

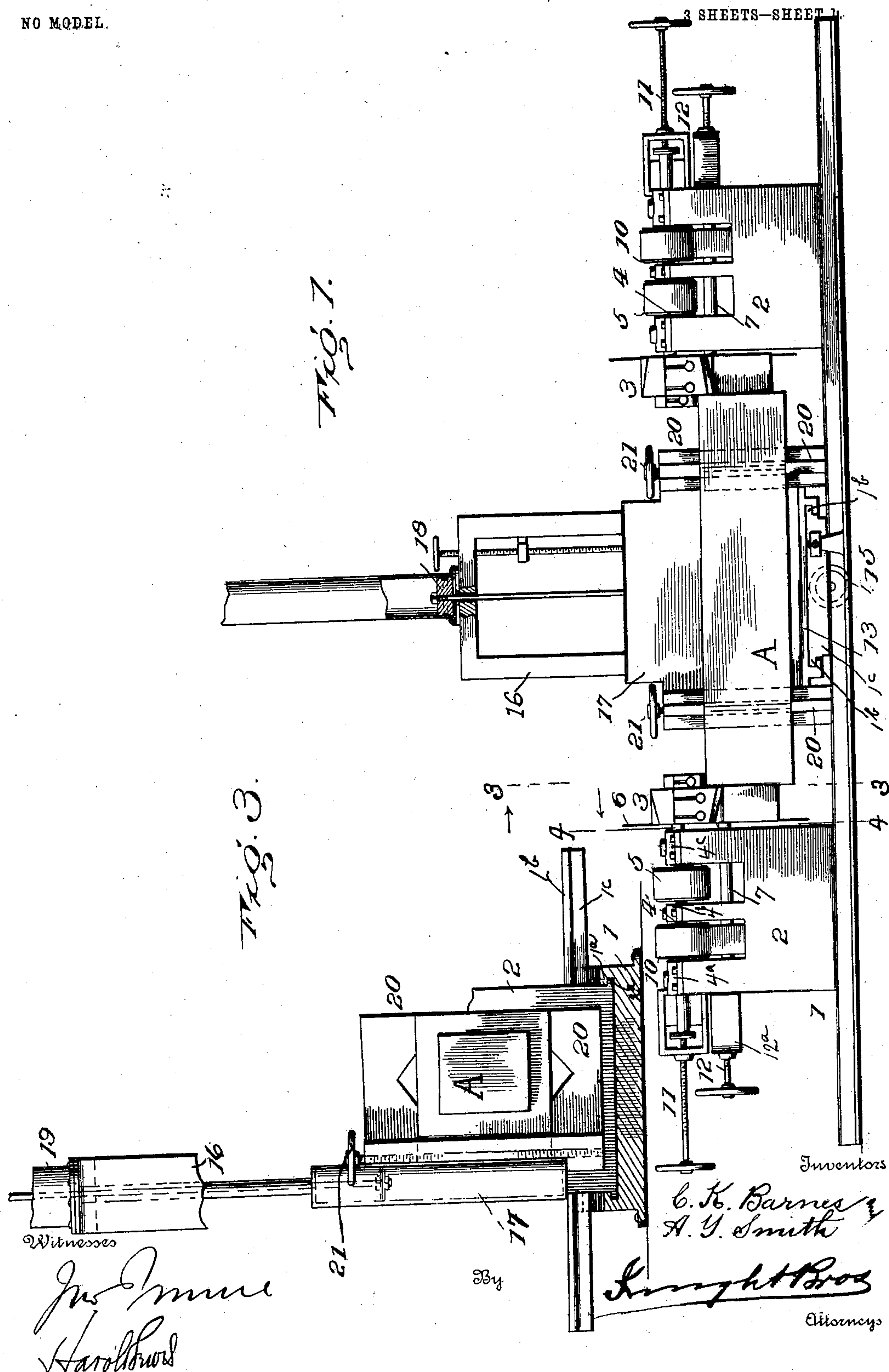
No. 735,933.

PATENTED AUG. 11, 1903.

C. K. BARNES & A. Y. SMITH.
MINE TIMBER FRAMING MACHINE.

APPLICATION FILED FEB. 19, 1903.

NO MODEL.



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3 SHEETS—SHEET 2.

Fig. 4.

