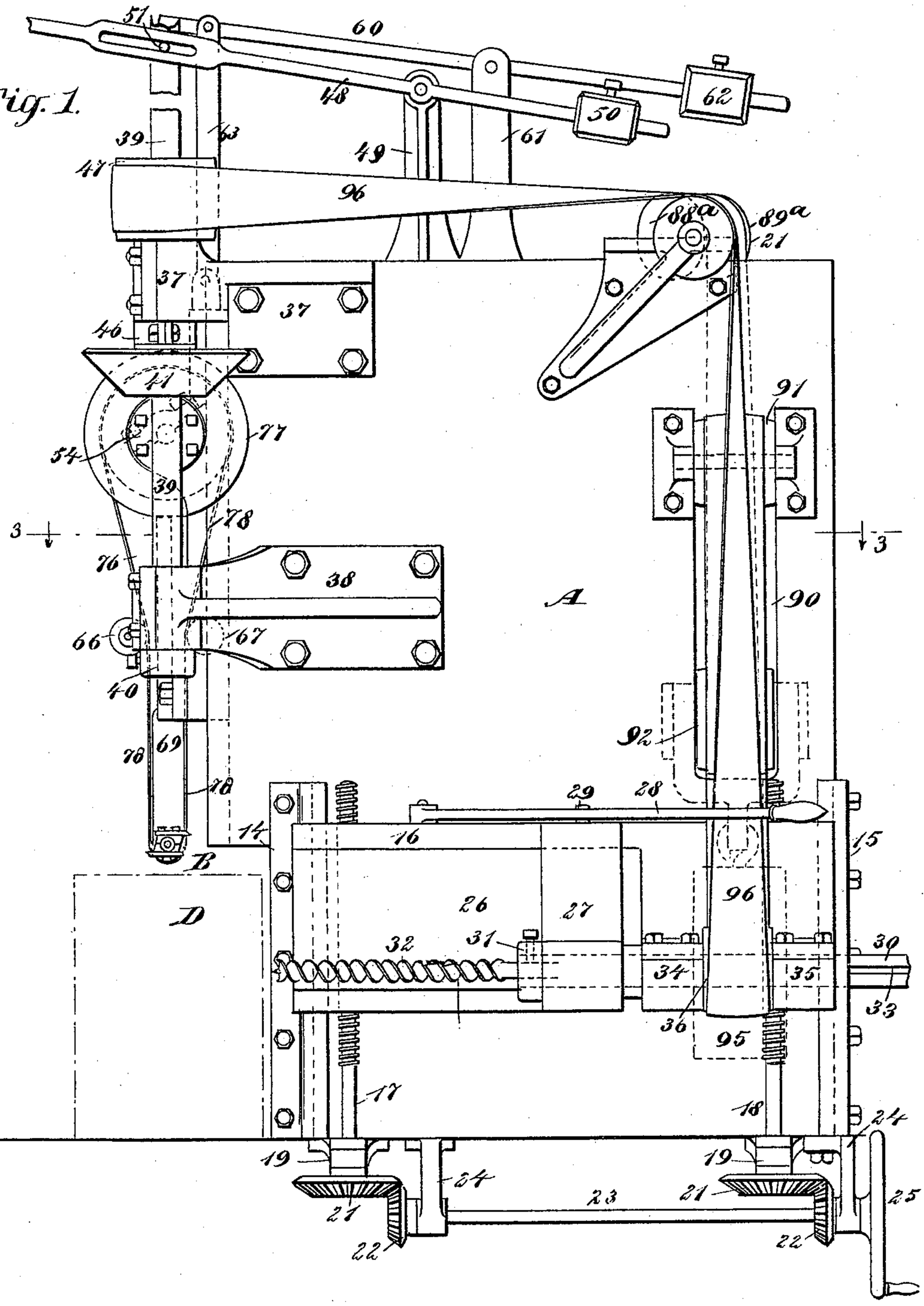
(No Model.) 4 Sheets—Sheet 1.

C. P. TURNER.

TIMBER MORTISING MACHINE.

No. 493,133. Patented Mar. 7, 1893.

Fig. 1.



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(No Model.) 4 Sheets—Sheet 2.

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Fig. 2.

