(No Model.) 2 Sheets—Sheet 1.

W. GREAVES.

ROUTING MACHINE.

No. 483,671. Patented Oct. 4, 1892.

Fig. 1

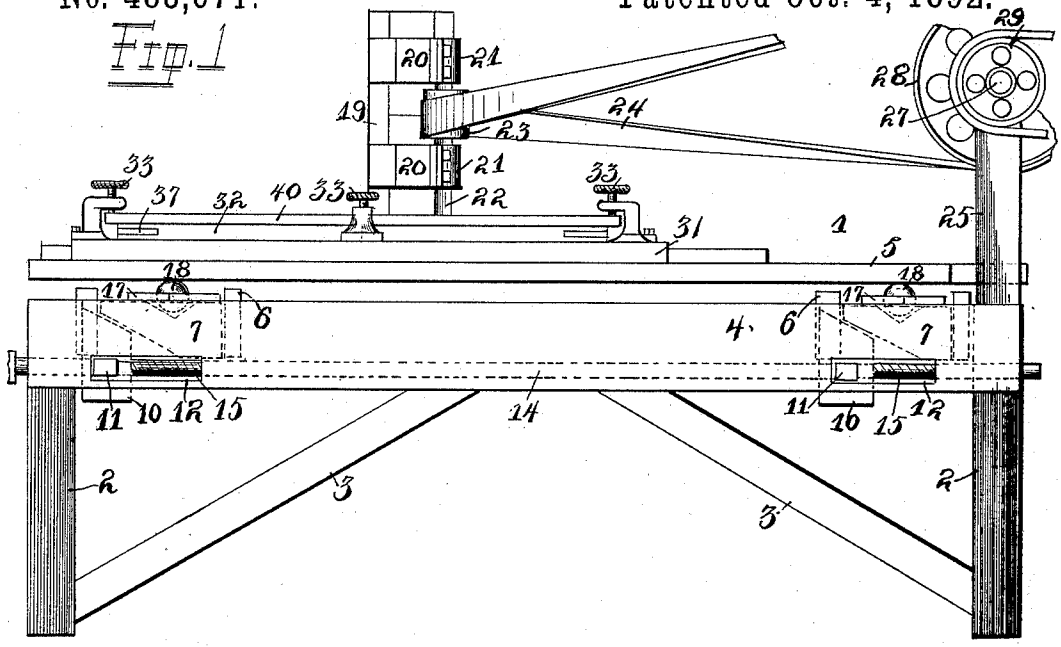


Fig. 2

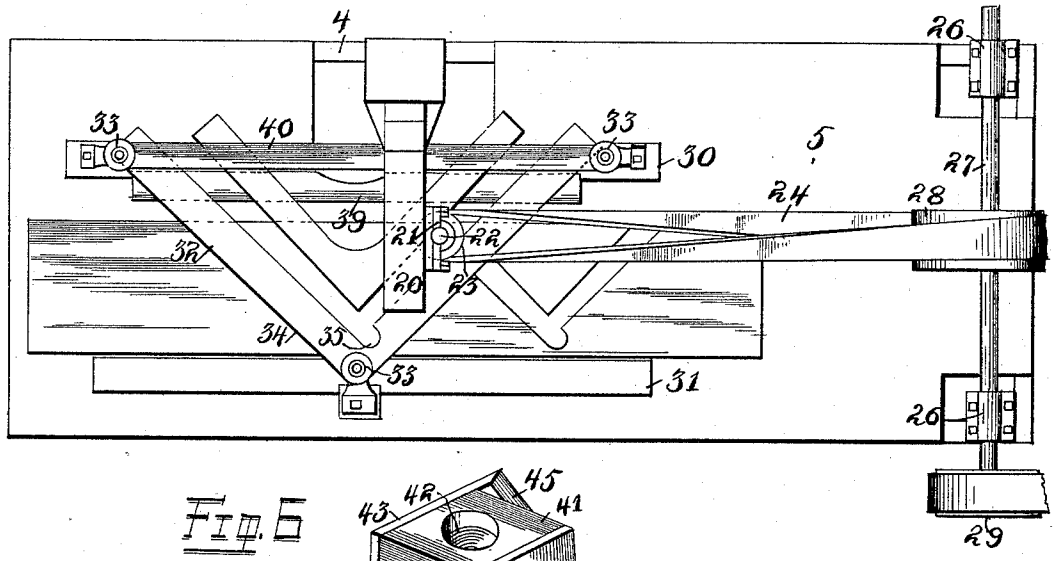
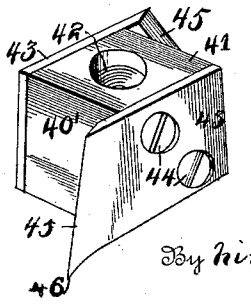


Fig. 6



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(No Model.) 2 Sheets—Sheet 2.

