March 25, 1930. S. HUNTER 1,751,816

ROUTING MACHINE

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Fig. 1.

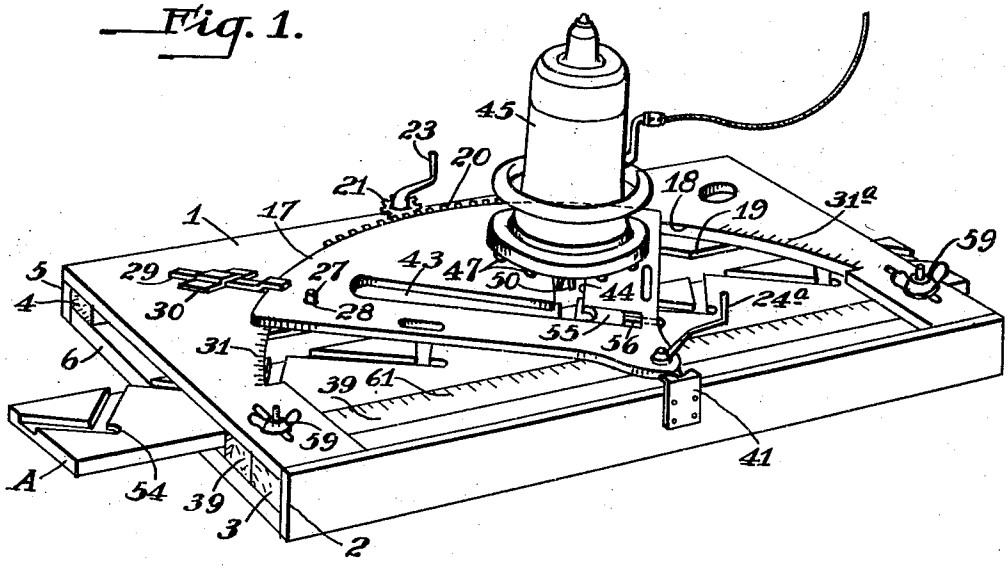
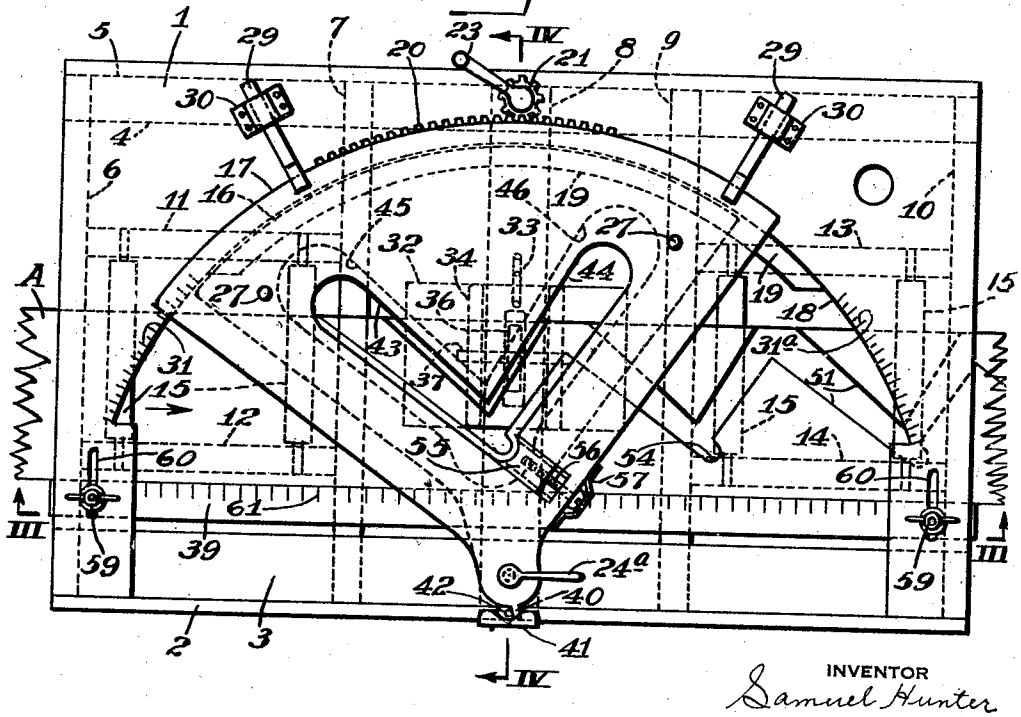


Fig. 2.



