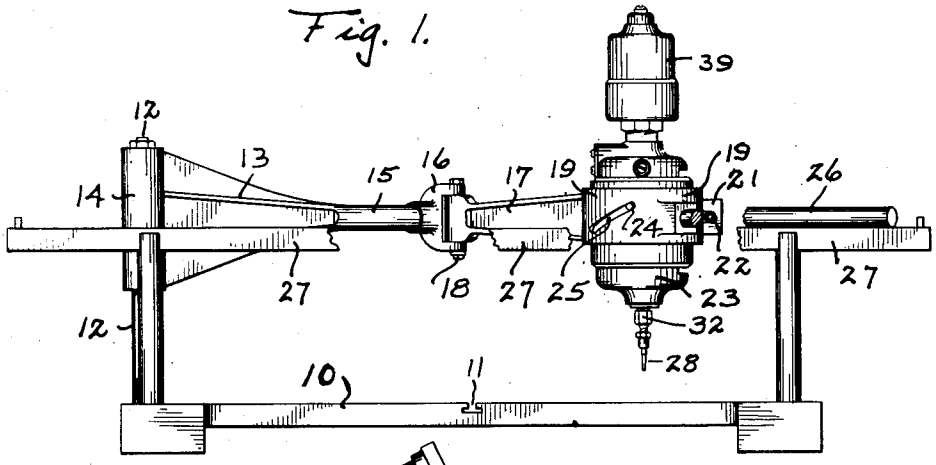
Aug. 23, 1949. J. W. DIXON 2,479,588

ROUTING AND PLANING MACHINE

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Fig. 1.



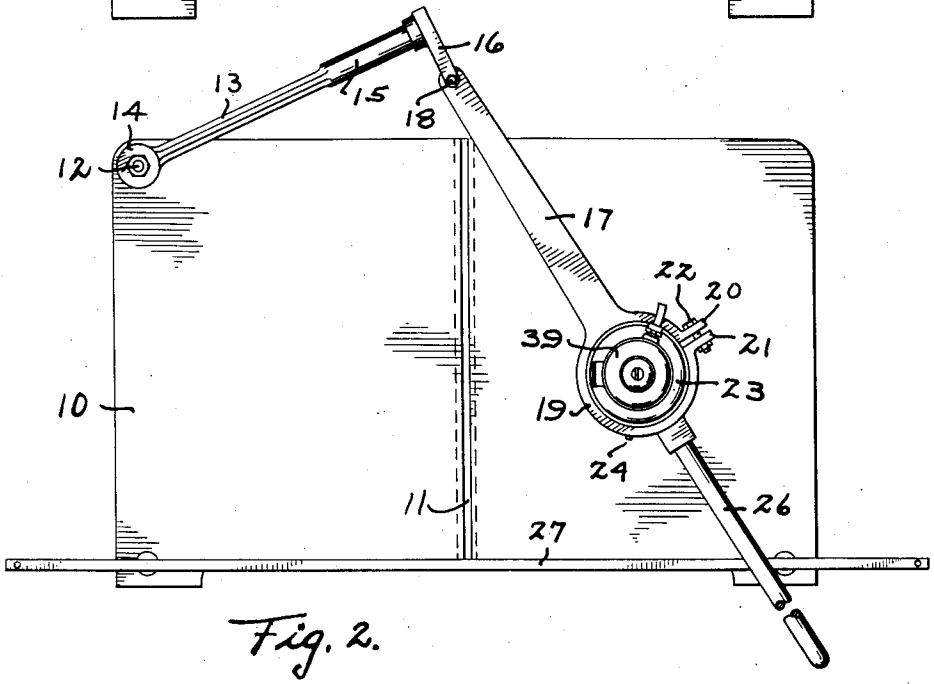


Fig. 2.

