No. 698,705. Patented Apr. 29, 1902.

H. A. HOLT.

TONGUING AND GROOVING MACHINE.

(Application filed Nov. 1, 1901.)

(No Model.) 5 Sheets—Sheet 1.

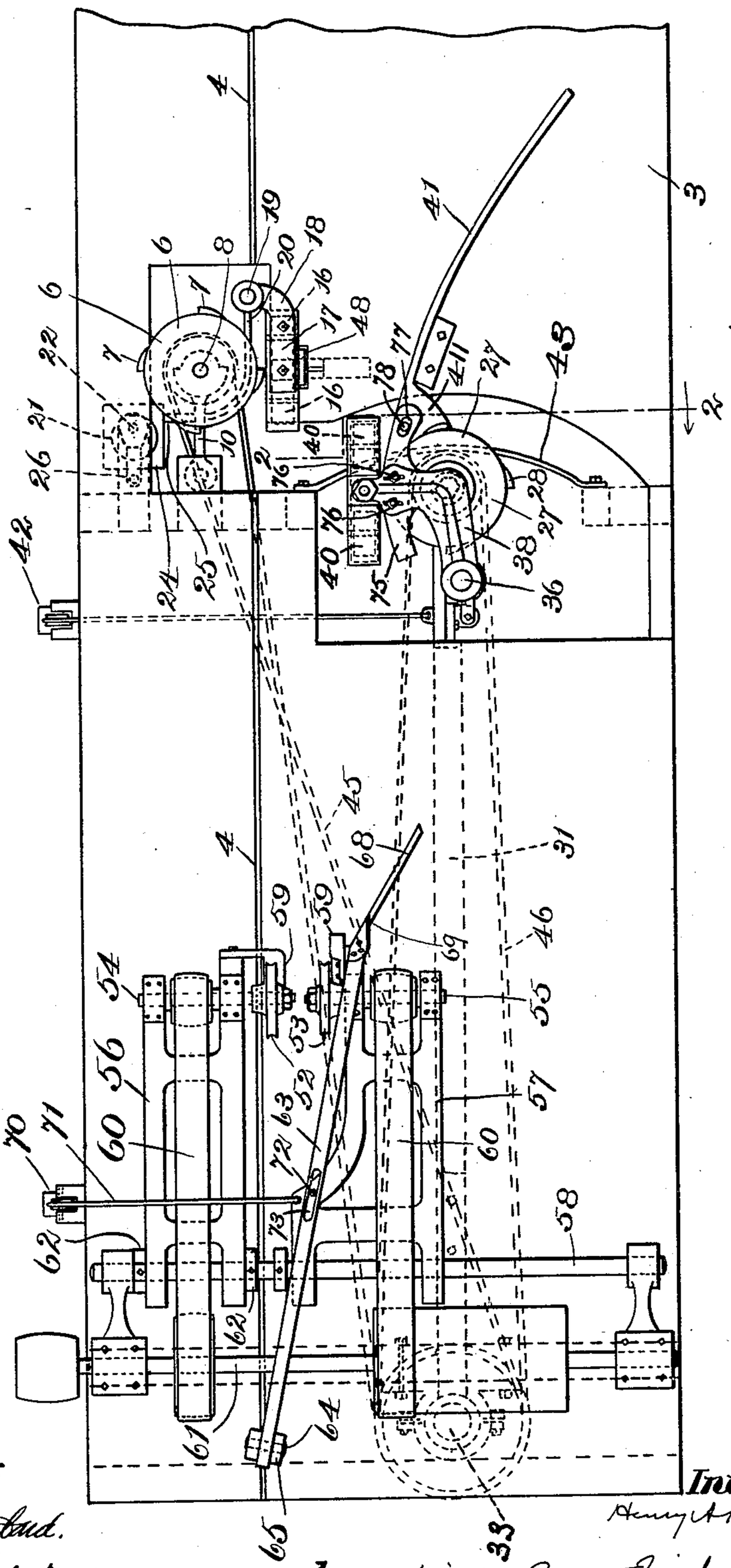

Fig. 1.