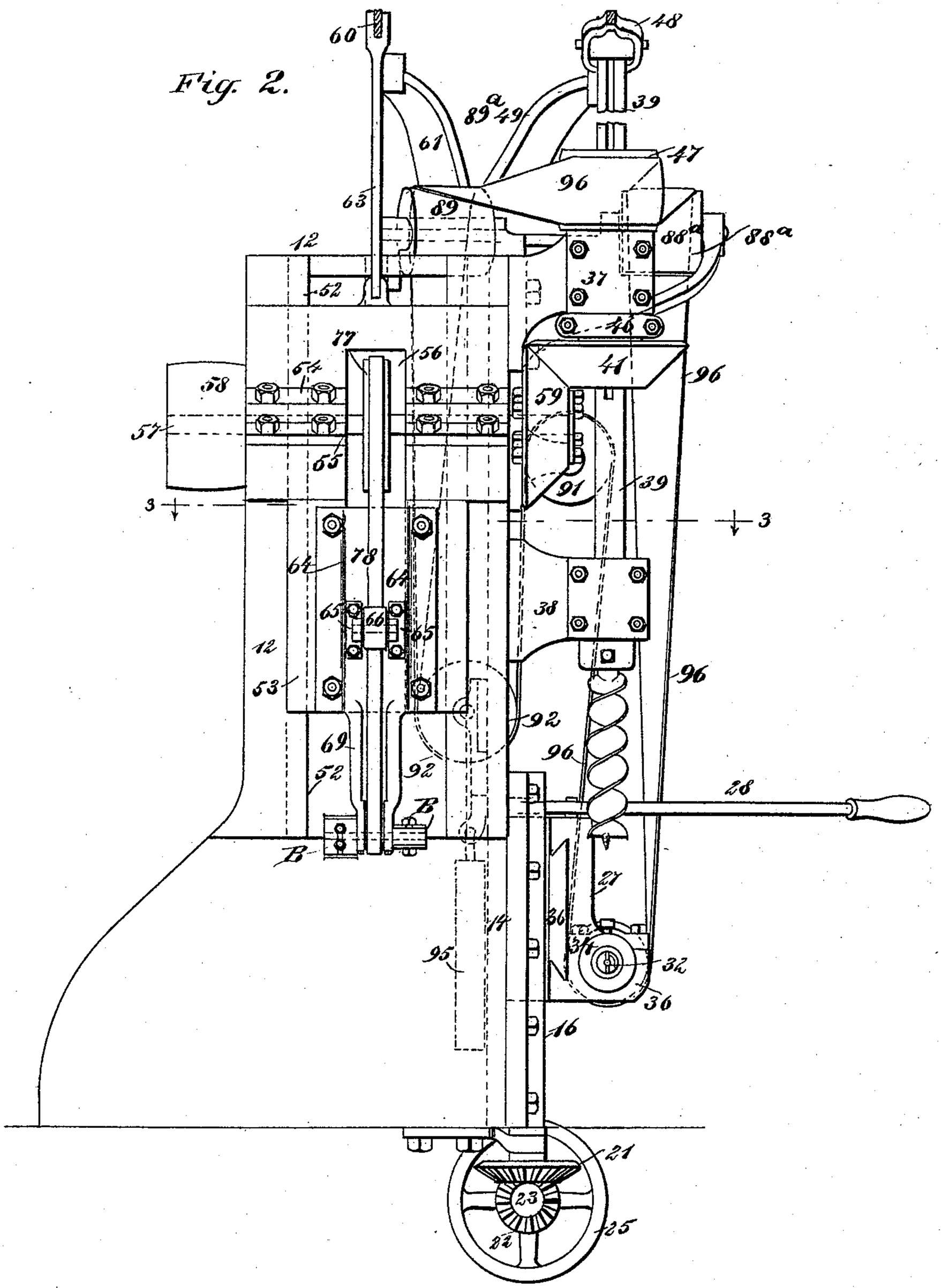

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Fig. 3.

