

A. G. OSMER.
ROUTING MACHINE.
APPLICATION FILED JAN. 20, 1912.

1,027,063.

Patented May 21, 1912.

2 SHEETS-SHEET 1.

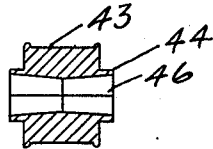
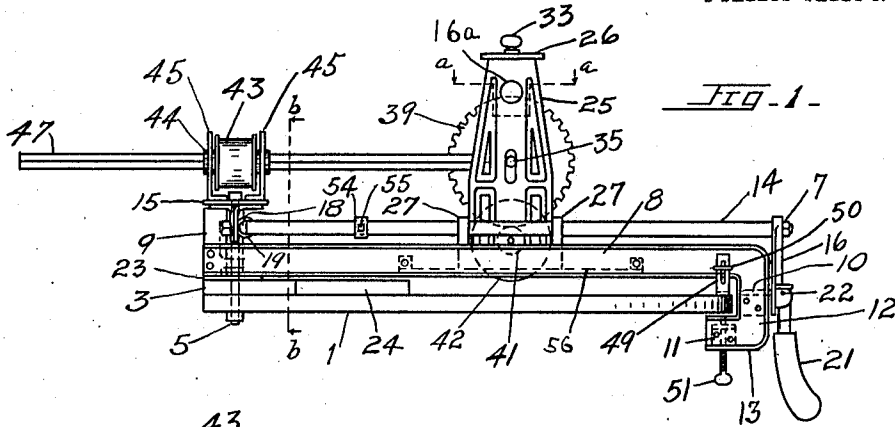


Fig. 3.

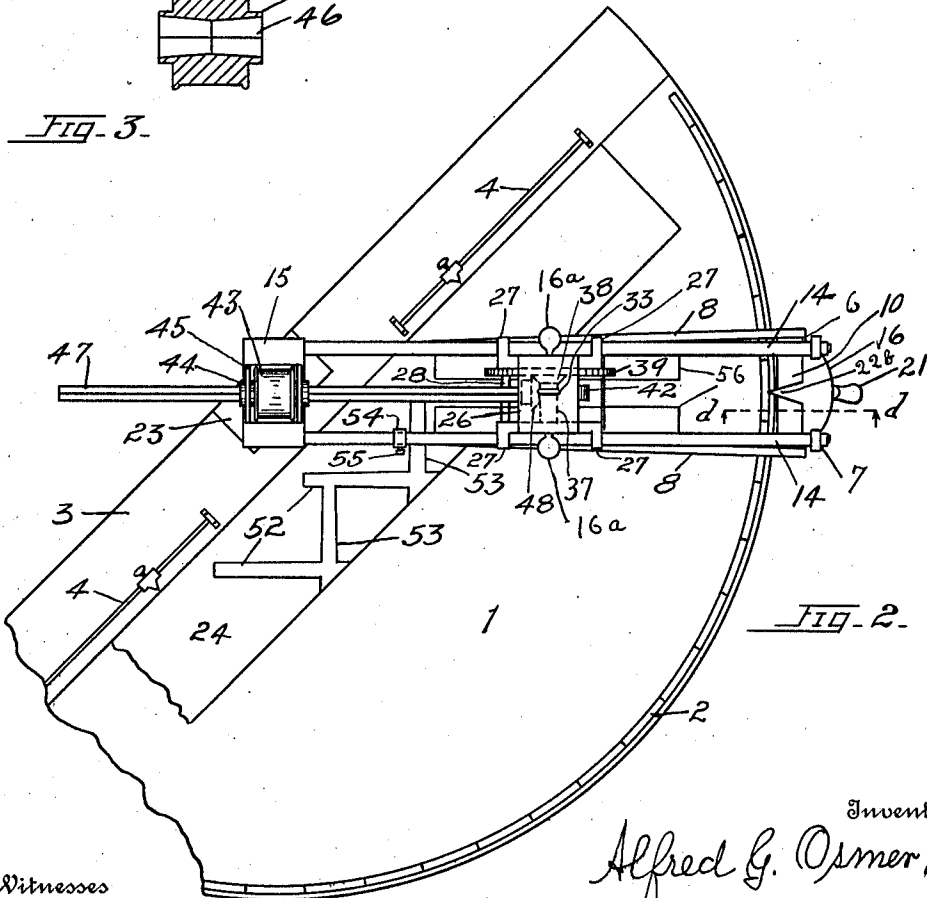


Fig. 2.

