

J. McWILLIAMS.
BAND RESAW AND DOUBLE JOINTER.
APPLICATION FILED SEPT. 19, 1908.

914,746.

Patented Mar. 9, 1909.

6 SHEETS—SHEET 1.

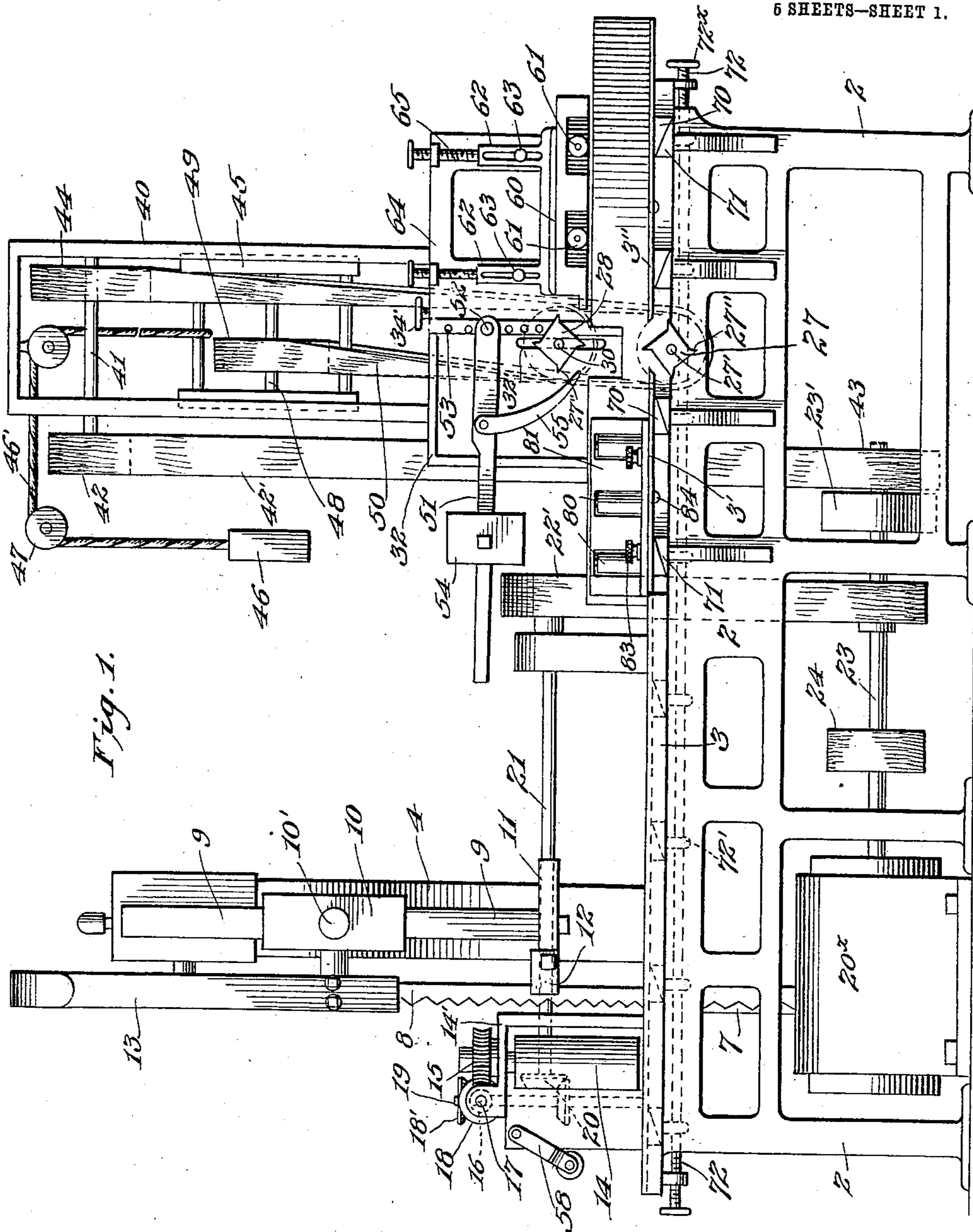


Fig. 1.