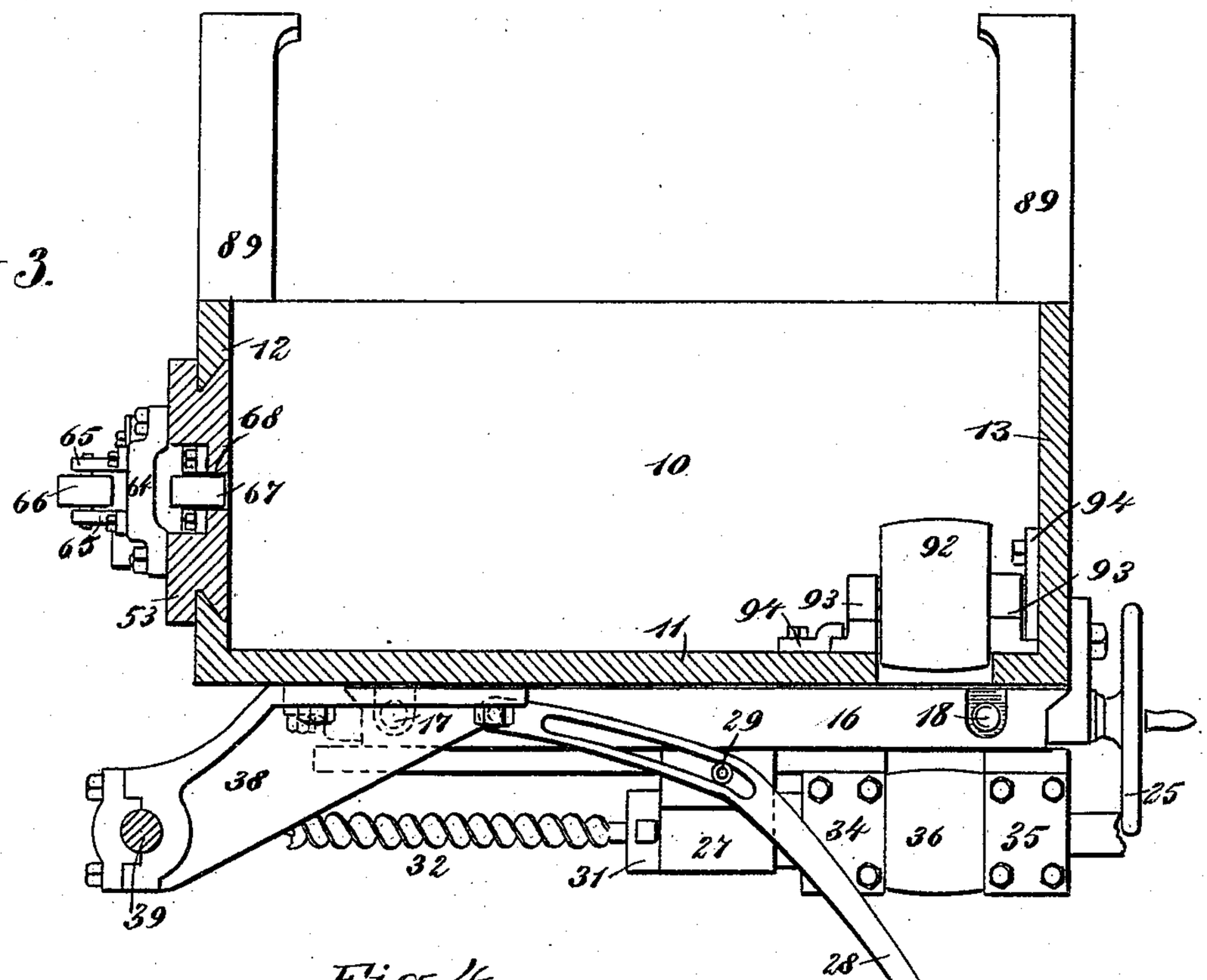


Fig. 4

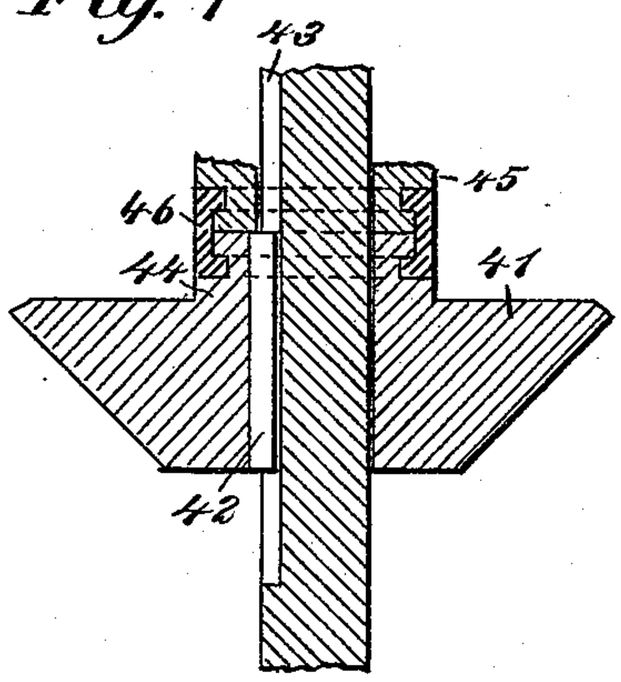


Fig. 5.

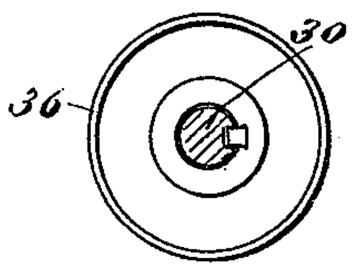
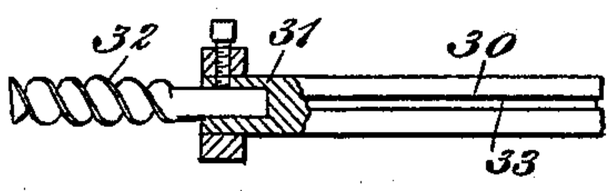


Fig. 6.



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TIMBER MORTISING MACHINE.

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Fig. 7.