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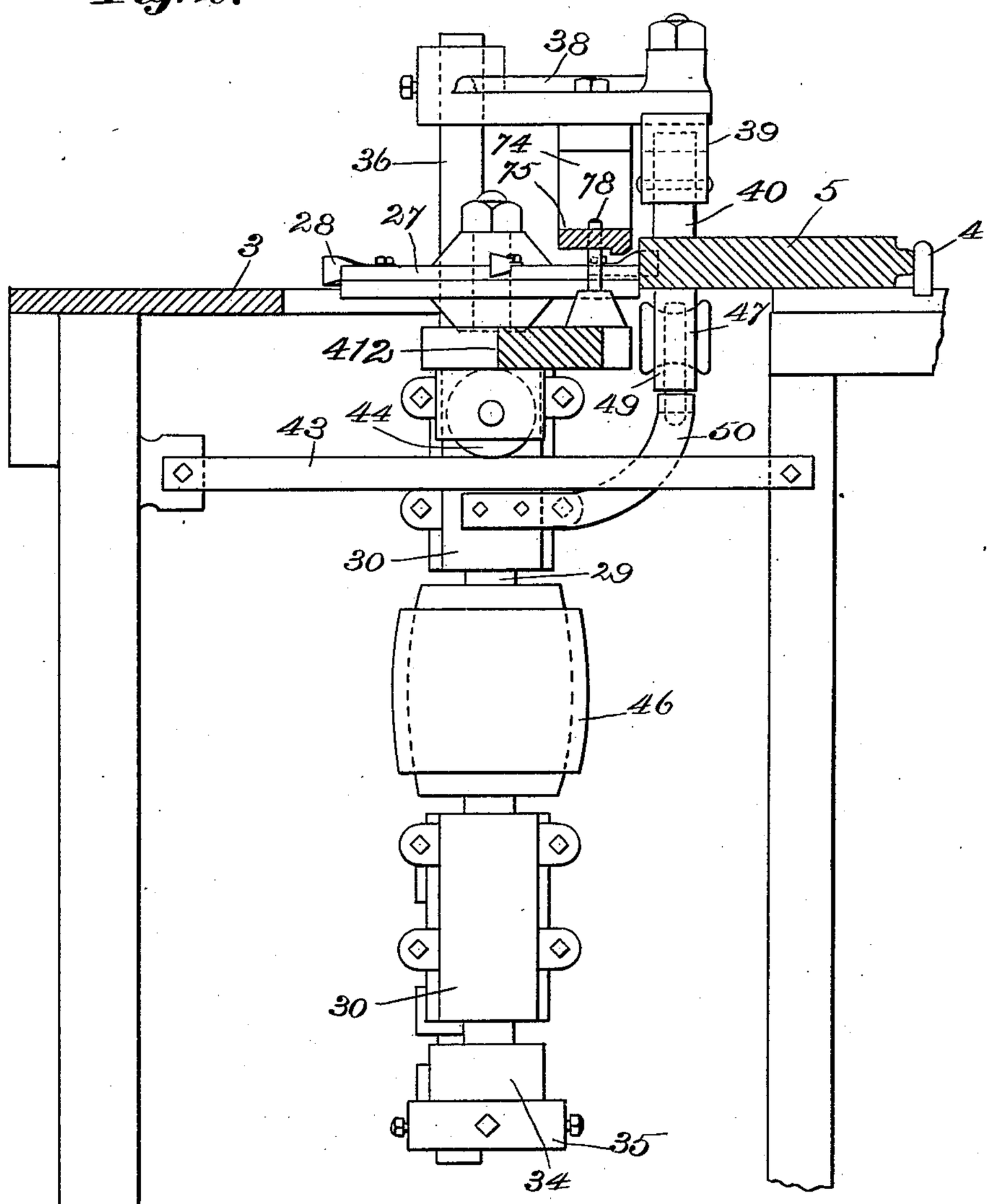
(No Model.) 5 Sheets—Sheet 2.

Fig. 2.



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(No Model.) 5 Sheets—Sheet 3.