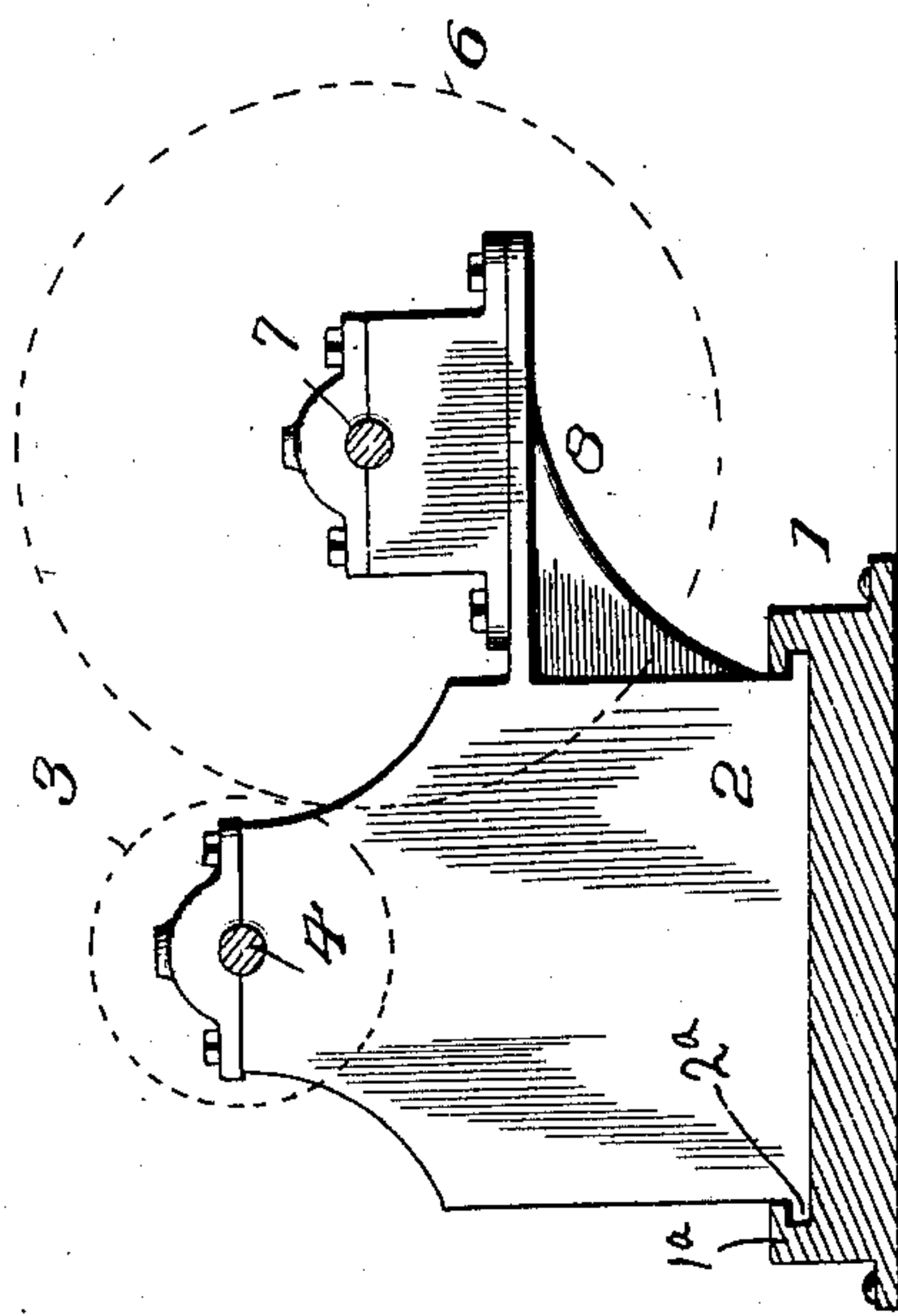
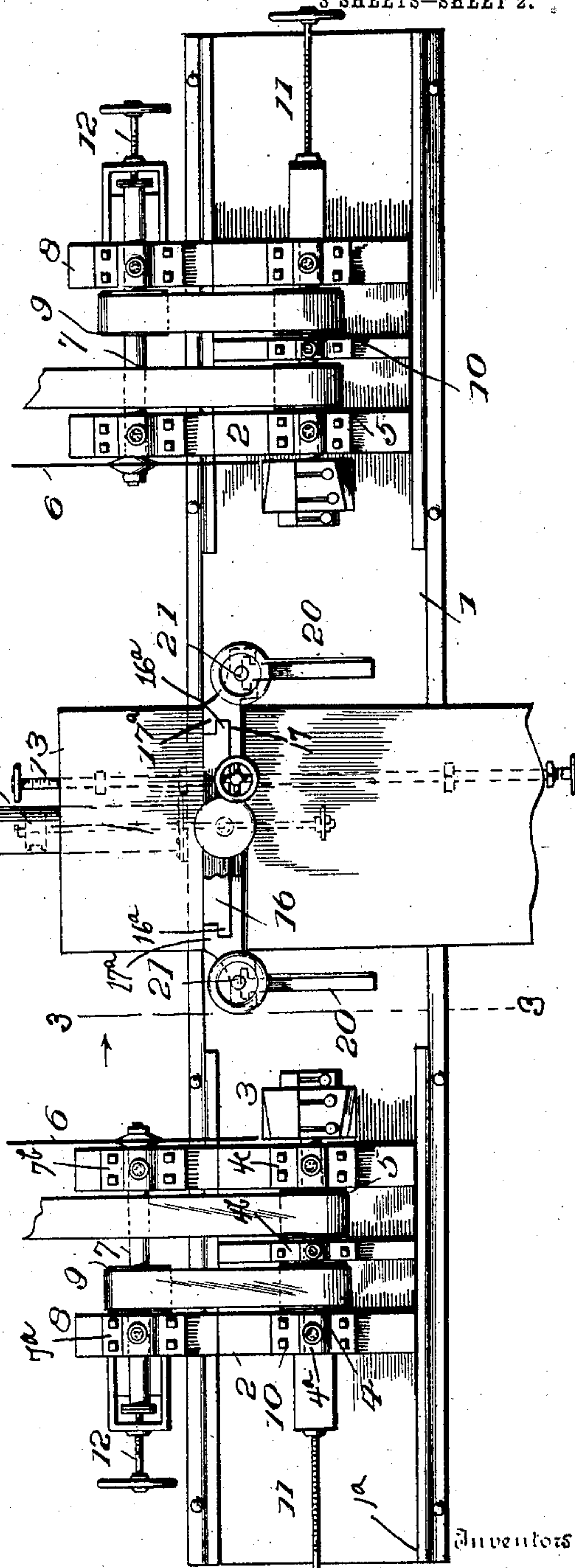