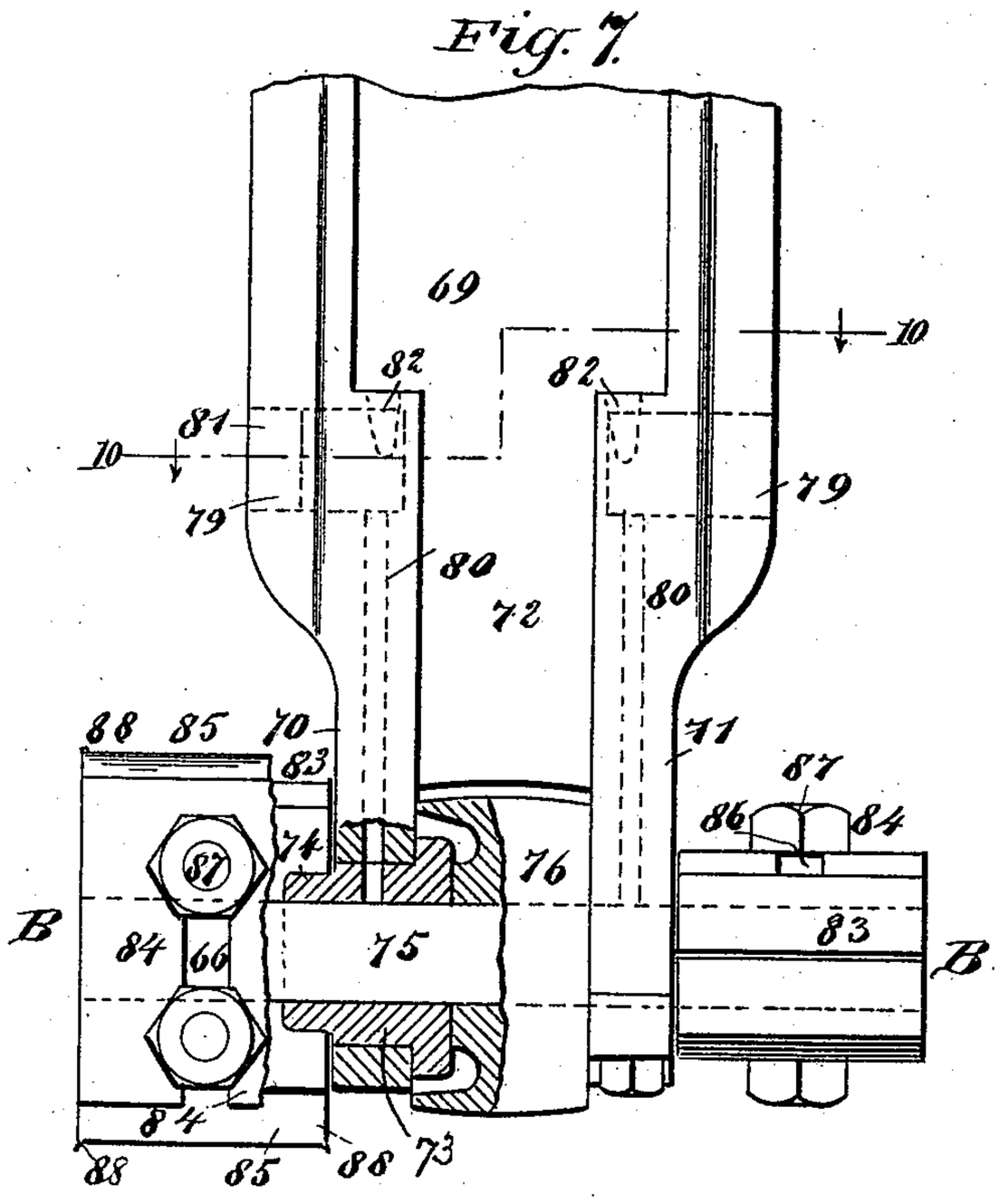
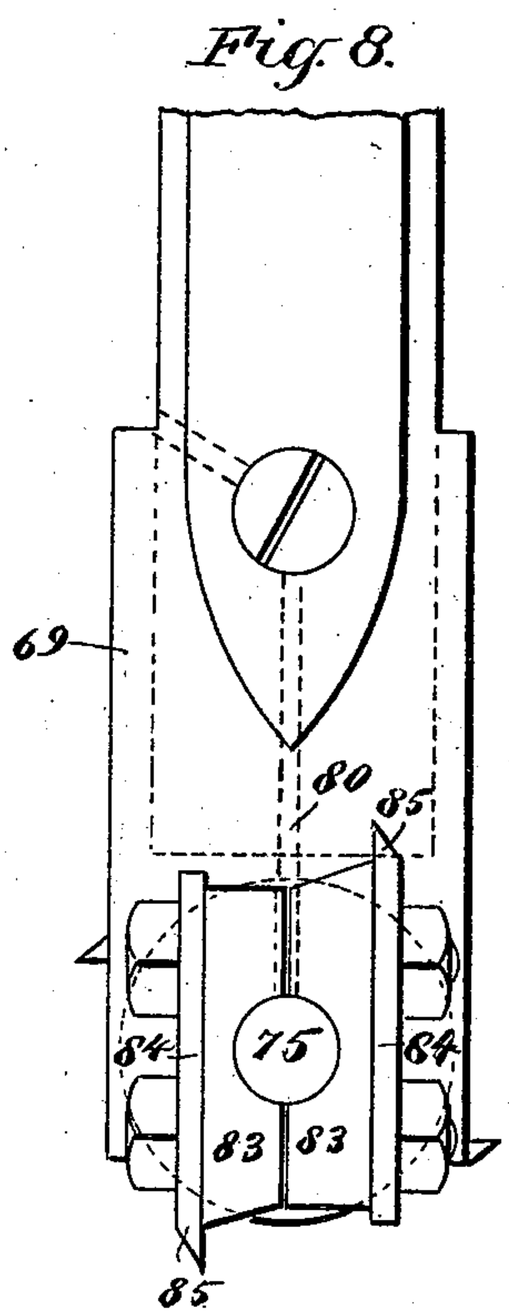


Fig. 8.



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UNITED STATES PATENT OFFICE.

CHARLES P. TURNER, OF JOHNSTOWN, PENNSYLVANIA.

TIMBER-MORTISING MACHINE.

SPECIFICATION forming part of Letters Patent No. 493,133, dated March 7, 1893.

Application filed February 24, 1892. Serial No. 422,607. (No model.)

