June 12, 1934. J. A. RICHARDS 1,962,524

ROUTING MACHINE

Filed Aug. 3, 1932 2 Sheets-Sheet 1

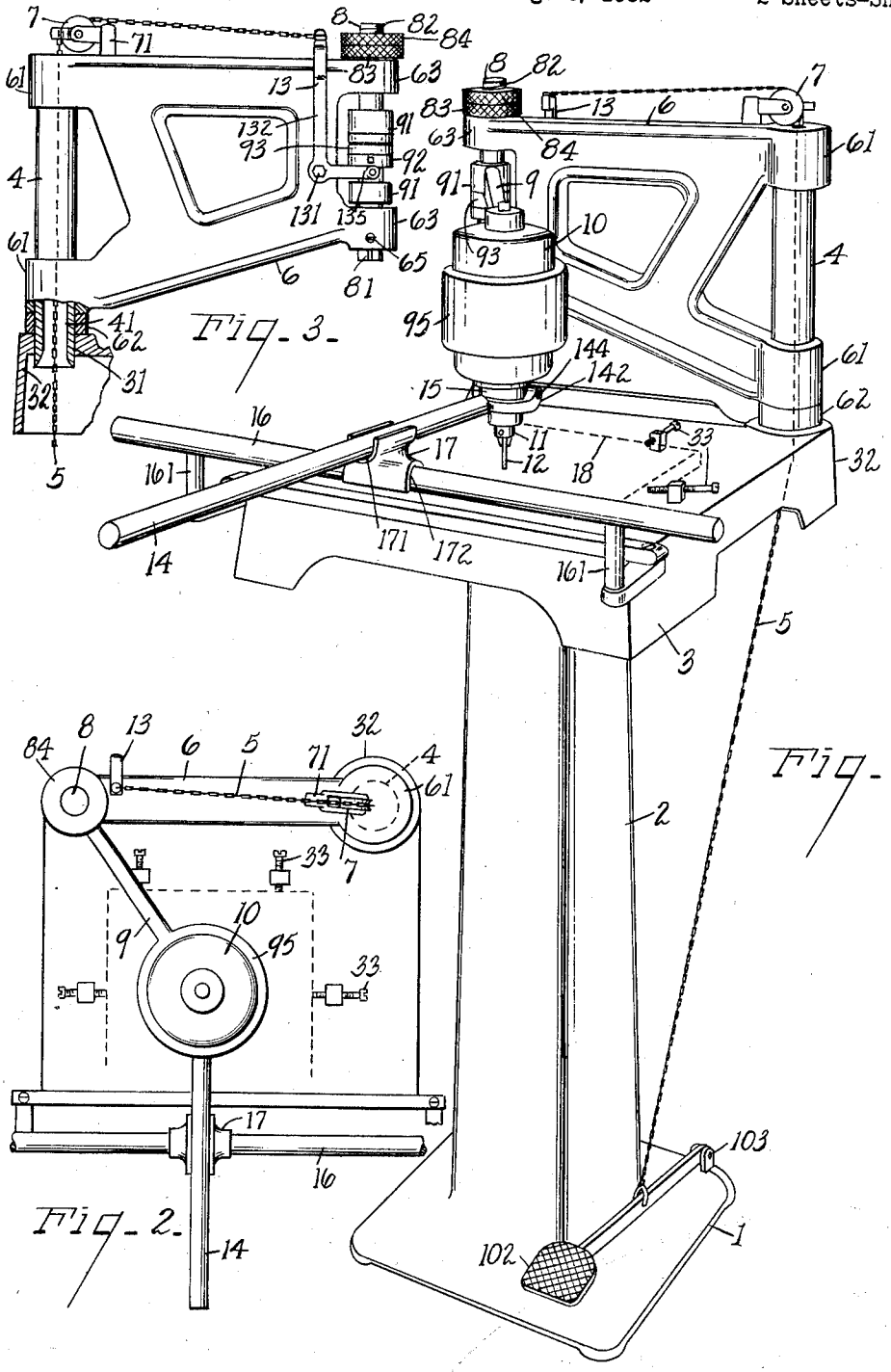


Fig. 1.