Fig. 2.



Witnesses

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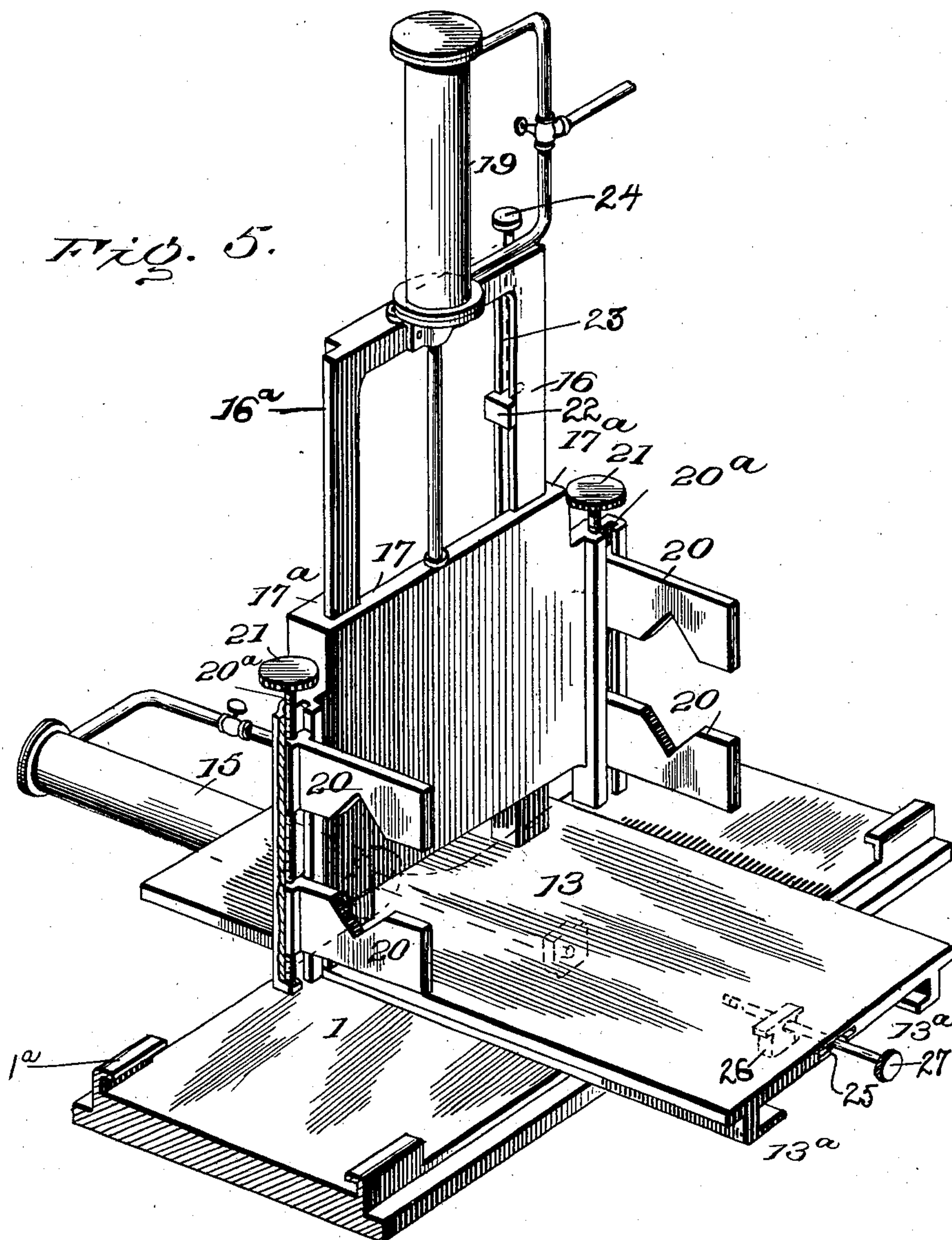
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3 SHEETS—SHEET 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