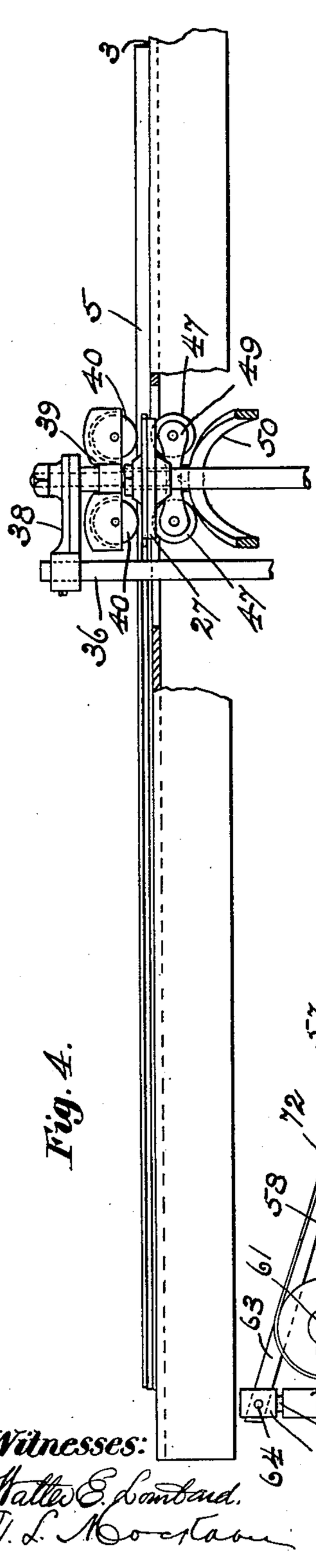

Fig. 4.

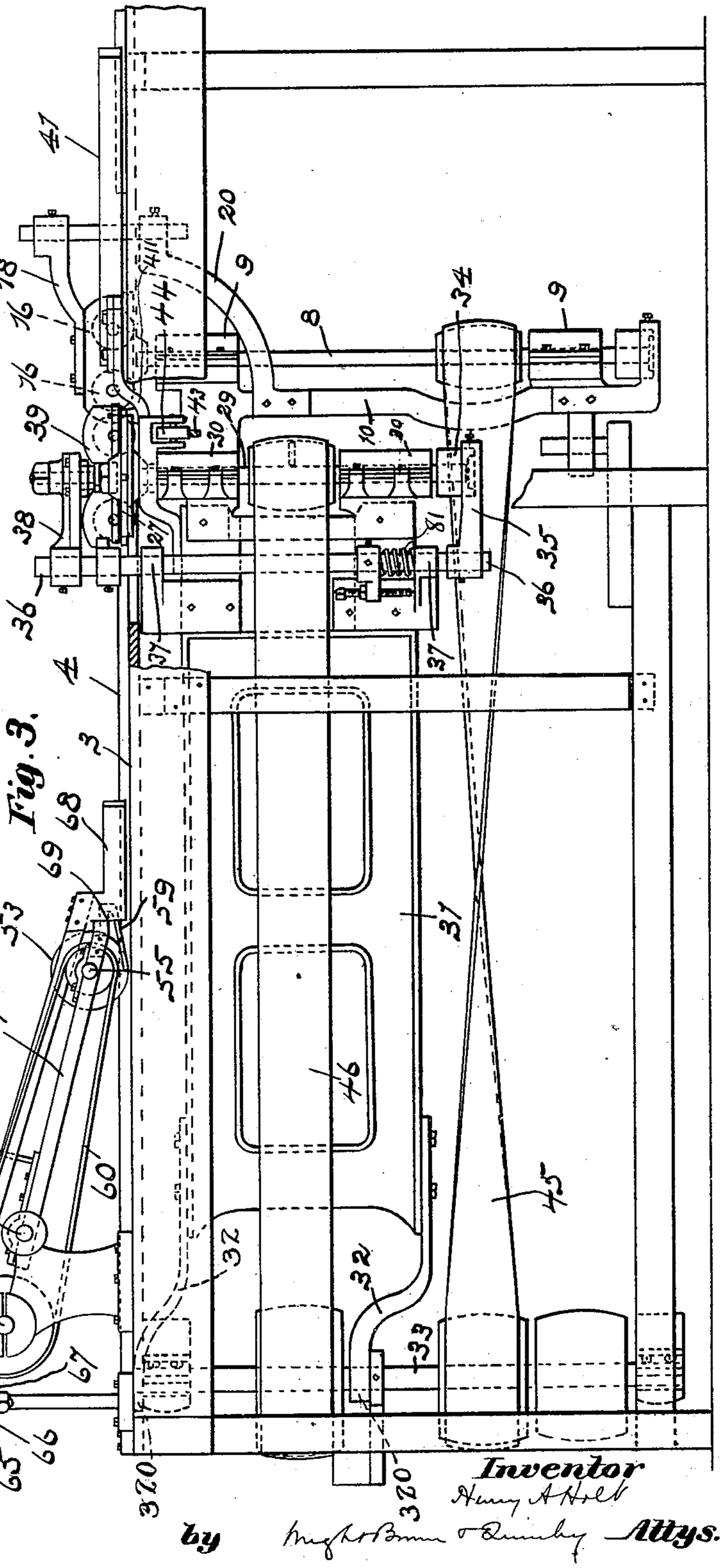

Fig. 3.