Witnesses

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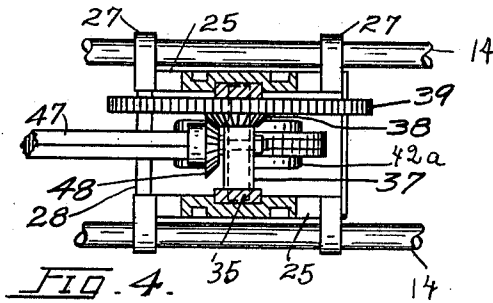


FIG. 4.

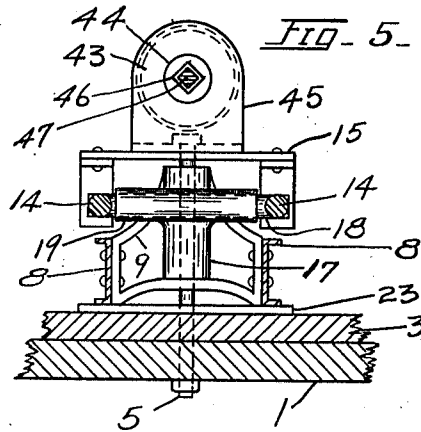


FIG. 5.

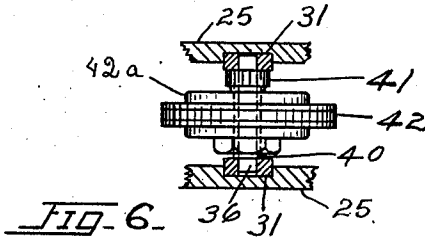


FIG. 6.

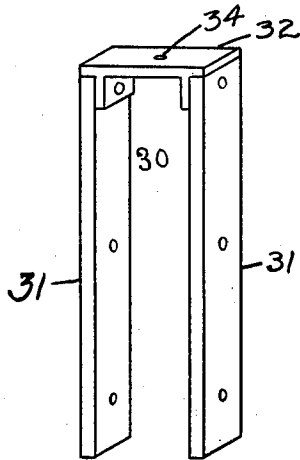


FIG. 7.

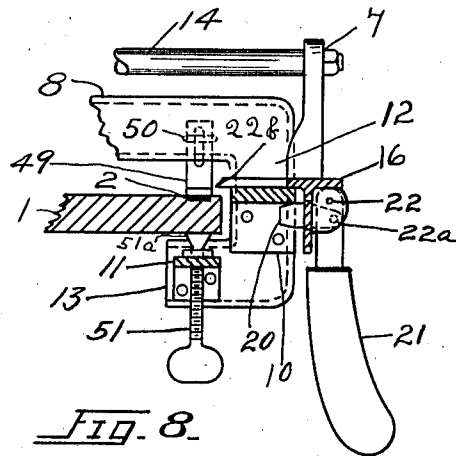


FIG. 8.

Witnesses

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ALFRED G. OSMER, OF LINCOLN, NEBRASKA.

ROUTING-MACHINE.

1,027,063.

Specification of Letters Patent.

Patented May 21, 1912.

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To all whom it may concern:

Be it known that I, ALFRED G. OSMER, of the city of Lincoln, county of Lancaster, and State of Nebraska, have invented certain new and useful Improvements in Routing-Machines, which improvements are described in the following specification and are illustrated by the accompanying drawings.