CHARLES KENNETH BARNES AND ANDREW YOUNG SMITH, OF PEARCE,
ARIZONA TERRITORY.

MINE-TIMBER-FRAMING MACHINE.

SPECIFICATION forming part of Letters Patent No. 735,933, dated August 11, 1903.

Application filed February 19, 1903. Serial No. 144,061. (No model.)

To all whom it may concern:

Be it known that we, CHARLES KENNETH BARNES and ANDREW YOUNG SMITH, citizens of the United States, and residents of Pearce, in the county of Cochise and Territory of Arizona, have invented certain new and useful Improvements in Mine-Timber-Framing Machines, of which the following is a specification.

The invention relates to a machine for dressing and fitting the ends of timbers—such, for instance, as timbers used in constructing the framing for timbering mines; and the invention has for its object to provide a machine into which a timber can be introduced and by a series of quick manipulations or movements, preferably effected through power mechanism, brought into such relation with rotary power-driven tools that the timber will be cut off to the proper length and its ends reduced successively on its four sides to form suitable tenons for framing.

A further object of the invention is to devise a machine which will perform this operation with the greatest economy of labor and time.

The invention will be fully understood upon reference to the accompanying drawings, in which—

Figure 1 is a side elevation of the improved mine-timber-framing machine. Fig. 2 is a plan view of the same. Fig. 3 is a vertical transverse section on the line 3 3, Figs. 1 and 2, in the direction of the arrows, showing an elevation of the timber-clamps; and Fig. 4 is a transverse section on the line 4 4, Fig. 1, in the direction of the arrows, the saw and the tenoning-head not being seen in this view. Their position is shown in dotted lines. Fig. 5 is a perspective view of the means for manipulating or moving the timber.

It being ordinarily desirable to dress both ends of a mine-timber, the machine herein represented as embodying the invention is designed to treat opposite ends of the timber simultaneously; but it is to be understood that the scope of the invention is not limited to a double machine of this character, but extends in its scope to a machine for treating one end of the timber alone. Inasmuch as both ends of the machine are substantially

identical, we will describe the invention by referring more especially to one end alone.

1 represents a bed-plate, upon the opposite ends of which are suitably mounted longitudinally-adjustable pillow-blocks 2, substantially identical in construction and equipment. These pillow-blocks are provided with guiding-flanges 2^a upon each side, which are guided in vertical grooved tracks 1^a on the bed-plate 1. Each pillow-block 2 carries a tenoning-head 3, mounted on an arbor 4, movable axially, journaled in bearings 4^a, 4^b, and 4^c and rotated by a pulley 5, mounted thereon, and a crosscut-saw 6, having an arbor 7, journaled in bearings 7^a and 7^b, mounted on a bracket 8 on the pillow-block and receiving rotary motion through a pulley 9, mounted upon the arbor 7 and belted to a pulley 10 on the arbor 4. The tenoning-head 3 preferably has an axial dimension corresponding to the length of the tenon to be formed, and the saw 6 is positioned so as to cut off the end of the timber beyond the portion dressed by said head.