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5 SHEETS—SHEET 2.

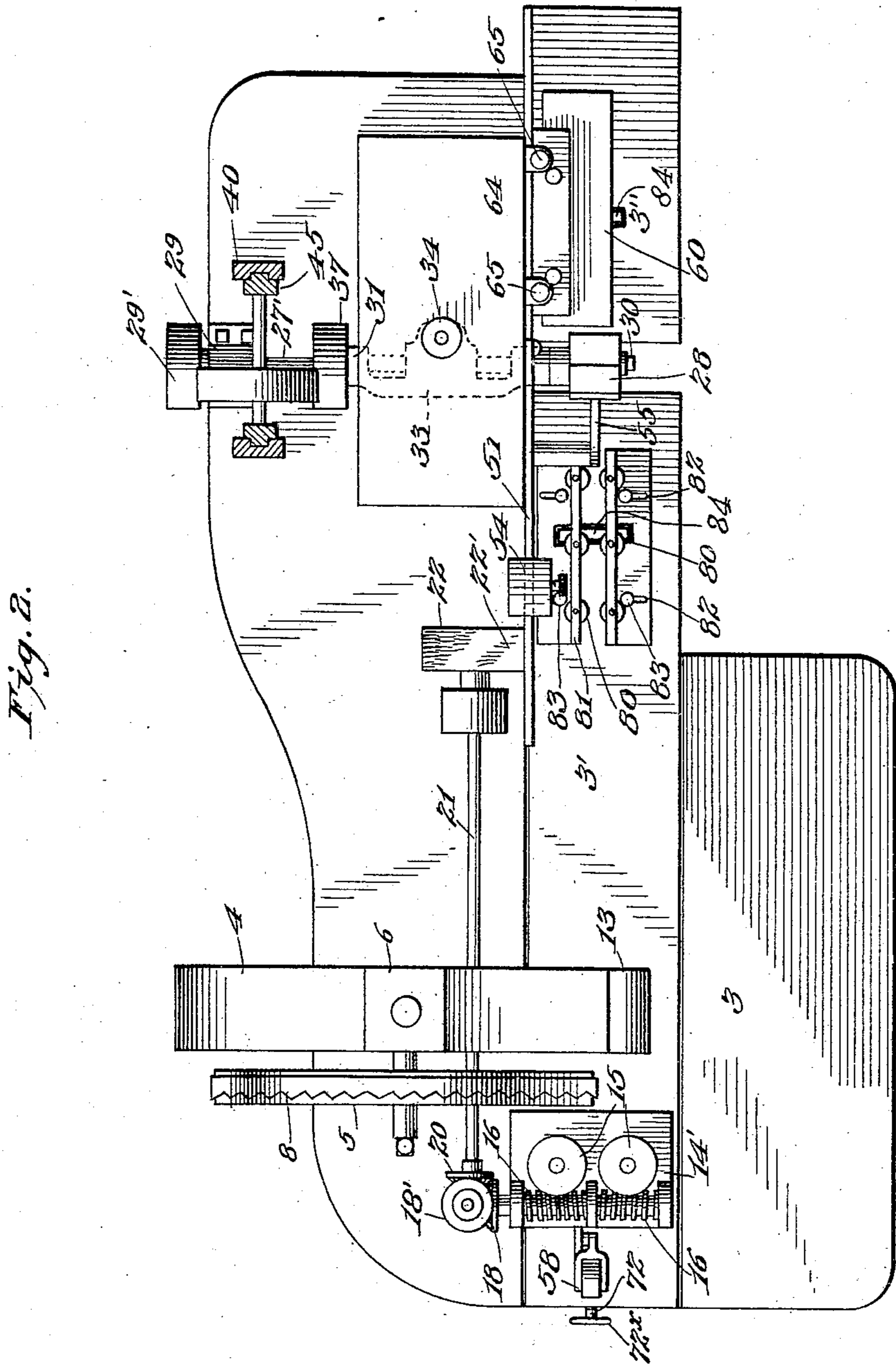


Fig. 2.