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TONGUING AND GROOVING MACHINE.

(Application filed Nov. 1, 1901.)

(No Model.) 5 Sheets—Sheet 4.

Fig. 5

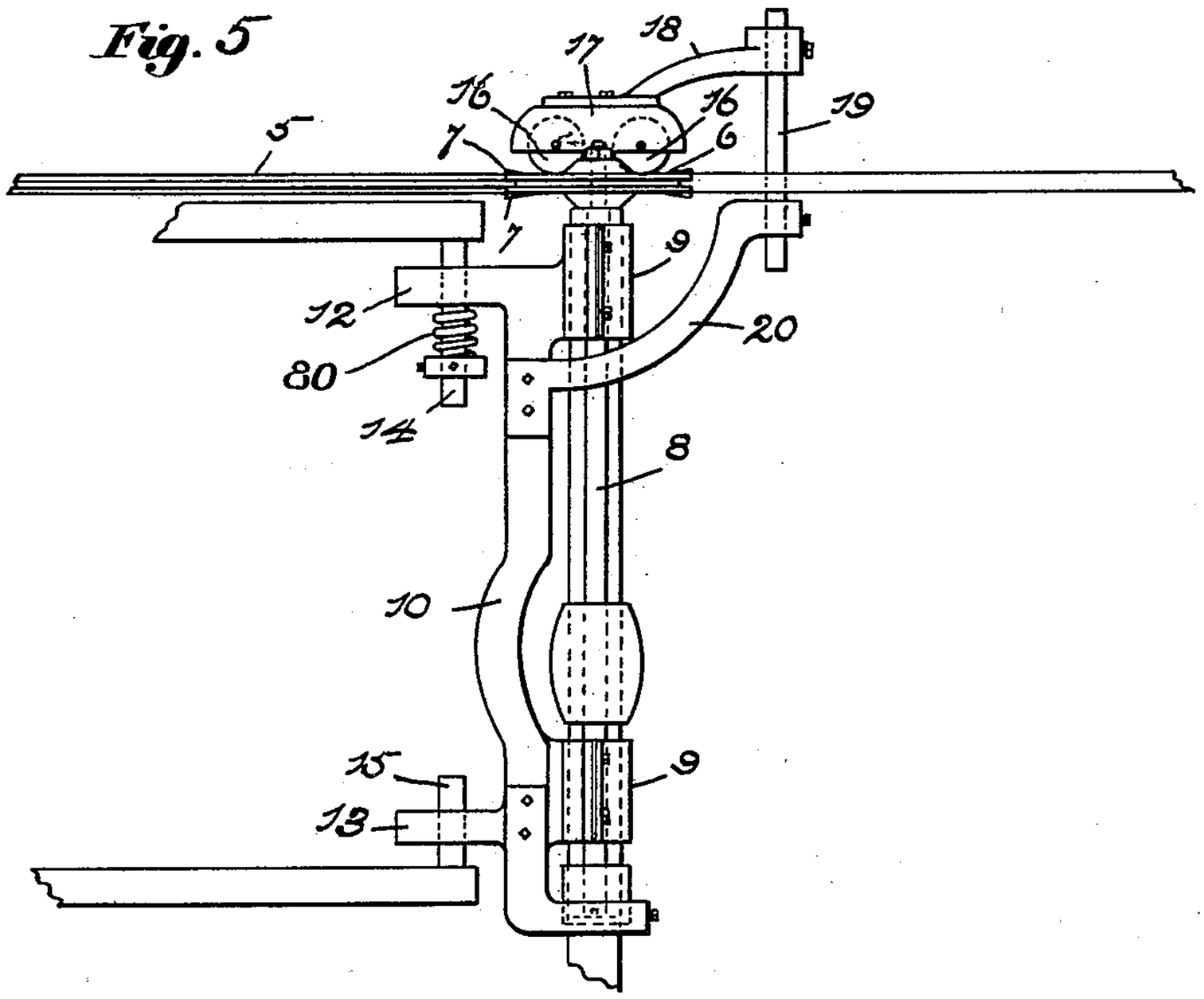
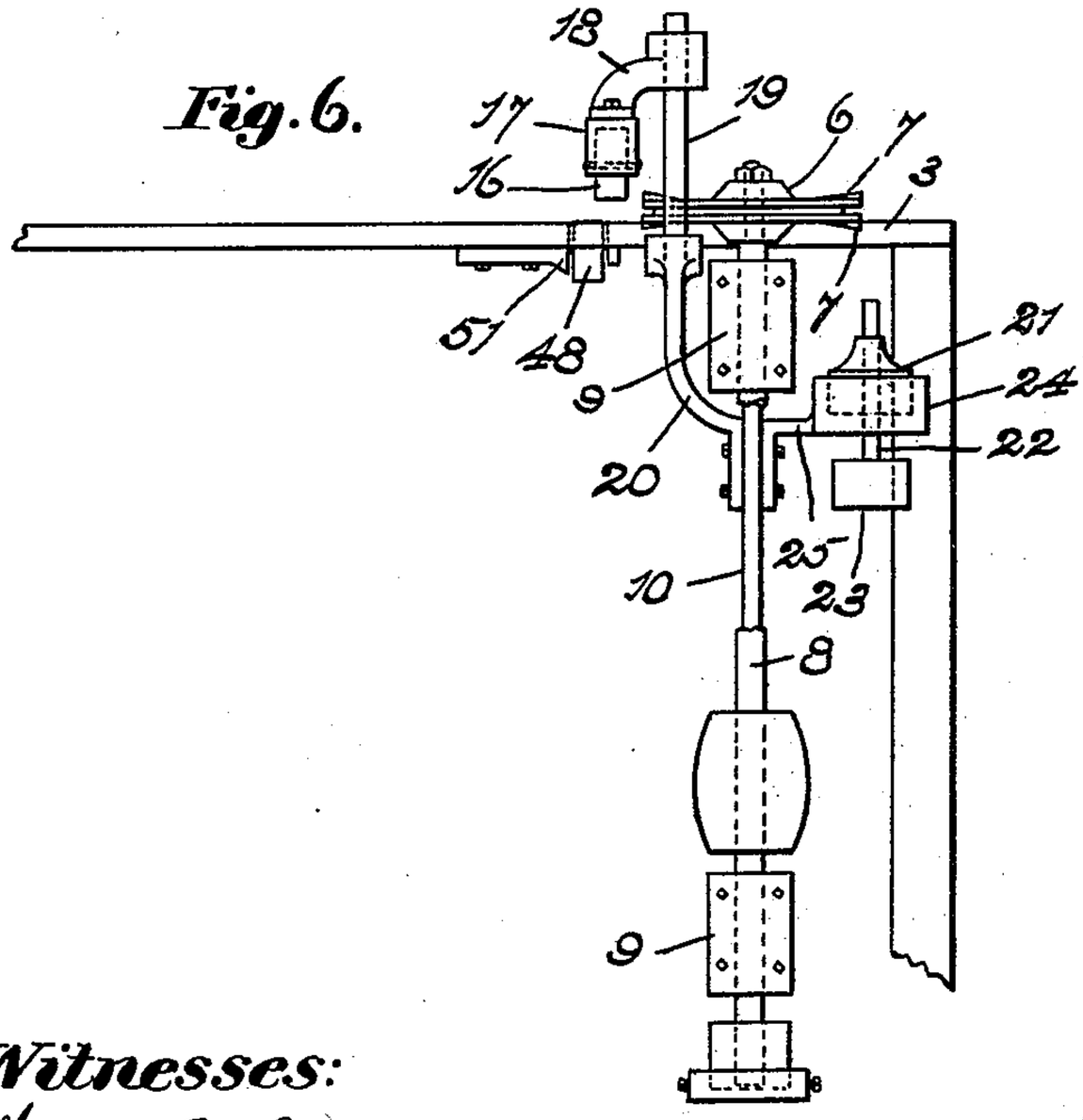