11 and 12 represent adjusting-screws connected, respectively, to the axially-movable arbors 4 and 7 and working through frames 11^a and 12^a, fixed to the pillow-block. By said adjusting-screws the head and saw may be respectively adjusted in axial directions.

The timber is held in an intermediate position between the respective dressing mechanisms and is manipulated so as to cut off the ends of the timber to proper length and to dress its four sides adjacent to its ends to form tenons by the following mechanism: 13 represents a central transversely-sliding table whose position on the main bed-plate 1 is controlled by a piston 14, secured to the under side of the table at one end and working in a hydraulic or other pressure cylinder 15, mounted in a fixed relation to the bed-plate 1, and to the opposite ends of which suitable fluid-pressure may be introduced at will through the medium of suitable valve connections. (Not shown in detail.) The table 13 is guided upon the bed-plate 1 by means of a pair of tracks 1^b, formed upon the sides of a plate 1^c, secured to the bed-plate, and depending and inwardly-turned tracks 13^a, secured to the table 13 and embracing the

tracks 1^b. 16 represents a standard mounted upon and movable with the table 13, upon which standard is mounted a vertically-sliding frame 17, whose elevation and vertical movement are under control of a piston 18, secured to the sliding frame and working in a vertical cylinder 19, mounted upon the standard 16 in a fixed relation to the table 13 and into which cylinder any suitable fluid-pressure medium may be introduced at will, so as to move the piston 18 in either direction or hold it to any position in which it may be adjusted, and thereby raise and lower the vertically-sliding frame 17 on the table 13. The vertically-sliding frame 17 is guided in its vertical movement by guiding-ribs 17^a, formed on the sides thereof, which guiding-ribs embrace tracks 16^a on the standard 16. Mounted on each end of and movable with the frame 17 is a pair of timber-clamps 20, sliding in vertical grooves 20^a and moved so as to bring the jaws of each clamp to or from each other by means of adjusting-screws 21, having right and left hand threads engaging the respective jaws. This simultaneous adjustment of the jaws of the clamps causes the timber to be centered in proper position whatever its size may be and whether it is of uniform diameter or tapering and insures the formation of the tenons on the ends symmetrically with the axis of the timber.

The operation of the machine is as follows: Power being transmitted from any suitable source to the pulleys 5 revolves the tenoning-heads 3 and the saws 6, the table 13 being moved toward the front side of the machine to receive the timber. The timber A is suitably centered in the clamps 20, and the table 13 is then moved forwardly by piston 14 in cylinder 15 to bring the plane of the contemplated tenon-faces on the rear side of the timbers in the vertical plane of the front side of the cutting-head. Upward vertical movement is then imparted to the frame 17 by fluid beneath piston 18 to form rear side of tenon. Suitable tenon gage-stops 22, which are mounted on grooves 23 on standards 16, similar to the grooves 20^a, and adjusted by screws 24, regulate the travel of frame 17, so that the plane of tenon-faces to be cut on under side of the timber stops in line with the upper horizontal plane of cutting-heads, the fluid-pressure in cylinder 19 holding the frame firmly against these gage-stops. The table 13 is then moved rearward by piston 14 in cylinder 15 to form the lower faces of tenons. Tenon gage-stops 25, which are mounted in grooves 26 on the under side of the table 13 and adjusted by screws 27 are utilized on the bed-plate to regulate the travel of table 13, so that the vertical plane of the rear side of cutting-head is in line with the forward side of the tenon to be cut, and fluid is then introduced in the upper end of cylinder 18 to impart downward movement to the frame 17, so as to form the front side of the tenon. This last movement passes the timber along the

crosscut-saw 6, cutting the tenon to proper length. Fluid is then introduced into the rear end of cylinder 15 to impart forward movement to table 13, which forms the lower and last side of tenon, the table 13 being then in position to permit removal of the timber.

In the manner above described timbers may be rapidly introduced into the machine, cut to proper length, and then by the four successive adjustments, followed by appropriate movements, the four faces of the tenons may be cut in rapid succession and the timber discharged from the machine.

Obviously by longitudinal adjustment of the pillow-blocks 2 the machine may be adapted for different lengths of timbers.