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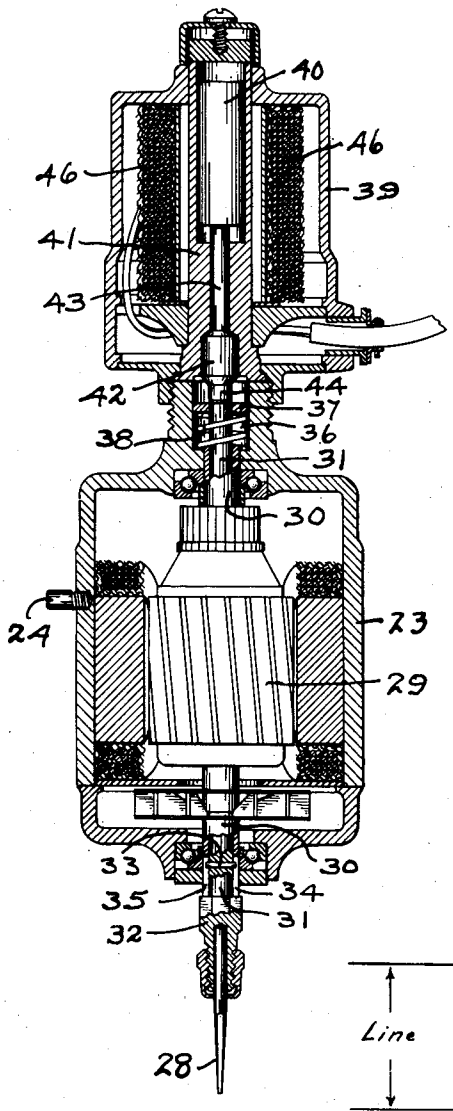


Fig. 3.

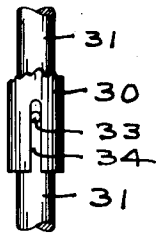


Fig. 4.

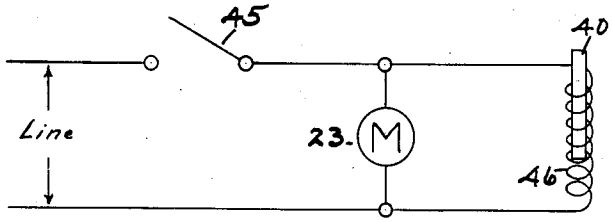


Fig. 5.

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2,479,588

UNITED STATES PATENT OFFICE

2,479,588

ROUTING AND PLANING MACHINE

John W. Dixon, Indianapolis, Ind.; Louise La Von Dixon, administratrix of said John W. Dixon, deceased

Application January 25, 1945, Serial No. 574,461

4 Claims. (Cl. 90—15)

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This invention relates to a router and planer for use in such places as press rooms and composing rooms for routing out cuts, stereotype casts, linotype slugs, or planing them or parts thereof to uniform type-high conditions. A primary object of the invention is that through its use, a high degree of accuracy, high speed, for use on all materials employed by the printing trade may be had. The invention permits results to be obtained within micrometer measurements, and at the same time it is relatively inexpensive to the trade.

These and many other objects and advantages of the invention, including the possible use of the operator of both of his hands with his feet squarely upon the floor without having to use foot pedals or the like, will become apparent to those versed in the art in the following description of one particular form of the invention as illustrated in the accompanying drawings, in which

Fig. 1 is a view in side elevation with parts broken away of a structure embodying the invention;

Fig. 2, a top plan view;

Fig. 3, a vertical, central transverse section through the operating motor and tool elevation control unit on an enlarged scale;

Fig. 4, a detail in side elevation of the tool shaft drive interconnection with the motor shaft; and

Fig. 5, a wiring diagram illustrative of the motor and tool shaft control.

Like characters of reference indicate like parts throughout the several views in the drawings.

A suitable table or base 10 is provided on which the plates or cuts may be placed or secured by any of the conventional methods, such as by clamping within a T slot 11, all as is well known to those versed in the art. A post 12 is mounted to extend vertically above the table 10, and in the present form is shown as being mounted on the table at its left rear corner. A bracket 13 has a long vertical sleeve 14 revolubly telescoping over the upper end of the post 12 to have an arm 15 extending horizontally therefrom to be swung around at a constant elevation above the surface of the table 10.

On the outer free end of this arm 15 is a yoke 16 secured thereon is a fixed manner and between the legs of this yoke is rockably mounted a motor carrier arm 17 to pivot in the yoke 16 on a vertical axis therethrough as defined by the pivot and securing bolt 18. The arm 17 is provided with an integral strap 19 slit on one side

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to have out-turned ears 20 and 21 normally spaced apart one from the other and interconnected by a take up bolt 22 to reduce the internal diameter of the strap 19.