To all whom it may concern:

Be it known that I, CHARLES P. TURNER, of Johnstown, in the county of Cambria and State of Pennsylvania, have invented a new and useful Improvement in Timber-Mortising Machines, of which the following is a full, clear, and exact description.

My invention relates to an improvement in timber mortising machines, and has for its object to provide a machine of simple, durable and economic construction, capable of use especially for producing mortises in large timbers or in heavy beams; and a further object of the invention is to so construct the machine that vertical or horizontally placed augers or boring tools may be brought into action as may be desired, and whereby also cutters capable of removing material between three adjacent bores or apertures in the timber or beam may be expeditiously and conveniently effected, and whereby also the cutter and the augers may be adjusted in a convenient manner to carry them to an engagement with the beam or timber to be operated upon, or out of engagement therewith.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth and pointed out in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a front elevation of the machine. Fig. 2 is a side elevation. Fig. 3 is a horizontal section taken practically on the line 3—3 of Figs. 1 and 2. Fig. 4 is a sectional detail view, illustrating the manner in which one of the friction pulleys is attached to the vertical bearing shaft. Fig. 5 is a sectional view taken through one of the shafts, illustrating the manner in which the pulleys are secured thereto. Fig. 6 is a detail view illustrating the manner in which the horizontal auger is attached to its shaft, and the construction of the shaft. Fig. 7 is a front elevation of the head adapted to carry the rotary or mortising cutters. Fig. 8 is a side elevation of the head and of one of the cutters.

The frame A of the machine is somewhat rectangular in general contour, and comprises virtually a base 10, as shown in Fig. 3, a vertical front plate 11, and side plates 12 and 13. Upon the front of the frame, at or near its lower end, vertically spaced slideways 14 and 15, are located. In the slideways 14 and 15 a block 16, is capable of sliding movement, the ends of the block having practically a dovetail connection with the slide ways, and the vertical adjustment of the block is usually effected through the medium of two vertically located screws 17 and 18, held to turn in threaded apertures produced directly in the back portion of the block, or in projections formed upon the back. The lower ends of these screws turn in bearings 19, located at the lower edge of the front of the frame, and have provided at their lower extremities bevel gears 21, and these gears mesh with beveled pinions 22, fast upon an adjusting shaft 23, journaled in bearings 24, also projected downward from the bottom of the frame; and at the outer end of the shaft 23, a hand wheel 25, is located, by means of which the shaft is turned, but if in practice it is found desirable any equivalent of the hand wheel may be substituted therefor. In the forward portion of the front face of the block a horizontal groove 26, is produced, the side walls of which are preferably under cut, and in this groove a bearing block 27, is capable of horizontal movement, movement being given to the block through the medium of a lever 28, usually fulcrumed upon the vertically movable block 16, and the said lever is ordinarily provided with a slot through which a pin 29, extends, the said pin being attached to the upper portion of the bearing block.

A horizontal shaft 30, is journaled near its forward end in the bearing block, this forward end being provided with a head 31, to receive a horizontal auger 32, or equivalent form of boring tool, the shank of the tool being usually held in the head by means of a set screw, as shown in Fig. 6. The shaft 30, which I will denominate the horizontal boring shaft, is provided with a longitudinal channel 33; and the shaft in addition to being journaled in the sliding journal or bearing block 27, is also journaled in two boxes 34 and 35, secured to the main or vertically adjustable block 16, some slight distance apart and at the rear of the sliding boring block.

Upon the shaft 30, between the fixed boxes

34 and 35 a pulley 36, is located, which pulley is provided with a feather fitted in the channel 33 of the shaft. The boxes 34 and 35 serve to prevent the pulley from moving laterally, while it is evident that when the lever 28 is manipulated the shaft 30 may be carried forward or rearward to bring the auger 32 in position for use, or to carry it out of engagement with the beam or timber operated upon.

Brackets 37 and 38, are secured to the front of the machine frame and extend outward at an angle beyond the forward side 12, as shown in Figs. 1 and 3. In these brackets a vertical shaft 39, is journaled, the said shaft being capable of vertical movement in the brackets. The lower end of the shaft 39, which I denominate the vertical boring shaft, has a head 40, formed at its lower end to receive the shank of the auger or like tool. The shaft is provided with a channel, which may extend from end to end, and upon the shaft a horizontally disposed friction wheel 41, is located, preferably just below the upper bracket. This friction wheel is provided with a key or spline 42, adapted to enter a keyway or channel 43 in the shaft, as shown in Fig. 4.