Fig. 6.



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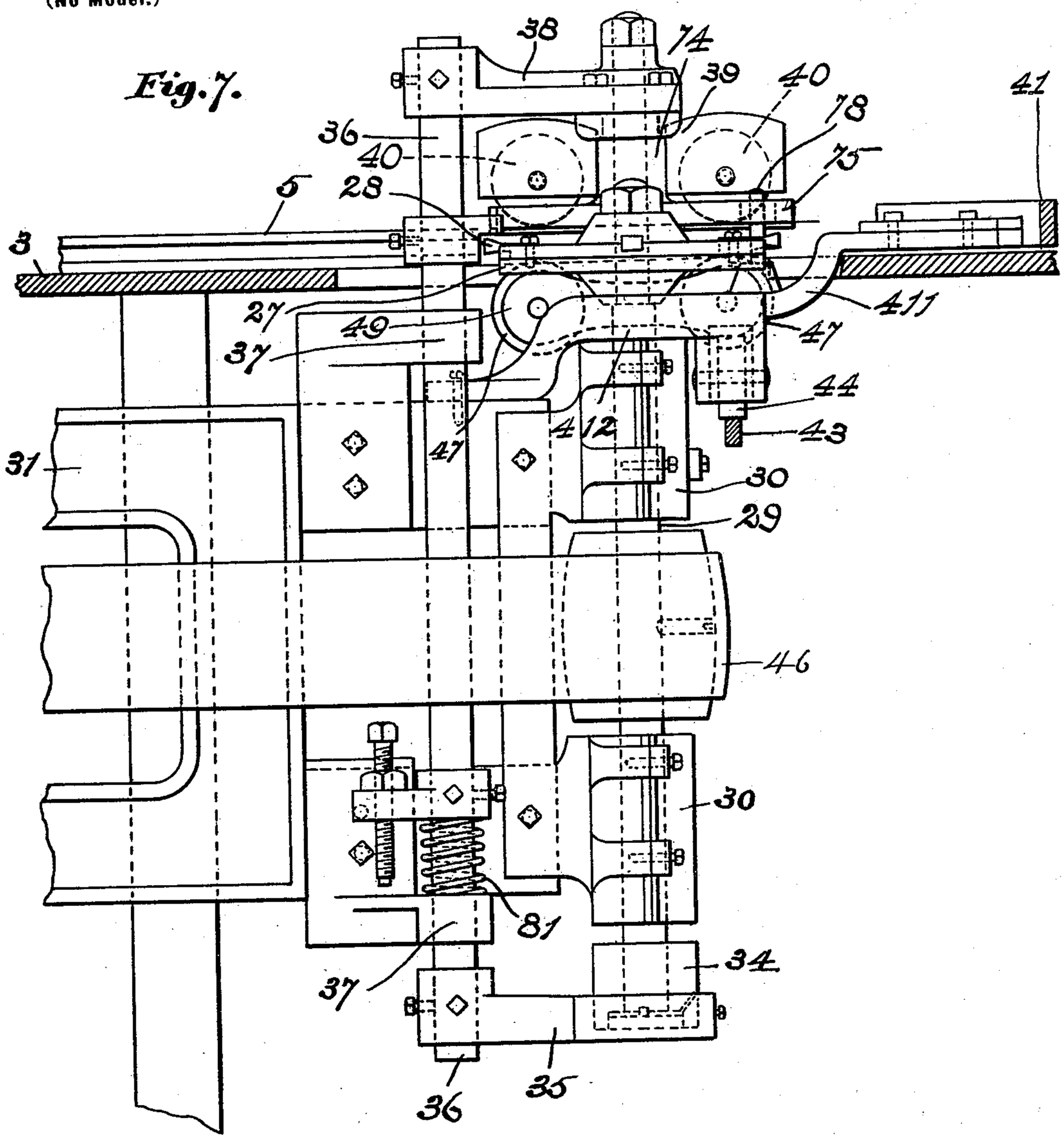
(No Model.) 5 Sheets—Sheet 5.

Fig. 7.



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UNITED STATES PATENT OFFICE.

HENRY A. HOLT, OF WILTON, NEW HAMPSHIRE.

TONGUING-AND-GROOVING MACHINE.

SPECIFICATION forming part of Letters Patent No. 698,705, dated April 29, 1902.

Application filed November 1, 1901. Serial No. 80,760. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. HOLT, of Wilton, in the county of Hillsboro and State of New Hampshire, have invented certain new and useful Improvements in Tonguing-and-Grooving Machines, of which the following is a specification.

This invention relates to machines for tonguing and grooving the edges of boards; and it has for its chief object to enable the tongues and grooves to be formed in exact parallelism with the sides of the board, whether said sides are flat or warped and without applying straightening-pressure to the board in case its sides are warped.

The invention also has for its object to provide certain improved means for beading the upper surface of the board.

The invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a top plan view of a machine embodying my invention. Fig. 2 represents a section on line 2 2 of Fig. 1. Fig. 3 represents a side elevation of the machine, a portion of the supporting-frame being broken away. Fig. 4 represents a side elevation showing parts of Fig. 3. Figs. 5 and 6 are elevations of the tonguing cutter-head and its supporting and adjusting mechanism. Fig. 7 represents a side elevation of a portion of Fig. 3 on a larger scale.

The same reference characters indicate the same parts in all the figures.

In the drawings, 3 represents the bed or table of the machine, having a guiding-rib 4, against which one edge of the board 5 bears during the operation.

