S. HUNTER.

ELECTRIC ROUTING MACHINE.

APPLICATION FILED DEC. 4, 1913.

1,109,755.

Patented Sept. 8, 1914.

2 SHEETS—SHEET 1.

Fig. 1.

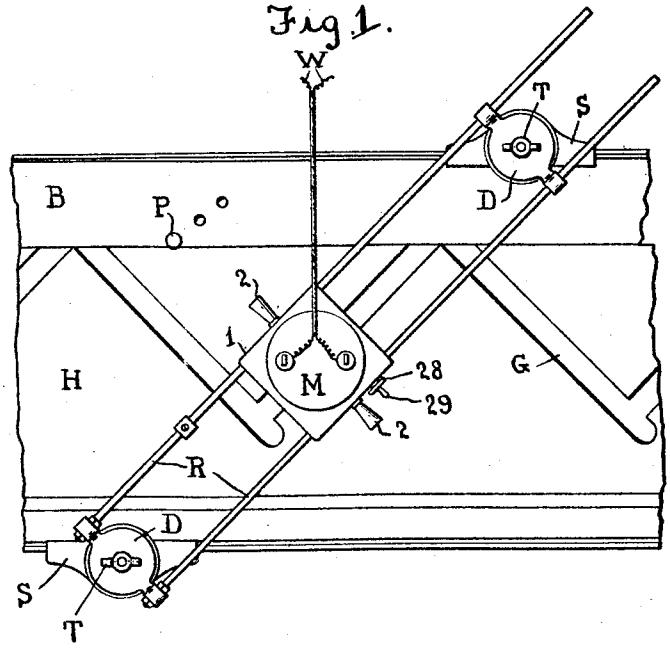



Fig. 2

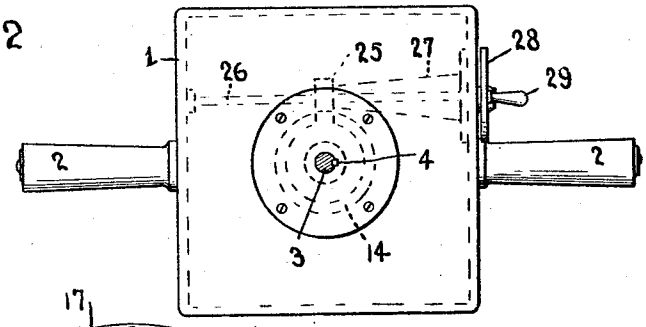



Fig. 7.

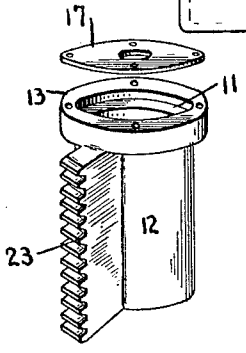
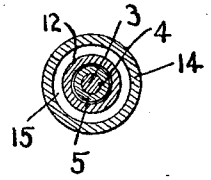



Fig. 5.




Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

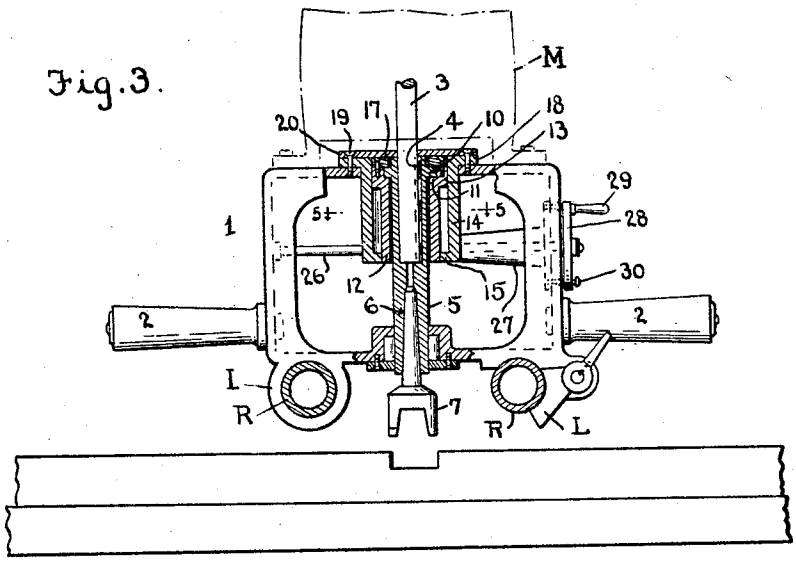



Fig. 4.