Fig. 2.

Fig. 3.

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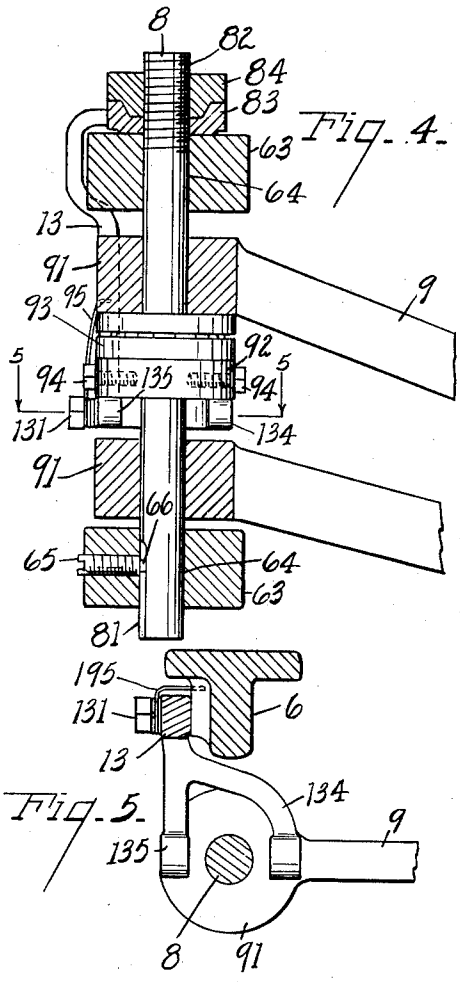


Fig. 4.

Fig. 5.

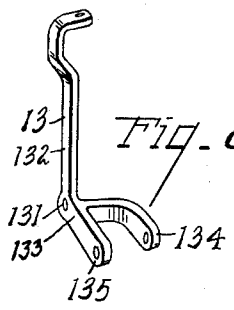
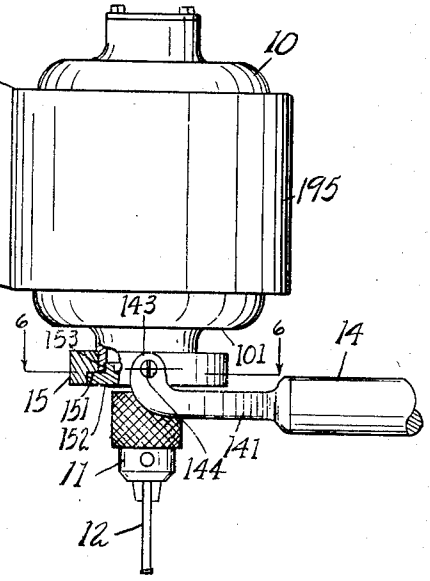


Fig. 8.



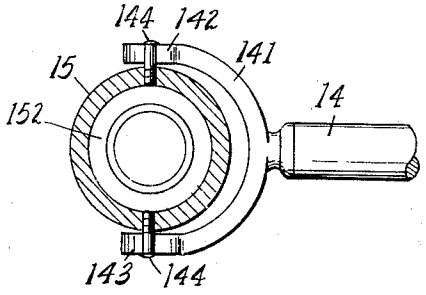


Fig. 6.

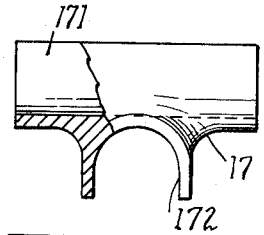


Fig. 7.

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ROUTING MACHINE

John A. Richards, Kalamazoo, Mich.

Application August 3, 1932, Serial No. 627,347

7 Claims. (Cl. 90—15)

The main objects of this invention are:

First, to provide an improved routing machine with a rapidly revolving spindle and cutter for scooping out the surfaces of wood or metal, as for blanks on an electrotype.

Second, to provide a routing machine having improved means for manually controlling the movement of the cutter.