The invention relates to dadoing and routing machines of that class in which a power-driven rotary cutter is mounted on a carriage traveling on a pivoted horizontal track supported over a work table.

It is the object of the invention to facilitate the transmission of power from the driving pulley of such a machine to the cutter so mounted; to render that transmission positive and uniform in all positions of the carriage relatively to the pulley and to the work as well as in all positions of the cutter relatively to the carriage; to facilitate making slight angular adjustments of the pivoted track, in addition to its extensive adjustments of that kind, for the purpose of cutting grooves of varying or tapering width, as in stair stringers and the like; to dispense with all use of belting between the driving pulley and the cutter; to render smooth and free from raggedness the sides of the grooves or channels produced by the cutter; and in general to produce a superior machine of the specified class. To this end I mount the pivoted track for the carriage of the machine upon a jib, or pivoted arm, extended radially over the work table; connect the driving pulley, mounted on the pivotal end of the carriage track, with the cutter by gearing that comprises an angular shaft teetering and sliding lengthwise in an axial hole through the pulley; and mount the cutterhead upon a horizontal axis.

The best manner in which I have contemplated applying the principles of the invention, is shown in said drawings; yet the invention itself is not restricted to any specific arrangement or construction of parts, excepting such limitations of that kind as are either expressed or necessarily implied in the subjoined claims.

In these drawings the Figures 1 and 2 are respectively a side elevation and a plan of a routing machine constructed in accordance with these principles and including a stair stringer in position for routing therein.

Fig. 3 is an axial section of the driving pulley. Fig. 4 is a horizontal section of the carriage etc. on the section line *a-a* of Fig. 1. Fig. 5 is a vertical cross section on the section line *b-b* of Fig. 1. Fig. 6 is a horizontal section of the carriage and its contents on the axial line of the cutterhead. Fig. 7 is a detail in perspective. Fig. 8 is a vertical section on the section line *d-d* of Fig. 2.

In this illustrative machine the numeral 1 denotes a stationary semicircular work table having a marginal graduated scale 2, a transverse stop board 3 against which the work is to be held edge to edge on that table, and gages 4 adjustable on the stop board. At the geometric center of this semicircular table is fixed the vertical pivot bolt 5, on which are terminally pivoted both the horizontal jib 6 and the carriage track 7. This jib is a rigid quadrangular frame, comprising the two approximately parallel side bars 8 and the crosspieces 9, 10 and 11, located respectively at the inner or pivotal end of the jib, at the outer descending portion 12 of the jib, and at the returning end 13 of the same under the table. The pivoted carriage track 7 is a rigid rectangular frame, similarly comprising two parallel side rails 14, which are of uniform cross section, and two terminal crosspieces 15 and 16; the crosspiece 15 at the inner end of the track being perforated to accommodate the vertical bolt 5, and the crosspiece 16 at the outer end of the track overlapping the jib crosspiece 10, and being adapted to slide thereon as the track is swung from side to side of the jib. The jib 6 and the track 7 are flexibly joined together by the pivot bolt 5, working in a vertically sleeved portion 17 of the crosspiece 9, and by the hinge pin 18, seated in the dependent ends of the crosspiece 15 and working in the horizontally sleeved portion 19 of the same crosspiece 9. For the purpose of swinging the track on the jib, the handles 16^a are mounted on the carriage. For the purpose of holding the track in fixed positions of angular adjustment on the jib, a wedge 20, working through a slot in the crosspiece 16, is operated by the pivoted hand-lever 21, turning on the pivot pin 22, and fastened to the wedge by the pivot pin 22^a, to engage and to disengage the crosspiece 10 of the jib as may be required. To facilitate the angular adjustment of the jib on the work table,

a pointer 22^b carried on the outer end of the jib, travels over the graduated scale 2.