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Fig. 3.

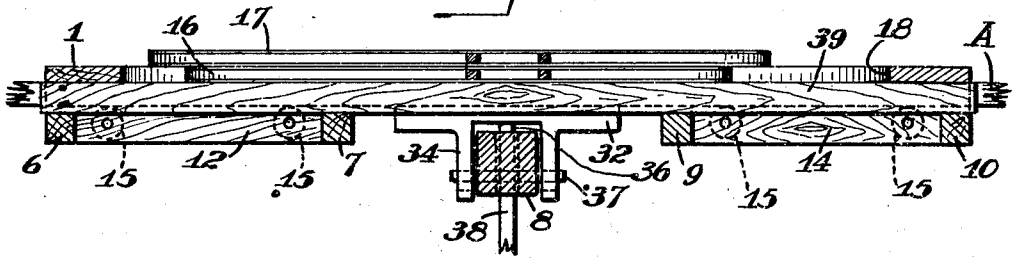


Fig. 4.

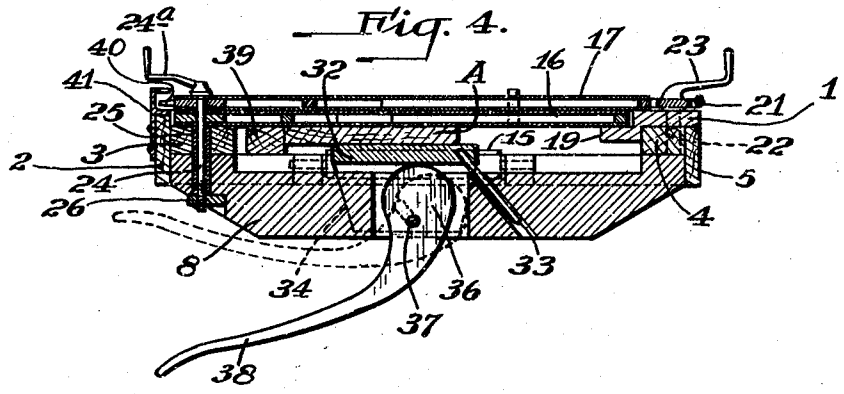


Fig. 5.

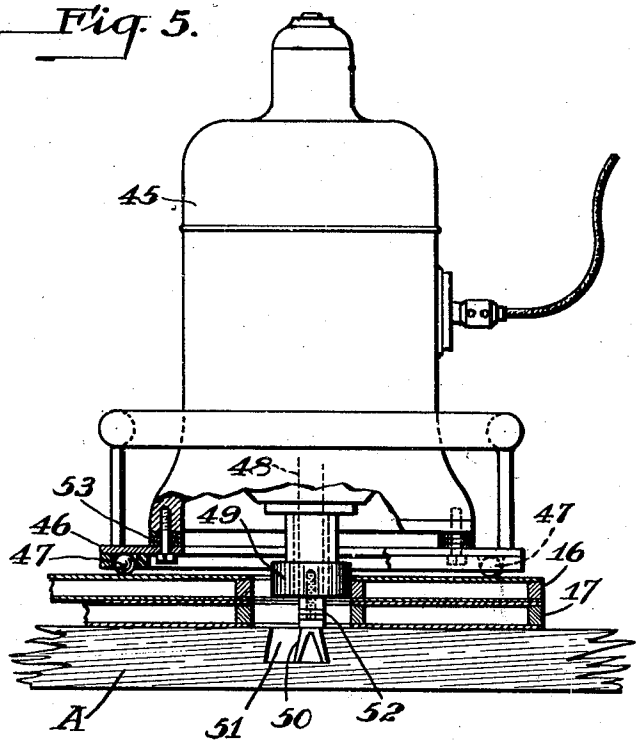
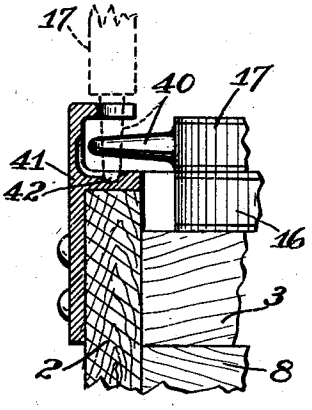


