantially parallel to or at slight angles with the base 5.

From the foregoing it is apparent that I have developed a structure of extremely simple and economical construction capable of fully and adequately carrying out the various functions possible where a rotating power shaft is feasible. The flexibility and the adaptability of the device enables the same to be put to many uses too numerous to set forth.

I claim:

1. In a power tool, a horizontally disposed base, a frame rising from said base, a pivot rotatably connecting said frame with said base, said pivot slidable in a vertical plane, a carriage slidably mounted on said frame for movement toward or away from said pivotal connection, a jack shaft rotatably mounted on one side of said carriage in a plane parallel therewith, a motor secured to the opposite side of said carriage, a drive connection between said motor and said shaft, means on said shaft for securing a tool thereto, and means interposed between said base and said frame whereby the latter may be held in various angular positions with respect to said base as well as maintained in vertical adjustment therewith.

2. In a power tool, a base, legs arranged at opposite sides of said base and rising therefrom, said legs having slots therein disposed at substantially right angles to said base, a frame disposed at its lower end between said legs, pivot members projecting laterally from said frame and extending through said slots, nuts engageable with said pivot members to hold said frame in adjusted positions upon said legs, a carriage slidably mounted on said frame for movement toward or away from said pivot members, a jack shaft rotatably mounted on said carriage, a motor carried by said frame, a drive connection between said motor and said shaft, means on said shaft for securing a tool thereto, and means interposed between said base and said frame for maintaining the angularity between said base and said frame.

3. In a power tool, a substantially rectangular base, legs arranged at opposite sides of said base and rising therefrom, each of said legs having a slot therein disposed at right angles to said base, a frame having its lower end disposed transversely of said base and between said legs, pivot members projecting laterally from the lower end of said frame and engaged in said slots, nuts to engage said pivot members to lock the frame between said legs, a trackway on said frame, a carriage slidably mounted on said trackway, a jack shaft rotatably mounted on one side of said carriage, a motor secured to the opposite side of said carriage, a drive connection between said motor and said shaft, means on said shaft for securing a tool thereto, arms pivotally connected at their lower ends to outer extremities of said base at each side thereto, sleeves at the outer end of said frame, said arms engaged in said sleeves, and clamping means for engaging said sleeves with said arms.

4. In a power tool, a base, a frame rising from said base and pivoted thereto, said frame having an opening therein, trackways arranged in parallelism with said frame one at each side of said opening, a carriage, guides on opposite edges of said carriage slidably engaged with said trackways, a jack shaft rotatably mounted on one side of said carriage and parallel therewith, a motor secured to the opposite side of said carriage, a drive connection between said motor and said jack shaft, and means for moving said carriage upon said trackways.

5. In a power tool, a base, legs projecting upwardly in parallelism from the sides of said frame and intermediate the ends thereof, an elongated rectangular frame having its lower end disposed transversely of said base and between said legs, pivots slidably and rotatably securing the lower end of said frame to said legs, arms pivoted one at each side of said base and near an end thereof, collars secured at opposite sides of said frame near the upper end thereof and slidably receiving said arms, clamp means for holding said arms in said sleeves, a carriage mounted for sliding movement upon said frame toward or away from said base, a jack shaft rotatably mounted on one side of said carriage, a motor secured to the opposite side of said carriage, a drive connection between said motor and said jack shaft, and means on said jack shaft for securing a tool thereto.

6. In a power tool, a supporting frame having a rectangular opening thereinfi track members of angular

construction arranged one at each side of said opening and in parallelism with one another, a carriage disposed between said trackways, guides projecting laterally from opposite edges of said carriage and cut away to correspond with the shape of said trackways ands adapted to receive the latter in sliding relationship, a jack shaft mounted on said frame parallel with the longitudinal edges thereof, means for driving said shaft, means on said pack shaft for securing a tool thereto, adjustable means for limiting the sliding movement of said carriage with respect to said frame, and a lever pivoted at one end to said frame and connected to said carriage whereby the latter may be moved upon said trackways.

7. In a power tool, a base, a frame rising from said base and having a central substantially rectangular opening therein, tracks at the edges of said opening parallel with each other and with the standing sides of said frame, a carriage, guides at the sides of said carriage slidably

embracing said tracks, adjusting bolts extending through said carriage and through said guides whereby the latter may be adjusted with respect to said tracks, a jack shaft rotatably mounted on said carriage, means on said carriage for driving said jack shaft, and means on said jack shaft for securing a tool thereto.

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