6 represents the tonguing cutter-head, having tongue-forming cutters 7 and arranged to present said cutters to the edge of the board, which bears against the guide 4. The cutter-head 6 is affixed to a vertical shaft 8, which is journaled in bearings 9 9. Said bearings are affixed to a bar 10, having ears 12 13, Fig. 5, which are movable vertically on fixed vertical studs 14 15 on the frame of the machine, the shaft 8 and cutter-head 6 being thus rendered vertically movable.

With the bar 10 is connected a rider, consisting of rolls 16 16, a holder 17, in which said rolls are journaled an arm 18, affixed to the holder, a vertical stud 19, affixed to the arm 18 and extending through the table, and an arm 20, affixed to the stud 19 and to the bar 10. The rolls 16 bear on the upper surface of the board, and through the intermediate parts connecting them with the bar 10 hold said bar and the cutter-head at a height determined by the upper surface of the board. The bar 10 is adapted to swing horizontally on the studs 14 15 to adjust the cutter-head horizontally and is held at the desired adjustment by means of an eccentric 21, Figs. 1 and 6, affixed to a vertical stud 22, which is journaled in a fixed step or bearing 23 on the frame, and a strap or socket 24, embracing the eccentric and rigidly connected by an arm 25 with the bar 10. The eccentric 21 has a handle 26, by which it may be turned to impart the desired horizontal adjustment to the cutter-head 6, the eccentric and strap holding the cutter-head at any position to which it may be adjusted.

27 represents a cutter-head having grooved cutters 28 and affixed to a shaft 29, which is journaled in bearings 30 30, affixed to the swinging end of a frame 31, the other end of which has ears 32 32, Fig. 3, mounted to turn on bearings 320, surrounding a vertical shaft 33, the grooving cutter-head being thus adapted to swing horizontally to any extent required to adapt it to the width of the board being treated.

The shaft 29 is vertically movable in its bearings 30 to permit the height of the grooving cutter-head to be varied. The lower end of said shaft rests on a step 34, supported by an arm 35, affixed to a vertical stud 36, which is adapted to slide vertically in guides 37 on the swinging frame 31. To the upper end of the stud 36 is affixed an arm 38, having at its outer end a holder 39, in which are journaled rider-rolls 40 40, arranged to bear on the upper side of the board near the edge acted on by the cutters 28. The height of the cutter-head 27 is therefore determined by the upper surface of the board.

41 represents a finger connected by an arm 411 with an arm 412, affixed to the swinging end of the frame 31. The finger 41 projects over the table 3 and is obliquely arranged and located in position to be encountered by

the advancing end of a board which is being presented to the cutters. Said finger and the fixed guide 4 form a tapering throat, which receives the advancing end of the board. The frame 31 is yieldingly held by a weight 42, with the cutter-head 27 at its point of closest approach to the guide 4, the distance between the cutter-head and guide being less than the width of the narrowest board to be treated. One corner of the advancing end of the board striking the oblique finger 41 forces the cutter-head 27 away from the guide a distance determined by the width of the board, the grooving cutter-head being thus automatically adjusted to the width of the board. The swinging end of the frame 31 is supported by a segmental track 43, affixed to the supporting-frame, the swinging frame having a roller 44, supported by the arm 412 and bearing on said track.

The cutter-heads are rotated by belts 45 46, running on pulleys affixed to the shaft 33 to pulleys on the shafts 8 and 29, carrying said cutter-heads.

Suitable antifriction-rolls 47 47 and 48 are arranged to project slightly above the upper surface of the table and support the under side of the board. The rolls 47 47 are journaled in a holder 49, connected by an arm 50 with the swinging frame 31. The roll 48 is journaled in a holder 51, affixed to the table.

52 53 represent beading-cutters adapted to form beads on the upper surface of the board. Said cutters are affixed to horizontal shafts 54 55, which are journaled in bearings on the swinging ends of frames 56 57, whose inner ends are mounted to swing on a horizontal pivot-rod 58, the cutters being thus rendered vertically adjustable. The said frames are provided with shoes 59, which bear on the upper side of the board and determine the depth of cut of the beading-cutters. The cutters are rotated by belts 60, running on pulleys on a shaft 61 and on pulleys on the cutter-shafts 54 55.