W. GREAVES.

ROUTING MACHINE.

No. 483,671. Patented Oct. 4, 1892.

Fig. 3

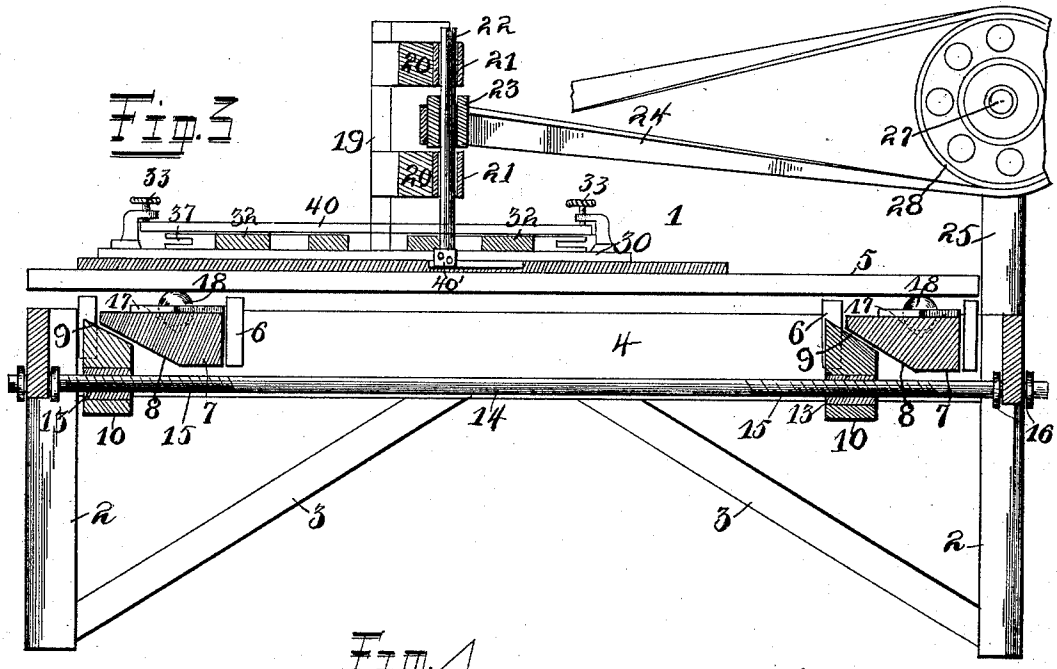


Fig. 4

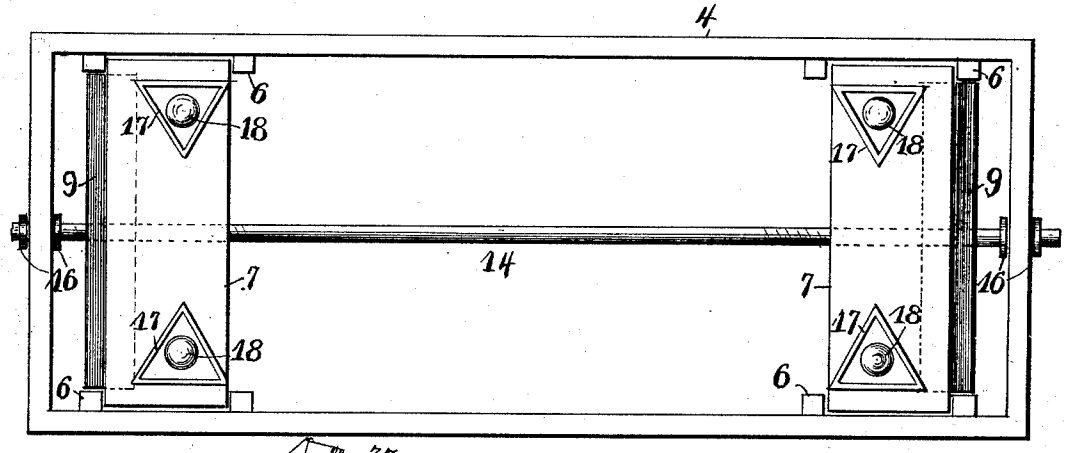
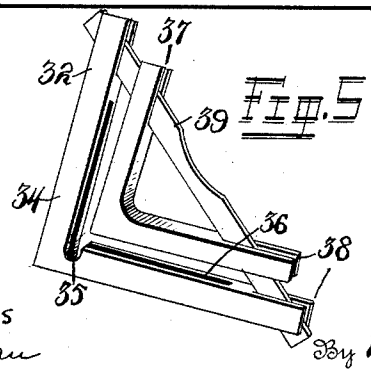


Fig. 5



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UNITED STATES PATENT OFFICE.