Having thus described the invention, the following is what is claimed as new therein:

1. The combination with a tenoning-head, of a work-support, and means for giving a proper travel for cutting purposes to such support past said head in a substantially straight line forward and backward, and means for giving another such travel at an angle to said first-mentioned travel and for maintaining the positions of the support obtained by one travel in either direction during the other travel, so that the two travels may be combined in succession to constitute a circuit about the tenoning-head.

2. The combination with a tenoning-head of a work-support having means for clamping and centering the work, means for giving a proper travel for cutting purposes to such support past said head in a substantially straight line forward and backward, and means for giving another such travel at an angle to said first-mentioned travel and for maintaining the positions of the support obtained by one travel in either direction during the other travel, so that the two travels may be combined in succession to constitute a circuit about the tenoning-head.

3. The combination with two tenoning-heads spaced apart and a work-support arranged in the intervening space, of means for giving a proper travel for cutting purposes to such support past said head in a substantially straight line forward and backward, and means for giving another such travel at an angle to said first-mentioned travel and for maintaining the positions of the support obtained by one travel in either direction during the other travel, so that the two travels may be combined in succession to constitute a circuit about the tenoning-head.

4. The combination with a tenoning-head, of a work-support, means for giving a proper travel for cutting purposes to such support past said head in a substantially straight line forward and backward, means for giving another such travel at an angle to said first-mentioned travel and for maintaining the positions of the support obtained by one travel in either direction during the other travel, so that the two travels may be combined in succession to constitute a circuit about the tenoning-

head, and means for adjustably determining the range of travel of such support in every direction.

5 In a tenoning-machine, the combination of a timber-support, and means for feeding said timber-support in vertical and horizontal directions transversely to the axis of the tenoning-heads and past the same in cutting relation thereto, and tenoning-heads upon
10 each side of said timber-support, movable axially to and from the same.

6 In a tenoning-machine, the combination of a timber-support, and means for feeding said timber-support in vertical and horizontal directions transversely to the axis of the tenoning-heads and past the same in cutting relation thereto, timber clamps having jaws movable to and from one another simultaneously, and tenoning-heads upon each side of
15 said timber-support, movable axially to and from the same.

7 In a tenoning-machine, the combination of a suitable tenoning-head, a suitable timber-support, means for feeding said timber-support horizontally past the head, adjustable stops for determining the range of such feed, means for feeding said timber-support vertically past the head, and adjustable stops for determining the range of said feed.
25

8 In a tenoning-machine, the combination of a suitable axially-movable tenoning-head and an axially-movable saw for cutting off the end of a timber beyond the work of said head, a table having a transverse feed, a timber-support mounted on said table, with vertical feed movement and means for imparting a transverse movement to the table and the vertical movement to the timber-support at will and for setting the limits of such motions
30 and thus determining the range of travel of the work about the tenoning-head.

9 In a tenoning-machine, the combination of a tenoning-head, the transversely-moving table, a standard on said table, a vertically-moving frame on said standard, a timber-sup-
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port on said frame, and horizontal and vertical fluid-pressure cylinders having pistons connected respectively with the transversely-moving table and the vertically-moving frame.

10 In a tenoning-machine, the combination of a bed-plate, longitudinally-adjustable pillow-blocks on said bed-plate, tenoning-heads and circular saws mounted upon longitudinally-disposed arbors on said pillow-blocks, with the cutting peripheries of the saws extending below those of the cutting-heads, a table moving transversely upon said bed-plate, between the cutting-heads and between the saws, a hydraulic cylinder having a piston connected with and moving said table, a frame moving vertically on said standard, and carrying timber-clamps, and a hydraulic cylinder having a piston connected with and imparting movement to said vertically-moving frame.
50 55 60 65

11 In a tenoning-machine, the combination of the bed-plate, the table supported at an intermediate position on the bed-plate and sliding transversely thereto, the vertical standard on said table, the vertically-sliding frame on said standard, the timber-clamps on said frame, right and left threaded screws engaging the respective jaws of the clamps, means for moving and fixing the table and frame at will in the respective directions of their adjustment; the pillow-blocks longitudinally adjustable on said bed-plate to and from the transversely-sliding table, the tenoning-heads mounted on axially-movable longitudinal arbors on said pillow-blocks, and adjustable stops limiting the movement of the table and the frame.
70 75 80

The foregoing specification signed this 16th day of January, 1903.

CHAS. KENNETH BARNES.
ANDREW YOUNG SMITH.

In presence of—

M. F. COLLIS,
W. J. MORTELL.