Third, to provide a router having guide means for confining the movement of the cutter to transverse and longitudinal lines.

Fourth, to provide a router having a control handle associated with the outer radial bracket for rotation about the vertical axis of the cutter and also about a horizontal axis intersecting the cutter axis, whereby the movement of the cutter may be fully controlled by the handle.

Fifth, to provide a guide for controlling the movement of the cutter through the control rod and top rail.

Sixth, to provide a router with a motor having a vertical spindle and cutter mounted for horizontal movement.

Seventh, to provide improved flexible means for manually controlling the movement of said motor.

Eighth, to provide a router having the above features, which is simple in construction, economical to manufacture, and efficient and effective in operation.

Objects relating to details and economies of my invention will appear from the description to follow. A structure which is a preferred embodiment of my invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a perspective view of a routing machine embodying the features of my invention.

Fig. 2 is a fragmentary top plan view of the machine.

Fig. 3 is a fragmentary view in rear elevation.

Fig. 4 is an enlarged fragmentary view of the outer bracket assembly mainly in side elevation and partially in vertical section.

Fig. 5 is a fragmentary horizontal section on line 5—5 of Fig. 4.

Fig. 6 is a fragmentary horizontal section on line 6—6 of Fig. 4.

Fig. 7 is an enlarged front elevation of the guide having a portion broken away and shown in vertical section.

Fig. 8 is a perspective view of the bell crank lever.

The parts are identified by their numerals of reference which are the same throughout the several views.

In the drawings, 1 is the base, 2 the column on said base, and 3 the table at the top of the column. 4 is the column mounted on the table 3 in the opening 31 at the right rear corner 32 thereof, the standard 4 being provided with a vertical cable hole or opening 41 for the passage of the cable 5, the latter preferably being in the form of a metal chain.

6 is the inner radial bracket having vertically spaced rearwardly extending arms 61 which are journaled to the standard 4, the lower arm resting on the supporting ball bearing 62 which in turn rests on the table 3. 7 is the grooved wheel mounted on the inner bracket 6 by means of the support 71, the groove being disposed in line with the cable hole 41 in the standard 4. At its front end, the inner bracket 6 is provided with vertically spaced forwardly extending arms or ears 63 having vertically alined shaft openings 64.

8 is the vertical shaft which is carried by the arm 63 in said journal openings 64 for vertical adjustment, the shaft having a vertical groove 81 which coacts with the screw 65. The screw has a reduced end 66 projecting into the groove 81 which permits the vertical adjustment of the shaft 8. The upper end of the shaft 8 is threaded at 82 for coaction with the adjusting nut 83 which is adapted to be secured in place by the lock nut 84, the nuts being knurled around their periphery for facilitating their manual adjustment.

9 is the outer radial bracket having vertically spaced rearwardly extending arms 91 which are journaled to the shaft 8 and are supported thereon by the fixed collar 92 and the ball bearing 93, the latter being disposed between the upper arm and the collar 92. The collar is secured to the shaft 8 by means of set screws 94. At its forward end, the outer bracket 9 is provided with a cylindrical portion 95 encircling and carrying the electric motor 10 having a vertical spindle 11 and cutter 12.

13 is the bell crank lever which is pivoted to the inner bracket 6 at 131 and comprises an upstanding arm 132 and a forked lateral arm 133. The forked members 134 and 135 are disposed below and in engagement with the fixed collar 92 on the shaft 8, whereby the latter and the outer bracket 9 are elevated on the rocking of the bell crank lever 13.

102 is the foot pedal pivoted to the base 1 at 103 and to which the lower end of the cable 5 is connected, the other end of the cable being connected to the upstanding arm 132 of the bell crank

lever 13. The arrangement is such that when the foot pedal 102 is depressed, the outer bracket 9 is elevated, the upward movement of the bracket being limited by the engagement of the upper arm 91 with the upper ear 63. The elevation of the outer bracket with respect to the table 3 is adjustable through the adjusting nut 83 which supports the shaft 8 and is in turn supported by the upper ear 63.