WILLIAM GREAVES, OF ST. LOUIS, MISSOURI, ASSIGNOR TO CHARLES GREAVES, OF SAME PLACE.

ROUTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 483,671, dated October 4, 1892.

Application filed January 16, 1892. Serial No. 418,264. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM GREAVES, of the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Routing-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to improvements in routing-machines; and it consists in the novel arrangement and combination of parts, as will be more fully hereinafter described, and designated in the claims.

In the drawings, Figure 1 is a side elevation of my complete invention. Fig. 2 is a top plan view of the same. Fig. 3 is a vertical longitudinal section taken through the machine. Fig. 4 is a top plan view of the lower portion of the machine having the bed and upper portion of said machine removed therefrom. Fig. 5 is a perspective view of the gage which I employ in carrying out my invention, and Fig. 6 is a perspective view of a bit constructed according to my invention.

The object of my invention is to provide a simple and improved machine for forming the triangular-shaped grooves formed in suitable boards which compose partially a staircase, which grooves receive the edges of the remaining parts—namely, the riser and the tread boards, which complete said staircase when properly united.

It will be readily understood that in order to guide the material properly under the revolving bit I employ a suitable gage, which conforms to the shape of the grooves to be cut, thereby guiding the material in its proper direction and cutting the grooves in the proper dimensions.

Referring to the drawings, 1 represents a table, which receives the entire weight of the machine, and to which the stationary and movable parts are attached. Said table is composed of four legs 2, and leading from said legs to the bottom of the said table are attached suitable strengthening-bars 3, whereby the said table is made more rigid. The said table is composed, also, of four sides 4, which are secured to the legs 2 in any suitable and mechanical manner.

5 represents the bed of the machine, and in order to make the same movable and allow the material to be worked to be fed under the bit I employ the mechanism, as I shall now proceed to describe.

6 represents vertically-arranged guide-blocks, which are secured to the interior surfaces of the sides 4 of the table, between which the transverse pieces 7 are adapted to be elevated and guided, holding said transverse piece in its proper location with the table 1. The transverse piece 7 is provided with an inclined surface 8, which rests upon the inclined surface 9, formed upon a second transverse piece 10. When the transverse pieces are in the position, as shown in Fig. 3, the movable bed 5 of the machine is in its lowest position, and in order to elevate the said bed the blocks 10 are moved in the proper direction, causing the inclined surfaces on both transverse pieces to slide upon one another by the mechanism, as hereinafter described. The transverse pieces 10 are provided with extensions 11, which extensions project through suitable slots 12, formed in the sides 4 of the table, by means of which the said pieces are held in a horizontal position and prevented from turning. When the said transverse pieces 10 are operated in the proper direction, the said extensions will slide in the said slots made for their reception, premising, however, that said slots are of sufficient length to admit movement. The transverse pieces 10 are provided with horizontal openings about their median portions, and within said openings are secured two internally-screw-threaded thimbles or collars 13.

14 represents a longitudinal shaft, the ends of which are supported in suitable bearings placed in the ends of the table 1, and said shaft is provided with external screw-threads 15, which screw-threads correspond with the screw-threads formed in the said collars 13.

Around the said shaft and secured to the same on each side of the end pieces of the table 1 are collars 16, which prevent the shaft 14 from longitudinal movement and yet allow the said shaft to be operated by hand or other power. When the shaft 14 is turned in the proper direction, the blocks 10 will be moved, causing the inclined surfaces formed upon the same to come in contact with the inclined

surfaces formed upon the transverse piece 7, elevating the said last-named pieces, and consequently elevating the bed 5 of the table to any desired adjustment.

17 represents triangular-shaped boxes, which are secured to the upper surface of the transverse pieces 7, within which movable balls 18 are placed, and upon which balls the bed 5 of the table is adapted to rest, thereby providing a bed that can be moved in any direction, which is absolutely necessary for this particular work.

To the rear of the table 1 is secured an upright post 19, and attached to said post are two projecting supports 20, which are adapted to support bearings 21, to which said bearings are secured.

22 represents a vertical shaft, which is adapted to rotate in said bearings 21 and be held by the same. Keyed to the shaft 22 and between the supports 20 is a belt-pulley 23, around which a drive-belt 24 is adapted to run, thereby imparting motion to the said shaft.

25 represents two vertical supports, which are secured at one end of the table 1 and at their upper ends provided with bearings 26.