The carriage of the machine comprises a pair of standards, or vertical side pieces, 25, which are united at the top by the horizontal cross-plate 26 and at the bottom by the cross bolt 28, and are provided with the supporting lugs 27 perforated to contain and slide on the track rails 14. Between the side pieces 25, and vertically movable in parallel grooves therein, is seated a slide 30, which is shown separately in Fig. 7. This slide comprises two vertical bars 31 united at the top by a horizontal cross-plate 32, and is adjustable vertically in the carriage by the thumbscrew 33 working in the screw hole 34 and in an alining screw hole in the cross plate 26. In this slide are fixed two horizontal shafts, namely, the gearing shaft 35 and the cutter shaft 36. On shaft 35 is placed the sleeve 37 carrying the bevel gear 38 and the spur gear 39, revolving in unison; and on shaft 36 is placed a sleeve 40 carrying both the spur gear 41, which meshes with the gear 39, and also the rotary cutter head 42. The double-flanged pulley 43, having the hubs 44 and journaled thereby in the vertical bearing pieces 45 on the top of the crosspiece 15, has a horizontal axial perforation 46, square in cross section and increasing uniformly in size from the middle to each end, as shown in Fig. 3. The square rod 47, carrying the terminal bevel gear 48 meshing with the gear 38, slides longitudinally in this aperture 46 as the carriage slides on the track rails 14, and also accommodates itself to the vertical adjustment of the gear 38 effected by the adjustment of the slide 30 by the thumbscrew 33. To fasten the free end of the jib to the table in working positions of angular adjustment, the margin of the table is clamped between the traveler 51^a on the end of the setscrew 51, working in the cross-piece 11, and the supporting feet 49 which are vertically adjustable on the jib rails 8 by the thumbscrews 50.

To limit the inward, or centripetal travel, of the carriage on the track rails 14, and thereby to stop at a uniform predetermined point in a piece of work 24 the cutting of the successive parallel grooves 52 or 53, a sliding sleeve stop 54 is placed on one of the rails 14 in the path of one of the lugs 27, and is adjusted on that rail by the setscrew 55 from time to time as the differing work may require. To indicate in advance to the eye of the operator, looking down on the work from above, the exact location of the extreme secondary or widening cuts which may be positioned in the work by the angular adjustment of the track on the jib, two straight guides 56 are bolted to the side rails 8 in positions registering respectively with the margins of those cuts. By

reason of its pivotal position the pulley 43 is conveniently driven by an overhead pulley, not shown in the drawings, and by a connecting belt, without the aid of any device for taking up slack of the latter.

In the operation of the machine, the work is clamped or otherwise fastened on the work table and against the stop board, in the position indicated, by any suitable means, not shown in the drawings, and in that position is adjusted endwise with reference to the gages 4 for cutting the parallel grooves in succession. By a first cutting these grooves are made severally of a uniform width, dependent on the length of the cutterhead; and by a second cutting are widened and tapered at an angle dependent upon the angular adjustment of the track on the jib. The cutters are raised into an accessible position, as often as desired, by tilting the track 7 through a considerable angle on its pivot 18; and cutter heads of different dimensions may be substituted for each other on the shaft 36, as the work may render desirable.

I claim as my invention:

1. A routing machine, comprising a work table, a jib pivoted thereto to swing horizontally over the table, a track similarly pivoted to the jib, a carriage traveling on the track, a rotary cutter head supported by the carriage, and means for driving the cutterhead.

2. A routing machine, comprising a work table, a jib pivoted thereto to swing horizontally over the table, a track similarly pivoted to the jib, a carriage movable on the track, a pulley mounted on the track, a shaft sliding in the pulley, gearing mounted in the carriage and driven by the shaft, and a rotary cutterhead driven by the gearing.

3. A machine of the specified class, comprising a work table, a carriage track, and a jib supporting the track; the jib being pivoted to swing laterally over the table, and the track being hinged to oscillate both laterally and vertically on the jib, in combination with means for fastening the jib rigidly to the table and to the track.

4. A routing machine, comprising a work table having a graduated scale, a pivoted jib swinging horizontally over the table and carrying a pointer along the graduated scale, a track pivoted to the jib, a carriage movable on the track, a pulley mounted on the track, gearing mounted in the carriage, an operative connection between the pulley and the gearing, and a cutter driven by the gearing.