Fig. 6.



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Fig. 7.

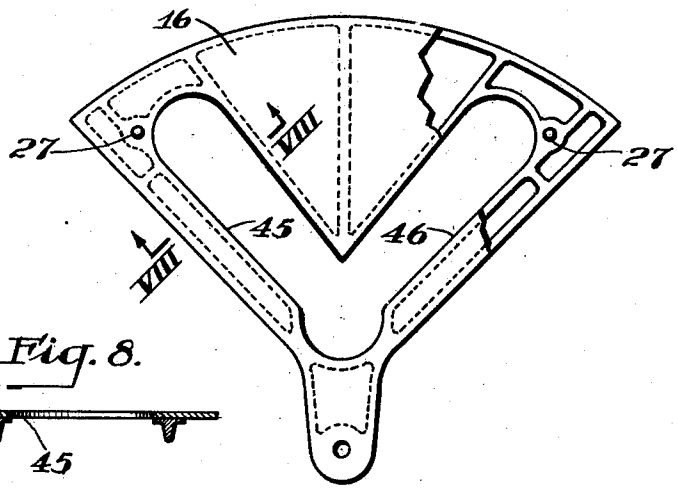


Fig. 8.

Fig. 9.

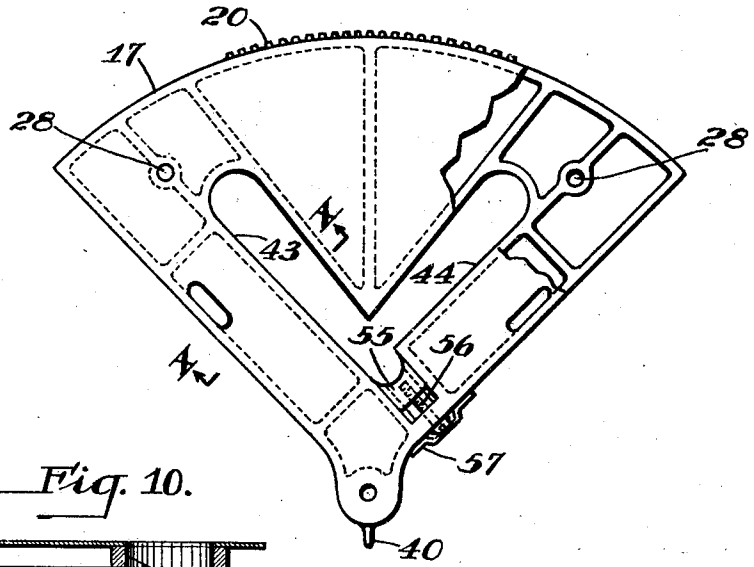
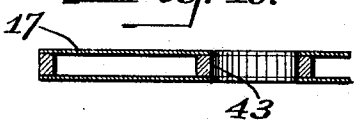


Fig. 10.



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1,751,816

UNITED STATES PATENT OFFICE

SAMUEL HUNTER, OF BELLEVUE, PENNSYLVANIA

ROUTING MACHINE

Application filed March 5, 1929. Serial No. 344,175.