It is desirable that the friction wheel 41 should not move vertically while it is able to rotate freely, and many devices may be employed for effecting this result, one of which is illustrated in Fig. 4, which consists in grooving the hub 44 of the pulley, and likewise grooving the bearing 45 adjacent to the hub, and loosely mounting the pulley to turn independently of the bearing by means of straps 46, shown in end view in Fig. 1, which straps are bolted together at their extremities and are provided with bolts entering the grooves in both the pulley and the bearing.

In Fig. 5 is illustrated the pulley 36 and the horizontal boring shaft 30, and clearly shows the manner in which that pulley is mounted upon the shaft.

The vertical boring shaft 39, extends some distance upward above the top of the frame, and has mounted thereon a driving pulley 47, in like manner that the pulley 36 is mounted upon the horizontal shaft 30. The upper end of the vertical boring shaft is connected with a lever 48, which lever is fulcrumed upon a standard 49, secured to the top of the frame in any approved manner; and the rear end of the lever is provided with an adjustable weight 50, and through the medium of this weight the shaft 39, is normally held in its upper elevated position. The handle end of the lever extends some distance beyond the shaft, and the connection between the shaft and the lever is shown as consisting of a pin 51, attached to the shaft and passing through a slot in the lever, as illustrated in Fig. 1.

In the side 12, of the frame a slide-way 52, is made for the reception of a head 53. This head has a transverse bracket 54, secured thereon, the bracket being at an angle to the outer face of the head, as shown in dotted lines Fig. 1. The bracket at or near its center is provided with an opening 55, and the head 53, is provided with a corresponding opening 56. The drive shaft 57 of the machine is journaled in this bracket transversely of the cross head, and the shaft extends beyond both front and rear faces of the side 12 of the frame, being provided at its rear face with a driving pulley 58 and at its forward end with a friction pulley 59, the latter pulley being adapted for engagement with the friction pulley or wheel 41, mounted upon the vertical boring shaft. This cross head is raised and lowered through the medium of a lever 60, fulcrumed upon a standard 61, located at the top of the frame and carrying at its rear end an adjusting weight 62, which lever may be connected with the cross head in any suitable or approved manner, the connection shown consisting of a link 63. Near the bottom of the cross head a somewhat arch-shaped plate 64, is bolted, shown in plan view in Fig. 3, and this plate carries ears 65, between which a guide pulley 66, is journaled; and back of the arched plate 64, in horizontal alignment with the front guide pulley 66, a rear guide pulley 67, is journaled, and the manner of locating this pulley shown in the drawings consists in producing a recess 68 in the front face of the cross head back of the arched plate, in which recess the trunnions of the pulley are journaled. A foot 69, is projected downward from the lower end of the cross head, and this foot at its lower end is bifurcated, producing members 70 and 71, and both sides of the foot have channels 72, formed therein, as shown in Figs. 7, 9 and 10. In the members 70 and 71 of the foot bushings 73, are secured, being provided with outwardly extending bosses 74; and in these bushings a shaft 75, is journaled, which shaft extends beyond the side faces of both members, and is adapted to receive mortising cutters B. Between the members of the foot a pulley 76, is secured upon the cutter shaft 75; and upon the drive shaft 57 within the opening 56 in its bearing 54 and the cross head, a pulley 77, is secured upon said shaft carrying a belt 78, which passes downward, as shown in Fig. 1, over the inner faces of the guide pulleys 66 and 67, and thence downward over the pulley 76 upon the mortising cutter shaft, the guide pulleys 66 and 67, serving to bring the belt in vertical alignment with the peripheral portions of the pulley.