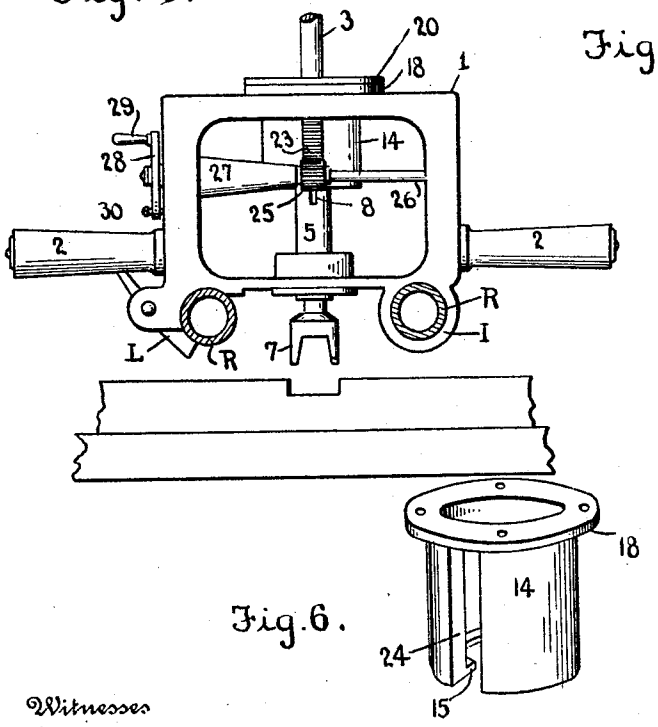



Fig. 8.

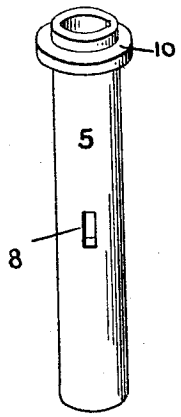



Fig. 6.




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# UNITED STATES PATENT OFFICE.

SAMUEL HUNTER, OF PITTSBURGH, PENNSYLVANIA.

## ELECTRIC ROUTING-MACHINE.

1,109,755. Specification of Letters Patent. Patented Sept. 8, 1914.

Application filed December 4, 1913. Serial No. 804,694.

*To all whom it may concern:*

Be it known that I, SAMUEL HUNTER, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Electric Routing-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to woodworking machines, and more especially to routers; and the object of the same is to effect certain improvements on the machine illustrated and described in my patent number 1,083,212, dated December 30, 1913, whereby the structure shown therein is simplified and is driven by an electric motor.

This and other objects are accomplished by constructing the machine in the manner hereinafter more fully described and claimed, and as shown in the drawings wherein—

Figure 1 is a plan view of the entire machine at work. Fig. 2 is an enlarged plan view of the carriage. Fig. 3 a front elevation thereof partly in section, and Fig. 4 a rear elevation omitting the motor. Fig. 5 is a cross section on the line 5—5 of Fig. 3. Figs. 6, 7 and 8 are perspective details of parts.

In the drawings, and more particularly in Fig. 1 thereof, are shown several parts which are employed to make this machine operative, and some of them are fully described in my companion application above referred to.

The letter B designates a workbench or bed whereon is shown a stair horse H whose grooves G are to be cut by this machine, said piece of work being held on the bed between pins P sunk into it or in any preferred manner. Sliding along the edges of the bed are slides S, upon each of which is mounted a disk D held thereon by a thumb screw T, and the two disks are connected by rods R as shown. The carriage of this machine yet to be described has eyes I at one side slidably and rotatably mounted on one rod as best seen in Fig. 4, and a latch L at the other side slidably but detachably engaging the other rod, so that when disengaged therefrom the entire carriage can be tilted to gain access to the bit as when the latter must be changed. These details form no part of the present invention, nor do the motor M and its wires W as referred to below.

The carriage 1 is a rectangular skeleton structure of metal having handles 2 projecting from its opposite sides so that it may be shifted longitudinally along the rods R, and eyes I and a latch L depending from its base as above described and for the purpose already set forth. The motor M is secured upon the top of the carriage by any suitable means, and its power shaft 3 depends into the carriage and is splined as at 4 within a tubular stock 5 whose bore is tapered at its lower end as at 6 so as to receive the shank of the bit. 7, the latter being driven out of the stock by inserting a tool through a transverse opening 8 in said stock as shown. The shape of the active end of the bit is such that it will cut the grooves G in a stair horse H as shown, and in order that the grooves for the risers and treads shall stand at right angles to each other the tracks (which are the rods R) must be disposed across the work H at an angle of 45° as shown in Fig. 1. The width of the groove G depends upon the size of the cutting head of the tool, and the depth of said groove depends upon the extent to which the stock and bit are fed downward in a manner yet to be described. Around the upper end of said stock is an annular flange 10 which rests on a shoulder 11 formed around the upper end of a sleeve 12 (Fig. 7) and inside a flange 13 which latter is of a size to fit slidably within a tubular casing 14 (Fig. 6) while the lower end of the casing is inturned into a flange 15 which slidably incloses the cylindrical body of the sleeve 12 as seen in Fig. 3. The sleeve is thus guided at two points—once where its enlarged upper end 13 slides within the casing, and once where its reduced body slides within the reduced bore of the flange 15 at the lower end of the casing; and the stock 5 is rotatably mounted within said sleeve and depends for a considerable distance below the lower end thereof. Screwed to the