5. A routing machine, comprising a work table, a jib terminally pivoted thereto swinging horizontally over the table and provided with a clamp for engaging the same, a track pivoted to oscillate sidewise on the jib, a carriage moving on the track, a

pulley mounted on the track, gearing mounted in the carriage, a driving connection between the pulley and the gearing, and a cutter driven by the gearing.

5 6. A routing machine, comprising a work table, a jib pivoted to swing horizontally over the table, a track pivoted to oscillate sidewise on the jib and to oscillate up and down thereon, a carriage movable on the track, a pulley mounted on the track, gearing mounted in the carriage, a driving connection between the gearing and the pulley, and a cutter driven by the gearing.

10 7. A routing machine, comprising a work table, a jib pivoted to swing horizontally over the table, a track pivoted to oscillate both vertically and sidewise on the jib, a carriage reciprocable on the track, a pulley mounted on the track, gearing mounted in the carriage, a driving connection from the pulley to the gearing, and a rotary cutter driven by the gearing.

15 8. A routing machine, comprising a work table, a jib pivoted thereto to swing horizontally over the table, a track carried by the jib and pivoted to oscillate horizontally thereon, a carriage movable on the track, a slide in the carriage, means for moving the slide up and down in the carriage, gearing mounted in the slide, a cutter driven by the gearing, a driving pulley mounted on the jib, and a driving connection between the pulley and the gearing.

20 9. A routing machine, comprising a work table, a jib pivoted to swing horizontally thereon, a track pivoted to the jib to oscillate both vertically and horizontally thereon, a carriage on the track, gearing mounted in the carriage, a cutter driven by the gearing, a pulley mounted on the jib and having a square axial perforation larger at the ends than in the middle, in combination with a square gearshaft working in the perforation.

25 10. A routing machine, comprising a work table, a jib pivoted to swing horizontally over the table, a track pivoted to swing both vertically and horizontally on the jib, a carriage movable on the track, gearing mounted in the carriage, a cutter driven by the gearing, a pulley mounted on the jib and having a square axial perforation larger at the end than in the middle, in combina-

tion with a square gearshaft working in the perforation.

55 11. A routing machine, comprising a work table, a laterally swinging jib pivoted to the table, a laterally swinging track pivoted to the jib, a carriage on the track, gearing mounted in the carriage, a cutterhead 60 revoluble on a horizontal axis and driven by the gearing, a pulley mounted on the jib, and a driving connection between the pulley and the gearing.

12. A routing machine comprising a 65 work table, a jib pivoted to swing horizontally thereon, means for fastening the jib in different angular positions on the table, a track pivoted to oscillate horizontally on the jib, means for fastening the 70 track in different angular positions on the jib, a carriage movable on the track, a pulley mounted on the track, gearing mounted in the carriage, means for raising and lowering the gearing in the carriage, a driving 75 connection between the pulley and the gearing, and a cutter driven by the gearing.

13. A routing machine, comprising a work table, a jib pivoted to swing horizontally over the table, and provided with 80 a clamp for engaging the same, a track pivoted to swing horizontally on the jib, and provided with a clamp for engaging the same, a carriage moving on the track, a pulley mounted on the track, gearing mounted 85 in the carriage, a driving connection between the gearing and the pulley, and a cutter driven by the gearing.

14. A machine of the specified class, comprising a work table, a jib pivoted to 90 swing horizontally over the table, a track pivoted to oscillate horizontally on the jib, a carriage movable on the track, a rotary cutter traveling with the carriage, and means for driving the cutter, in combination with 95 visible guides carried by the pivoted jib and registering with different paths of the cutter in the work in different pivotal positions of the track relative to the jib.

In testimony whereof I hereunto set my 100 name in the presence of two witnesses.

ALFRED G. OSMER.

Witnesses:

WILLARD EDDY,
EVA CAYLEY.