The mortise-cutter shaft may be lubricated in any suitable or approved manner, as for instance, in the sides of the foot recesses 79 may be produced, connecting with oil channels 80, the latter leading down to the shaft, the recesses 79, being normally closed by plugs 81; and a bore 82, may be produced in the front face of the foot leading down into the recesses 79, so that oil may be introduced into the channels 80 without removing the plugs 81. Each of the mortise cutters consist of a block 83, which is preferably made in two sections, and is rigidly secured upon the

shaft 75, the sections of the blocks being provided with recesses to receive the bosses 74 of the bushings 73. The blocks may be rectangular in cross section or may be of the irregular shape shown in Fig. 8, preferably the latter, as when so formed the blocks afford the greatest amount of bearing for the cutting blades 84, two of which are employed in connection with each block and located at opposite sides.

The entire machine is portable, and may be placed upon beams 89, or upon a table, and the beam or timber D to be cut is located beneath the mortising cutters and the vertical boring tool, and in front of the horizontal boring tool, as indicated in dotted lines, Fig. 1.

Two pulleys 88^a and 89^a, are located at the top of the frame at the back, and stand at an angle to the sides of the frame; and in the front of the frame, near the back, in an opening 90, produced in that surface of the frame, a guide pulley 91, is journaled, and in the lower portion of the opening 90, another pulley 92, is journaled, the trunnions of this latter pulley being mounted in bearings 93, capable of sliding in suitable guides 94, formed upon the rear face of the front of the frame, as illustrated in Fig. 3. The bearings 93 of this pulley have attached thereto a weight 95, as is best shown in Figs. 1 and 2. This pulley is adapted to take up slack in a belt 96 when the vertical boring shaft is adjusted upward or downward, the said belt being made to pass over the pulley 47 upon the vertical boring shaft, over the angularly located pulleys 88^a and 89^a, over the pulley 91, the vertical pulley 92, and also over the pulley 36 upon the horizontal boring shaft. Thus no matter in what direction the vertical boring shaft may be carried the belt 96, will always have sufficient tension exerted thereon to drive the horizontal boring shaft when occasion may demand.

In operation, if it is desired to bore horizontally-located apertures into the timber, the lever 28, is manipulated to carry the auger or boring tool 32 into engagement with the timber and to gradually feed it forward. These horizontally-located apertures are ordinarily made only to receive dowel pins to be driven into the mortise. In producing a mortise a series of closely grouped holes are first bored into the timber or beam by dropping the vertical boring shaft 39 a sufficient distance to bring the tool carried thereby in engagement with the timber, and it is fed downward by the manipulation of the lever 48. After these holes have been bored, the shaft 39, is elevated so as to be out of the way, and the cross head 54, is lowered by the manipulation of the lever 60, in such a manner that the lower end of the foot upon the cross head may be located over one of the holes, whereupon, the cutters B, carried by the foot will break away or remove all of the wood between the aperture over which the foot is located and one at each side of it. The foot is carried downward a sufficient distance to give proper depth to the mortise, and the cutters B, impart to the mortise the ordinary practically square contour.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a machine for producing mortises, the combination, with a block or head vertically adjustable, and an adjusting shaft having connection with the block or head, of a boring block having lateral movement upon the vertically adjustable block or head, boxes secured to the block or head, a shaft journaled in the adjustable block and the bearing boxes, the said shaft being provided with a longitudinal groove or channel and a head to receive a boring tool, a pulley mounted upon the shaft between the boxes and provided with a spline fitted to the groove in the shaft, and a lever fulcrumed upon the block or head and connected with the adjustable bearing block, as and for the purpose set forth.

2. In a machine for producing mortises, the combination, with a shaft adjustable to and from an object and fitted with a head adapted to receive a cutting tool, of a cross head having vertical movement and provided with a foot, a shaft journaled in said foot, a drive shaft carried by the cross head, a belt connection between the drive shaft and the shaft in the foot, and mortise cutters attached to the shaft in the foot, as and for the purpose set forth.

3. In a machine for producing mortises, the combination with a shaft capable of adjustment to and from a given object and fitted with a head at one end to receive a boring tool, and a lever controlling the movement of the shaft, of a cross head capable of vertical movement and having a foot journaled at its lower end, a shaft journaled in the foot of the cross head, a drive shaft journaled upon the cross head, a belt connection between the drive shaft and the shaft in the foot, a driving connection between the drive shaft and the boring shaft, and cutters secured one at each end of the shaft in the foot, as and for the purpose specified.

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Witnesses:
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