14 is the control rod or handle which is provided with a forked end 141, the members 142 and 143 of which are curved to form a semicircle.

15 is the collar which is journaled to the motor 10 concentric with the spindle 11, the forked members 142 and 143 being pivoted to the collar 15 by means of the pivot pins 144. The arrangement is such that the control rod 14 is free to rotate concentric with the spindle 11 and also about a horizontal axis intersecting the vertical axis of the spindle. The collar 15 is provided with an internal shoulder 151 which rests on and is supported by the nut 152, the latter being carried by the internal threads 153 of the end member 101 of the motor 10.

16 is the top rail which is mounted on the front edge of the table 3 by means of the spaced brackets 161, the top rail 16 being disposed above the table.

17 is the guide which is preferably in the form of a casting and is provided with a top groove 171 and a bottom groove 172, the grooves being arranged at right angles to each other and facing in opposite directions. The top groove 171 is adapted to receive the control rod 14, while the bottom groove 172 is adapted to receive the top rail 16, the arrangement being such that the control rod 14 may be slid longitudinally in its groove or the guide moved longitudinally on the top rail 16.

The dotted lines 18 represent an electrotype or stereotype mounted on the table 3 and held in position thereon by means of the screw 33. The cutter 12 may be used to scoop out portions of the electrotype 18 by manipulating the handle 14 and the foot pedal 102. If it is desirable to move the cutter 12 in straight longitudinal or transverse lines, this may be accomplished by using the guide 17. However, if it is desired to move the cutter at will, the guide may be dispensed with and the handle 14 manipulated with or without the top rail 16. The cutter 12 is elevated to clear the plate 18 by depressing the foot pedal. On releasing the foot pedal, it returns to its lowermost position by gravity, this action being supplemented by the spring 195 having one end secured to the upper arm 91 and the lower end to the forked member 135 and urging the bell crank lever to its initial position.

The guide provides straight line control in two directions for mortising shell plates, rabbetting, border work, and the like. The adjusting nut 83 provides means for regulating the depth of the cut and typhi planing. For stationary spindle work, the arms may be locked in fixed position. By means of the foot pedal, the router or planer head may be instantly raised while in operation. The machine is capable of use as a multiform radial router, typhi planer, a shell plate mortiser, and similar precision work.

It is obvious that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of my invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims.

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

1. A router comprising a base, a column on said base, a table on said column, a standard mounted in an opening at the corner of said table and having a vertical cable hole, a foot pedal pivoted to said base, an inner radial bracket having vertically spaced rearwardly extending arms journaled to said standard and having vertically spaced forwardly extending arms, a vertical shaft non-rotatably carried by said arms for vertical adjustment, a nut threaded to said shaft and resting on the top front arm for adjusting said shaft vertically, a lock nut threaded to said shaft for engaging said nut, a collar fixed to said shaft between said arms, a ball bearing on said collar, an outer radial bracket having spaced ears journaled to said shaft with one resting on said ball bearing, a motor having a vertical spindle and cutter mounted in the end of said outer bracket above said table, a top rail mounted on the front of said table, a collar journaled to said motor concentric with said spindle, a control rod having a forked end pivoted to said collar for swinging on a horizontal axis bisecting the spindle axis, a guide having top and bottom grooves arranged at right angles for slidably receiving said rod and rail respectively, a bell crank lever pivoted to the side of said inner bracket and having a forked end engaging the collar on said shaft and an upper end extending above said inner bracket, a spring urging said lever to an initial position, a grooved wheel mounted on said inner bracket with the groove in line with said cable hole in the standard, and a cable extending through said hole and in said groove and connecting said foot pedal and the upper end of said lever for elevating the shaft and outer bracket assembly on the depression of the foot pedal.