This internal diameter of the strap 19 is made to be such that when the bolt 22 is not drawn up, and the ears 20 and 21 left in their normal spaced apart state, a motor 23 may be received slidingly vertically through the strap 19 and secured then in any desired elevation by being frictionally gripped by the strap 19 as the ears 20 and 21 may be drawn together relatively by taking up the bolt 22. In order to permit micrometer vertical positioning of the motor 23 relative to the strap 19, some means may be provided for lowering and raising the motor 23 upon release of the bolt 22.

In the present form of the invention, such means is shown as consisting of a pin 24 fixed in the housing of the motor 23 to extend outwardly through an inclined slot 25 provided in the strap 19. This mechanism operates to cause the motor 23 to rise relative to the strap 19 by revolving the motor within the strap in a counter-clockwise direction, Figs. 1 and 2, and to lower the motor by revolving the motor in a clockwise direction. That is, as the motor 23 may be turned counter-clockwise, the pin 24 will travel upwardly in that slot 25, and reverse travel of the motor will cause the pin 24 to travel downwardly in that slot. The angle of the slot relative to the horizontal plane will determine the degree of rise and fall in accordance with the amount of rotary travel of the rotor itself. Obviously the lower the angle of the slot 25 the easier it may be to secure fine adjustments of elevation of the motor 23.

At any desired elevation of the motor, the bolt 22 may be taken up so that that elevation may be maintained. In order to hold the elevation of the motor more securely, a lever 26 secured to the arm 17, herein shown as through the strap 19, rides over the bar 27 mounted across the front portion of the table 10 in the present showing. This bar 27 has its upper edge in exact parallel alignment with the top face of the table 10, and as the motor 23 may be shifted around to any desired position over the table 10 by the operating lever 26, the motor 23 will remain in its fixed elevation as above indicated.

The motor 23 drives any type of routing or planing tool 28 that may be desired to be used for the particular job. Now in order to prevent having to bodily lift the motor 23 to lift the tool 28 out of cutting position over any printing sur-

face of a plate or cut or the like that may be on the table 10, a structure is provided whereby the tool 28 is normally held in an open position above that printing surface elevation and is only lowered into cutting position when the motor itself is set into operation. This mechanism is illustrated particularly in Fig. 3.

Within the motor 23 is the usual armature 29 having a shaft 30 extending vertically therefrom and beyond the top and bottom ends. This shaft 30 is tubular and carries slidingly therethrough a tool shaft 31 on the lower end of which is a chuck 32 provided to carry a tool 28. This shaft 31 is longitudinally shiftable through the shaft 30 but is driven thereby by any suitable clutch means herein shown as by a pin 33 fixed through the shaft 31 to engage slidingly in vertical slots 34 and 35 provided in the lower end of the shaft 30.

The upper end of the tool drive shaft 31 extends beyond the upper end of the armature shaft 30 and enters a counter bore 36 provided in the extension of the housing of the motor 23 where a head 37 may travel vertically within that bore 36. A spring 38 bearing by its lower end against the lower end of the counter bore 36 also bears against the underside of the head 37 by its upper end to retain the shaft 31 normally in an upper position. In other words to lower the shaft 31 to bring the tool 28 into a cutting position, the shaft 31 needs to be depressed to overcome the spring 38.

In order that the shaft 31 be depressed only when the motor 23 is set in operation, an electrical operator therefor is provided that may be energized only when the motor 23 is energized. This may be done by placing the operator in circuit with the motor circuit such as is indicated in Fig. 5 of the wiring diagram.

This operator consists essentially of a solenoid magnet carried within a housing 39 mounted on the upper end of the housing of the motor 23, herein shown as by screw threaded engagement with that portion of the motor housing which carries the counter bore 36. Centrally mounted within the housing 39 is a metal armature 40 guided within a cylinder 41 to confine the armature 40 to vertical travel.

A plunger 42 is axially carried by the lower end of the cylinder 41 and has a stem 43 extending on up through the cylinder to be in the path of the armature 40. The lower end of the plunger 42 by a reduced diameter portion 44 normally rests on the upper end of the shaft 31. The stem 43 is longitudinally guided within a reduced diameter bore in the cylinder 41 and has a sliding fit so that the plunger normally drops by gravity to the position above indicated. Furthermore, this normal position is further secured by the weight of the armature 40 bearing on the upper end of the stem 43. The spring 38 is of sufficient strength to support both the plunger 42 and its attached parts plus the armature 40 while at the same time holding the shaft 31 in its uppermost position as indicated in Fig. 3.