upper end of the flange 13 on the sleeve 12 is a ring 17 overlying the flange 10 on the stock 5, and which ring with the shoulder 11 forms a channel for the rotation of said flange 10. The upper end of the casing has an outwardly projecting flange 18 which is fastened to the carriage by screws 19, and a cover plate 20 preferably overlies said flange 18 and is held thereon by the same screws so that the entire mechanism is housed within the casing as best seen in Fig. 3. With the mechanism thus far described, when the current is switched on and the motor rotates, the power shaft 3 will rotate the stock 5 and the latter will drive whatever bit 7 is inserted in its lower end; and meanwhile the entire carriage can be moved along the track by its handles 2 so that the groove G can be formed in the work H as desired.

While the stock 5 rotates within the sleeve 12, the latter is only slidably mounted within the casing 14. The casing at one side has an upright slot 24, and through this projects an upright rack bar 23 which extends from the corresponding side of the sleeve 12. The teeth of this rack bar are engaged by a gear wheel 25 which is carried by a shaft 26 mounted in suitable bearings 27 within the carriage as best seen in Fig. 2. At one end this shaft carries a crank disk 28 having a handle 29, and at another point in said disk a set screw 30 projects through it and is adapted to be adjusted into close contact with the side wall of the carriage. When now this set screw is loosened and the disk rotated by means of its handle 29, the rotation of the shaft 26 turns the gear 25 so that the teeth of the latter which intermesh with the rack bar cause the rise and fall of the sleeve and all parts that are carried thereby—the splining of the power shaft 3 within the stock 5 permitting. By this means or by any equivalent means for adjusting the sleeve vertically within the casing 14, the boring mechanism may be moved up and down without interrupting its rotary movement, and hence the operator is at liberty to feed the bit to its work and to make the grooves G as deep as required. The parts of this machine are by preference of metal, and considerable latitude will be allowed the manufacturer in its construction.

While I have shown the track mechanism for supporting the carriage which is fully illustrated and described in my companion application above referred to, I reserve the right to mount this carriage on any suitable track and to drive it by any suitable electric motor, or, in fact, by other types of motor if desired.

What is claimed as new is:

1. In a wood working machine the combination with a carriage, and means for movably supporting it above the work; of an upright tubular casing within said carriage having a slot at one side, a tubular sleeve slidably mounted in the casing and having a rack bar projecting through said slot, a tubular stock rotatably mounted within said sleeve, means for preventing it from moving longitudinally therein, a power-driven shaft splined into the upper end of said stock, a bit at the lower end of the stock, and adjusting mechanism including a gear wheel engaging said rack bar.

2. In a wood working machine, the combination with a carriage, and means for movably supporting it above the work; of an upright tubular casing within said carriage having a slot at one side, a tubular sleeve slidably mounted in the casing and having a rack bar projecting through said slot, a tubular stock rotatably mounted within said sleeve and having a flange around it near its upper end, a flange around the upper end of the sleeve having an internal shoulder beneath the flange of the stock, a ring secured to the flange of the sleeve above that of said stock, a bit at the lower end of the stock, and adjusting mechanism including a gear wheel engaging said rack bar.

3. In a wood working machine, the combination with a carriage, and means for movably supporting it above the work; of a tubular casing having a radial flange at its upper end and an upright slot in its rear wall, connections between said flange and carriage, a tubular sleeve having a radial flange at its upper end loosely fitting within said casing and an upwardly facing shoulder within this flange, an internal flange at the lower end of the casing loosely fitting around said sleeve, an upright rack bar on the rear of the latter movably mounted in the slot in the casing, a tubular stock having a radial flange near its upper end resting on the shoulder of the sleeve, a ring secured on the upper edge of the flange of the sleeve over said flange of the stock, a power-driven shaft splined into the upper end of the stock, a bit carried by its lower end, a shaft journaled in the carriage and having a gear engaging said rack bar, a crank disk on the outer end of the shaft, and a set screw through said crank disk, for the purpose set forth.

4. In a wood working machine, the combination with a carriage, and means for movably supporting it above the work: of a tubular casing having a radial flange at its upper end and an upright slot in its rear wall, connections between said flange and carriage, a tubular sleeve loosely fitting within said casing, an upright rack bar on the sleeve movably mounted in the slot in the casing, a tubular stock journaled in said sleeve, a power-driven shaft splined into

the upper end of the stock, a bit carried by its lower end, a shaft journaled in the carriage and having a gear engaging said rack bar, a crank disk on the outer end of the shaft, and a set screw through said crank disk, for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

SAMUEL HUNTER.

Witnesses:
EARLE ARMSTRONG,
C. ARTHUR GARDINER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."