The invention relates to stair routing machines and particularly to the means for supporting the work and for guiding the cutter during the operation of cutting out the grooves for receiving the treads and risers of the stairs. The invention has for its objects the provision of apparatus, (1) which can be operated with rapidity and precision, (2) which can be easily adjusted to varying requirements as to the proportions of the treads and risers, (3) which provides for regulating the depth of the throat or recess to receive the overhanging edge of the tread, (4) which can be reversed with a minimum expenditure of time and effort in order to cut both sets of grooves, (5) and which has improved means for clamping and positioning the stringer or board to be grooved preliminary to cutting each pair of tread and riser grooves. One embodiment of the invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a perspective view of the complete apparatus. Fig. 2 is a plan view. Figs. 3 and 4 are sections on the lines III—III and IV—IV, respectively of Fig. 2. Fig. 5 is an enlarged partial side elevation and partial section of the motor and cutting means carried thereby. Fig. 6 is an enlarged detail section. Fig. 7 is a plan view (with certain parts broken away) of the filler or spacing plate. Fig. 8 is a section on the line VIII—VIII of Fig. 7. Fig. 9 is a plan view (with certain parts broken away) of the templet plate. And Fig. 10 is a section on the line X—X of Fig. 9.

Referring to the drawings, 1 is the top or face plate of the machine, 2, 3, 4 and 5 are longitudinally extending frame members, and 6, 7, 8, 9 and 10 are cross frame members. Secured to the cross frame members 6 and 7 and 9 and 10 (Fig. 2) are the strips 11 and 12 and 13 and 14 carrying the rollers 15, 15, 15, 15, which form a runway supporting the stringer A which is to be routed or grooved. These rollers reduce the labor incident to sliding the stringer from one position to another in the body of the machine.

The plate has its central portion cut away in approximately a semi-circle, as indicated in Figs. 1 and 2 and over this space is adjustably mounted the segmental spacing or filler plate 16 and the templet plate 17 shown in detail in Figs. 7 and 9. The spacing plate 16 (which is the same thickness as the plate 1) fits snugly inside the arc 18 (Fig. 2) resting upon the shelf 19 (Figs. 2 and 4), while the templet plate 17 overlies the top of the plate 1 and is provided at its edge with a rack 20. This rack is engaged by a pinion 21 mounted on the shaft 22 (Fig. 4) operated by the handle 23. Both the filler or spacing plate and the templet plate are pivoted upon the same bolt 24 having a handle 24a (Figs. 2 and 4) extending through the sleeve 25 in the frame members 3 and 8 threaded into a nut 26 at its lower end. The frames of the plates 16 and 17 are preferably made of aluminum in skeleton form (Figs. 7 to 10) covered with thin sheet metal, which gives the necessary stiffness with a minimum of weight. The plate 16 is provided with pins 27, 27 fitting into the holes 28, 28 in the plate 17 when the templet plate is placed on the spacing plate; so that the two plates move as a unit when fitted together (Figs. 1 and 2). The plates are secured against movement on the plate 1 by means of a pair of clamps 29, 29 which slide through straps 30, 30 and have their ends bent so as to fit tightly over the edges of the templet plate when the clamps are driven in to the position shown in Figs. 1 and 2 by light blows of a hammer. Graduation marks 31 and 31a (Figs. 1 and 2) guide the operator in positioning the templet plate particularly after reversing it to cut the other stringer, as later described.

In order to clamp the stringer A against the bottom of the spacing plate during the cutting operation, the clamping block 32 (Figs. 2 and 4) is provided. This block is guided by a pin 33 mounted in a slot in the frame member 8 and also by a pair of downwardly projecting flanges 34 lying on either side of the frame member. The block is moved by a cam 36 pivoted on the pin 37 and operated by the handle 38. The pin 33 is inclined because the cam in its clamping movement tends to move the block 32 to the left (Fig. 4) as well as upward, which is

desirable, as it tends to press the stringer A to the left against the positioning strip 39.