Now when the motor 23 is energized by closing the switch 45, Fig. 5, to receive current from a line source, the winding 46 of the solenoid is simultaneously energized since it is in circuit with the motor 23, herein shown as in parallel connection. Upon the energizing of the coil 46 the armature 40 is pulled downwardly within the winding 46, the winding having sufficient turns to pull the armature 40 down to compress the spring 38 and lower the shaft 31 and consequently the tool 28 to its lowermost cutting position as determined by the lower end of the armature 40 striking the lower end of the armature bore in the cylinder 41, thereby establishing a fixed position for the tool. The action of the solenoid is of sufficient power to retain the armature in that lowered position against the normal resistance of the tool 28 in cutting the metal of the plate or cut. Then the tool 28 may be guided about over the metal being cut simply by shifting the lever 26 in the desired direction by sliding it over the bar 27. Then when the cutting is to be discontinued, the switch 45 is allowed to open so that both the motor 23 and the solenoid winding 46 are de-energized whereupon the tool 28 is immediately raised by the spring 38 even before the armature 29 comes to a stop. In other words, as long as the tool 28 is in the cutting position the winding 46 remains energized, and immediately upon any opening of the circuit the tool 28 is pulled upwardly.

While I have herein shown and described the invention in the one particular form, it is obvious that changes may be made in both the mechanical and electrical designs of the various parts and circuits all without departing from the spirit of the invention, and I do not desire to be limited to that precise form beyond the limitations as may be imposed by the following claims.

I claim:

1. In a routing and planing machine, a motor; motor carrying means shiftable horizontally; means for adjusting and fixing the motor on said means at selected elevations; tool carrying means carried by said motor, vertically shiftable thereof; means normally yieldingly holding said tool carrying means in an upper position of said vertical travel; and electrically operated means energized and de-energized simultaneously with said motor overcoming said holding means and shifting said tool carrying means to a lower position of its said vertical travel; and means confining said motor carrying means to travel at a fixed elevation.

2. In a routing and planing machine, a motor; motor carrying means shiftable horizontally; means for adjusting and fixing the motor on said means at selected elevations; tool carrying means carried by said motor, vertically shiftable thereof; means normally yieldingly holding said tool carrying means in an upper position of said vertical travel; and electrically operated means energized and de-energized simultaneously with said motor overcoming said holding means and shifting said tool carrying means to a lower position of its said vertical travel; said motor having a tubular armature shaft; said tool carrying means comprising a tool chuck, and a shaft carrying the chuck and slidingly telescoping within said armature shaft; and tool carrying holding means comprising a spring interposed between abutments on said motor and said chuck shaft.

3. In a routing and planing machine, a motor; motor carrying means shiftable horizontally; means for adjusting and fixing the motor on said means at selected elevations; tool carrying means carried by said motor, vertically shiftable thereof; means normally yieldingly holding said tool carrying means in an upper position of said vertical travel; and electrically operated means energized and de-energized simultaneously with said motor overcoming said holding means and shifting said tool carrying means to a lower position of its said vertical travel; said motor having a

tubular armature shaft; said tool carrying means comprising a tool chuck, and a shaft carrying the chuck and slidingly telescoping within said armature shaft; and tool carrying holding means comprising a spring interposed between abutments on said motor and said chuck shaft; said electrically operated means comprising an electro-magnet, and an armature for depressing said shaft.

4. In a routing and planing machine, a motor; motor carrying means shiftable horizontally; means for adjusting and fixing the motor on said means at selected elevations; tool carrying means carried by said motor, vertically shiftable thereof; means normally yieldingly holding said tool carrying means in an upper position of said vertical travel; and electrically operated means energized and de-energized simultaneously with said motor overcoming said holding means and shifting said tool carrying means to a lower position of its said vertical travel; said motor having a tubular armature shaft; said tool carrying means comprising a tool chuck, and a shaft carrying the chuck and slidingly telescoping within said armature shaft; and tool carrying holding means comprising a spring interposed between

abutments on said motor and said chuck shaft; said electrically operated means comprising a solenoid magnet mounted on the motor, an armature shiftable by said magnet, means transmitting movement induced by said magnet of the magnet armature to produce downward travel of said tool chuck shaft in opposition to said spring.

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