2. A router comprising a base, a column on said base, a table on said column, a standard mounted at the corner of said table and having a vertical cable hole, a foot pedal pivoted to said base, an inner radial bracket journaled to said standard and having vertically spaced front arms, a vertical shaft carried by said arms only for vertical adjustment, a nut threaded to said shaft and resting on the top arm for adjusting said shaft vertically, a lock nut threaded to said shaft for engaging said nut, a collar fixed to said shaft between said arms, an outer radial bracket having spaced ears journaled to said shaft with one supported by said collar, a motor having a vertical spindle and cutter mounted in the end of said outer bracket above said table, a top rail mounted on said table, a collar journaled to said motor concentric with said spindle, a control rod having a forked end pivoted to said collar for swinging on a horizontal axis, a guide having top and bottom grooves arranged at right angles for receiving said rod and rail respectively, a bell crank lever pivoted to the side of said inner bracket and having a forked end engaging the top collar on said shaft and an upper end extending above said inner bracket, a spring urging said lever to an initial position, a grooved wheel mounted on said inner bracket with the groove in line with said cable hole in the standard, and a cable extending through said hole and in said groove and connecting said foot pedal and the upper end of said lever for elevating the shaft and outer

bracket assembly on the depression of the foot pedal.

3. A router comprising a base, a column on said base, a table on said column, a standard mounted on said table and having a vertical cable hole, a foot pedal pivoted to said base, an inner radial bracket journaled to said standard and having vertically spaced arms, a vertical shaft carried by said arms for vertical adjustment, a nut threaded to said shaft and resting on the top arm for adjusting said shaft vertically, a collar fixed to said shaft between said arms, an outer radial bracket having spaced ears journaled to said shaft with one supported by said collar, a motor having a vertical spindle and cutter mounted on the end of said outer bracket above said table, a top rail mounted on said table, a collar journaled to said motor concentric with said spindle, a control rod having a forked end pivoted to said collar for swinging on a horizontal axis, a guide having top and bottom grooves arranged at right angles for receiving said rod and rail respectively, a bell crank lever pivoted to said inner bracket and having a forked end engaging the top collar on said shaft and an upper end extending above said inner bracket, a grooved wheel mounted on said inner bracket with the groove in line with said cable hole in the standard, and a cable extending through said hole and in said groove and connecting said foot pedal and the upper end of said lever for elevating the shaft and outer bracket assembly on the depression of the foot pedal.

4. A router provided with a substantially horizontal table having a vertical hole in the corner thereof, a standard mounted on said table in said hole and having a vertical cable hole, a radial inner bracket journaled to said standard and having vertically spaced ears provided with alined vertical shaft openings, a vertical shaft in said openings, means for adjusting said shaft vertically, a radial outer bracket journaled to said shaft and vertically movable therewith, a bell crank lever pivoted to said inner bracket and having a forked arm engaging a collar on said shaft, a foot pedal, and a cable connecting said bell crank lever and said foot pedal for elevating the shaft and outer bracket when the foot pedal is actuated, the cable extending through said vertical holes in the standard.

5. A router provided with a table having a vertical hole, a standard mounted on said table in said hole and having a vertical cable hole, a radial inner bracket journaled to said standard and having vertically spaced ears provided with alined vertical shaft openings, a vertical shaft in said openings, means for adjusting said shaft vertically, a radial outer bracket journaled to said shaft and vertically movable therewith, a bell crank lever pivoted to said inner bracket and having a forked arm engaging a collar on said shaft, a foot pedal, and a cable connecting said bell crank lever and said foot pedal for elevating the shaft and outer bracket when the foot pedal is actuated, the cable extending through said vertical holes in the table and standard.

6. A router provided with a table, a standard mounted on said table and having a vertical hole, a radial inner bracket journaled to said standard, a vertical shaft carried by said bracket, means for adjusting said shaft vertically, a radial outer bracket journaled to said shaft and vertically movable therewith, a lever pivoted to said inner bracket and having an arm for elevating said shaft, a pedal, and a cable connecting said lever and said pedal for elevating the shaft and outer bracket when the foot pedal is actuated, the cable extending through said vertical holes in the standard.

7. A router provided with a motor having a spindle and cutter, a collar journaled to said motor concentric with said spindle, and a control rod having a fork pivoted to said collar for movement in the plane of said spindle about an axis intersecting the axis of said spindle.

JOHN A. RICHARDS.