The beading-cutter 52 is held in close proximity to the guide 4, so that it makes a bead in the board close to its tongued edge, the frame 56 being confined against lateral movement on the pivot-rod 58 by fixed collars 62 62. The frame 57 is movable laterally on said rod to adjust the cutter 53 toward or from the cutter 52. The cutter 53 is caused to form its bead at the center of the width of the board, whatever the width may be, by a proportioning-lever 63, which is pivoted at 64 to a holder 65, which is connected by a vertical pivot 66 with a fixed support 67, the pivot 66 being in line with the guide 4. The swinging end of the lever 63 has an offset oblique finger 68, the inner end 69 of which forms a shoulder which bears against one edge of the board and is held there by a weight 70, suspended by a cord 71, which is affixed to the laterally-movable frame 57. The lever 63 is engaged with the frame 57 by a pin 72 on said frame and a slot 73 in the lever receiving the pin. The pin 72 is located half-way between the shoulder 69 and the pivoted inner end of the lever. When the end of the advancing board reaches the oblique finger 68, it swings the lever 63 away from the guide 4 until the outer edge of the board bears against the shoulder 69. It will be seen, therefore, that the lateral movement imparted to the shoulder of the proportioning-lever by the entrance of the board between it and the guide 4 is twice that imparted by the lever to the frame 57 and cutter 53. Hence the said cutter is always held in a uniform relation to both edges of the board whatever the width of the board may be.

75 represents an edge gage having a shank 74, Figs. 2 and 7, which is secured by bolts 76 to the arm 38. Said gage is formed to bear on the outer edge of the board and limit the depth of entrance of the grooving-cutters into the board. The gage is preferably adjustable to permit the depth of the groove to be adjusted.

77 represents a slot in the gage 75, and 78 a stud affixed to the arm 411 and projecting upwardly into the slot to prevent the gage 75 and the arm 38 from swinging horizontally on the stud 36.

It will be seen that control of the height of the cutter-heads 6 and 27 by the upper surface of the board enables the tongues and grooves to follow any curvature in the said surface caused by warping, so that the tongues and grooves are made exactly parallel with the sides of the board regardless of any warp or twist therein.

The means described for laterally adjusting and holding the tonguing cutter-head 6 are intended chiefly to enable the said cutter-head to be displaced, so that it will not act on the board when it is desired to groove and not tongue the board. When the tonguing-cutter is thus displaced, the beading-cutters may also be displaced, so that they will not act on the board.

80, Fig. 5, and 81, Fig. 7, are springs which yieldingly support the cutter-heads 6 and 27 when there is no board under the riders.

My invention is not limited to the details of mechanism here shown, and the same may be variously modified without departing from the spirit of my invention.

Having thus explained the nature of my invention and described a way of constructing and using the same, although without having attempted to set forth all the forms in which it may be embodied or all the modes of its use, I declare that what I claim is—

1. In a machine of the character specified, a work-supporting table, a cutter-head, a shaft therefor, a vertically-movable support for said shaft and cutter-head, whereby the cutter-head may be adjusted vertically, and a rider connected with the shaft-support and arranged to be supported by the upper sur-

face of a board on said table, whereby the height of the cutter-head is determined by the upper surface of the board.

2. In a machine of the character specified, a work-supporting table having a fixed edge guide, a swinging frame pivoted below the table, a cutter-head having a shaft journaled in bearings on the swinging end of the frame and movable toward and from the said guide, said shaft being vertically movable, a rider arranged to bear on the top surface of a board, and connections between the rider and shaft, whereby the height of the cutter-head is determined by the upper surface of the board.

3. A machine of the character specified, comprising a work-supporting table having a fixed edge guide, two cutter-heads, a horizontally-movable support for the bearings of one cutter-head yieldingly pressed toward said guide, vertically-movable supports for the shafts of the two cutter-heads, riders arranged to bear on the top surface of a board, and connections between said riders and the shaft-supports, whereby the height of the cutter-heads is determined by the upper surface of the board.

4. A machine of the character specified, comprising a work-supporting table having a fixed edge guide, a vertically-movable beading-cutter held against lateral movement and located over said table, a vertically and horizontally movable cutter located over the table and movable toward and from the guide, and a proportional adjusting device actuated by the width of a board to adjust the horizontally-movable cutter.

5. A machine of the character specified, comprising a work-supporting table having a fixed edge guide, two pivoted frames located over the table and movable toward and from the same, one frame being horizontally movable and the other confined against horizontal movement, a proportional adjusting-lever pivoted at one end to the table and having at the other end a board-engaging shoulder, the lever being engaged at an intermediate point with the horizontally-movable frame.

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

HENRY A. HOLT.

Witnesses:
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CHAS. G. MARTIN.