27 represents a horizontal shaft, which is mounted in said bearings 26, and keyed to said shaft between the supports 25 is a large belt-wheel 28, around which the belt 24 passes. Upon one end of the shaft 27 is secured a small belt-pulley 29, and around said pulley a belt is adapted to pass for imparting motion to the shaft 27. The power applied to the last-named belt may be of any suitable kind.

30 represents a strip, which is secured to the top of the bed 5, and 31 a similar strip, which is also secured to the said bed and parallel with the first-named strip, the said strips being of sufficient thickness to enable the wood to be worked upon to freely pass under the guide. The strip 31 acts as a guide, against which the wood to be worked is placed, and also against which the said work is adapted to slide when a new cut is desired to be made. Upon the upper surface of the said strips 30 and 31 the guide 32 of the machine is adapted to be clamped.

33 represent clamps, two of which are secured to the strip 30 and one to the strip 31 for clamping said gage firmly to the said strips and in a rigid position. The gage 32 is placed in the position as shown in Fig. 2 of drawings and the material to be worked upon allowed to slide or be passed under the same, premising, however, that said material to be worked is held firmly to the bed of the table while one cut is being made or a cut scribed by the guide.

34 represents the square portion of the gage, the inner surface of which is provided with a cut-away portion 35, which portion forms a nosing at the uniting portion of the grooves formed in the material, premising, however, that the said shaft 22 is to permit the bit to follow the outline of said square, including the cut-away portion 35 of said square. The surface of the square which comes in contact with the shaft 22 is provided with a metallic lining 36, in order to prevent the shaft 22 from wearing the square proper.

37 represents that portion of the square which forms a gage for the width of the groove to be worked in the material placed upon the bed 5.

In order to hold the two parts 34 and 37 of the gage in their proper adjustment, I provide the said portions with grooves 38 at their ends, and within said grooves is placed a flat strip 39, the thickness of which corresponds to the width of the slots formed in the said parts of the gage.

When the gage is in the position as shown in Fig. 5 of the drawings, with the parts properly united and the space between the two parts of the said gage properly adjusted, the entire gage as seen in said figure is placed upon the strips 30 and 31 of the table and clamped in said position by an additional strip 40, which strip is clamped upon the ends of the gage by means of the clamps carried by the said strips 30.

40′ represents a bit which is especially constructed for the purpose, and is secured to the lower end of the shaft 22 below the gage and adapted to be brought in contact with the material to be worked.

41 represents a square block which is provided with a screw-threaded bore 42, which bore is adapted to receive the screw-threaded end of the shaft 22 for holding said block rigidly to the said shaft. To the opposite sides of the said block 41 are secured two cutters 43, the cutting-edges of which project in an opposite direction, and said cutters secured to the said block by screws 44. By attaching the cutters to the block 21, as above described, the same can be at any time disconnected from said block and sharpened with but very little inconvenience.

45 represents the cutting-edges of the cutters 43, which are formed at an angle, in order that when the said cutter or bit is revolved it will cut from the bottom and thereby make a smooth and finished appearance upon the material after proper grooves have been cut therein. The said cutters 43 are each provided with sharp extensions 46, formed on the lower edge of the same and adjacent to the cutting-edges 45 of the said cutters, whereby the bit is started into the material when the shaft 22 is revolved.

It will be readily understood that the material to be worked upon is suitably marked off by means of a pattern before the same is fed under the cutter, or I may provide a suitable gage upon the strip 31, by means of which it can be ascertained at an instant the position of the next grooves and the distance the material is to be moved in order to make said cut.

I do not limit myself to the precise construction of the parts, as shown, or to the par-

ticular construction of the devices for imparting motion to the machine, as the same may be modified without departing from the nature of my invention.

Having fully described my invention, what I claim is—

1. In a routing-machine, the combination, with a vertically and horizontally adjustable bed and a bit rotating above the same, of a gage comprising a square, and an auxiliary square adjustable to or from the same for regulating the intervening space, and means for clamping said squares upon the bed, substantially as and for the purpose set forth.

2. In a routing-machine, the combination, with a vertically and horizontally adjustable bed provided with two parallel guide-strips and a fixed bit rotating above said bed, of a gage consisting of a square, an auxiliary square adjustable to or from the same, said squares being provided at their ends with slots, and a strip passing through the latter, and clamps for binding the gage upon the strips carried by the bed, substantially as and for the purpose set forth.

3. As an improvement in routing-machines, a gage composed of a square, such as 34, a portion, such as 37, adapted to be moved to and from said square for adjusting the space between the two, and a strip, such as 39, passed through suitable grooves formed in the ends of said portions for holding the said parts in their proper position and location to one another, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM GREAVES.

Witnesses:

C. K. JONES,

ALFRED A. EICKS.