As a convenience in reversing the templet plate 17, such member is provided with a pivot pin or nose 40 extending into the bracket 41 (Fig. 6), such bracket being provided with a recess 42 which is engaged by the nose as indicated in the dotted lines when the plate 17 is swung upward to disengage it from the plate 16 and give clearance for the turning movement, the bolt 24 being of course removed at such time.

The templet plate 17 is provided with a pair of guide slots 43 and 44 which come in opposition to the slots 45 and 46 in the spacing plate 16 when the parts are in assembled relation, the latter slots being wider and longer than the slots 43 and 44 in order to clear the cutting tool and guide roller (as later described) regardless of the reversal of the templet plate.

The cutting mechanism comprises the motor 45 and parts associated therewith shown in Fig. 5. Secured to the base of the motor is a plate 46 provided with a plurality of ball casters 47. The motor shaft 48 carries the roller 49 adapted to engage the sides of the templet grooves 43 and 44 and the usual cutter tool 50 having a threaded shank which is screwed into the end of the motor shaft. The depth of the groove 51 cut by the tool may be regulated by the use of the two sets of washers 52 and 53, the depth of the groove being increased by adding washers 52 or removing washers 53 and decreased by removing washers 52 or adding washers 53.

The depth of the recesses 54 (Figs. 1 and 2) at the ends of the tread grooves are regulated by the position of the block 55 (Fig. 9) at the end of the groove 43. This block is slidably mounted and may be moved in and out by the screw 56 which is threaded into the block. A pivoted keeper 57 holds the bolt against outward movement after the block is adjusted to proper position.

The position of the stringer A with respect to the templet grooves and consequently the length of such grooves is regulated by the positioning strip 39. This strip carries at its ends a pair of bolts having at their upper ends the thumb nuts 59. These bolts extend through slots 60, 60 in the plate 1. By this means an adjustment of the board is possible, the board being held in adjusted position by screwing down the thumb nuts 59. The board also serves another use as it is graduated, as indicated at 61, and the graduations act as a guide in moving the stringer A endwise after each pair of grooves is cut, a mark being placed on the stringer next to the scale.

The manipulation of the machine is as follows. The templet and spacing plates are adjusted to the proper angle by means of the pinion 21 and the plates clamped in position by driving in the members 29, 29. The stringer A to be grooved is then inserted on the rollers 15 beneath the plate 1 until its end is properly positioned to begin the cut, the positioning strip 39 also being positioned and clamped so as to hold the stringer at the position necessary to give grooves of the desired length. The stringer is now securely clamped in position against the bottom of the spacing plate 16 (Fig. 3) by operating the cam 32 so as to swing the block 32 upward against the stringer. The motor with its cutter is next placed on the templet plate with its cutter extending through one of the slots 43 and 44 and the grooves are cut in the stringer by moving the motor so that the roller 49 follows the templet grooves. The stringer must now be moved ahead to cut the next pair of grooves, and to permit this the cam handle 38 is pulled upward, thus relieving the stringer, which is then pushed forward, the scale 61 on the strip 39 serving as a guide as to the proper distance. This grooving operation is now repeated.

In order to groove the companion stringer which is to lie opposite the stringer A, the device must be reversed. To do this, the bolt 24 is removed, the clamps 29, 29 are released, and the plate 17 is lifted on its nose 40 to upright position (dotted lines in Fig. 6), turned through 180 degrees and replaced on top of the spacing plate 16. The bolt 24 is now replaced, and the two plates 16 and 19 are swung to the left (Fig. 2) until the right hand edge of the plate 17 occupies a position on the scale 31^a corresponding to the position previously occupied by the left hand edge of the plate on the scale 30, as indicated in Fig. 2. When the bolt 24 is tightened and the clamps 29, 29 driven in, the device is ready for operation as described in connection with the grooving of the stringer A.

It will be apparent that the apparatus can be operated with precision, that it is relatively compact and simple, and that it can quickly and easily be adjusted and manipulated to cut grooves of a wide variety of dimensions. The frame of the spacing plate 16 preferably has the ribs constituting said frame of the tapering cross section shown in Fig. 8 to provide better clearance for an escape of the shavings which drop into the slots 45 and 46.

What I claim is:

1. A stair routing device comprising a framework, a face plate thereon cut away to provide an opening bounded on one side by an arc of a circle, a segmental templet above the face plate pivoted adjacent the center of said arc and overlapping the curved edge of said opening, said templet being provided with guide slots, clamping means for holding the templet against the top of the face plate, a support for the stringer to be grooved extending beneath the face plate and templet,

a spacing or filler plate beneath the templet, also of segmental shape and pivoted concentric with the templet and provided with slots registering with those of the templet, and clamping means supported by the framework beneath the stringer and adapted to press it tightly against the spacing plate.

2. A stair routing device comprising a framework, a face plate thereon cut away to provide an opening bounded on one side by an arc of a circle, a segmental templet above the face plate pivoted adjacent the center of said arc and overlapping the curved edge of said opening, said templet being provided with guide slots, clamping means for holding the templet against the top of the face plate, a roller runway for the stringer to be grooved extending beneath the face plate and templet, a spacing or filler plate beneath the templet also of segmental shape and pivoted concentric with the templet and provided with slots registering with those of the templet, and clamping means supported by the framework beneath the stringer and adapted to press it tightly against the spacing plate.

3. A stair routing guide means comprising a face plate cut away to provide an opening, a templet having guide slots therethrough mounted on the face plate over the opening, a releasable pivotal connection between the templet and face plate, means for clamping the templet to the face plate, a pivot member projecting from the edge of the templet on the outer side of said pivotal connection, and a pivot socket mounted in fixed relation with respect to the face plate in position to engage said pivot member when the templet is swung to an upright position.

4. A stair routing guide means comprising a face plate cut away to provide an opening, a templet having guide slots therethrough mounted on the face plate over the opening, a releasable pivotal connection between the templet and face plate, means for clamping the templet to the face plate, a pivot pin projecting from the edge of the templet on the outer side of said pivotal connection, and a socket opening laterally and surrounding the end of said pivot pin, said socket being fixed with respect to the face plate and being adapted to engage said pivot pin when the templet is swung to upright position.

5. A stair routing guide means comprising a face plate cut away to provide an opening, a templet pivotally mounted on the face plate over the opening and provided with a pair of intersecting guide slots, a guideway extending beneath the face plate for supporting the stringer to be grooved, a positioning strip extending along the guideway for engaging the side of the stringer, and adjustable connections between the strip and face plate permitting such strip to be adjusted transversely of its length to fix the position of the stringer with respect to the templet.

6. A stair routing guide means comprising a face plate cut away to provide an opening, a templet pivotally mounted on the face plate over the opening and provided with a pair of intersecting guide slots, a guideway extending beneath the face plate for supporting the stringer to be grooved, a positioning strip extending along the guideway for engaging the side of the stringer, and adjustable connections between the strip and face plate permitting such strip to be adjusted transversely of its length to fix the position of the stringer with respect to the templet, said strip being provided with a scale extending longitudinally thereof.

7. A stair routing guide means comprising a face plate cut away to provide an opening, a templet pivotally mounted on the face plate over the opening and provided with a pair of intersecting guide slots, a guideway extending beneath the face plate for supporting the stringer to be grooved, a positioning strip extending along the guideway for engaging the side of the stringer, means for clamping the templet to the face plate in its various positions of adjustment, means for clamping the stringer in fixed relation with the face plate, and adjustable connections between the strip and face plate permitting such strip to be adjusted transversely of its length to fix the position of the stringer with respect to the templet.

In testimony whereof, I have hereunto subscribed my name this 28th day of February, 1929.

SAMUEL HUNTER.