Witnesses:

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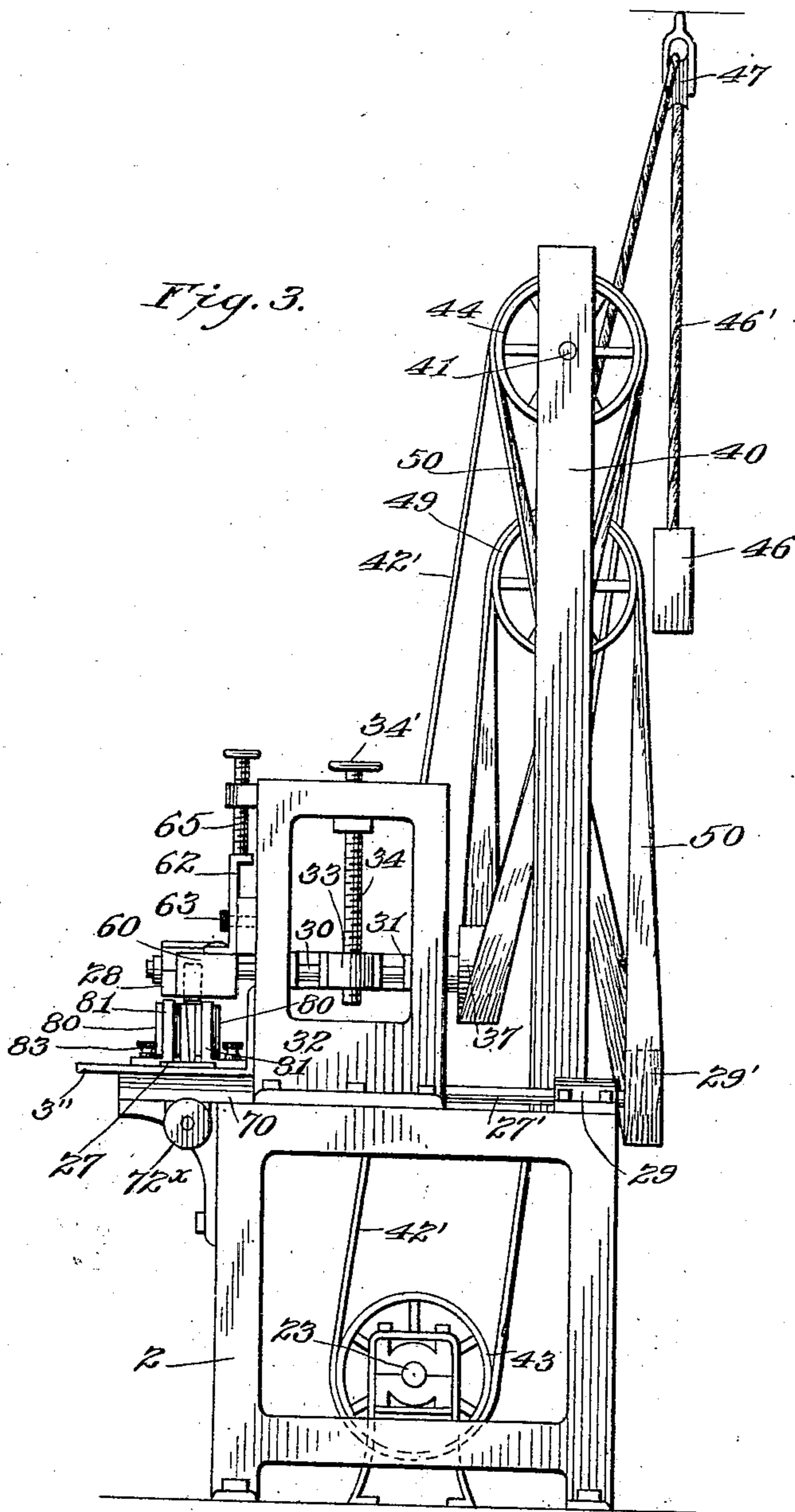
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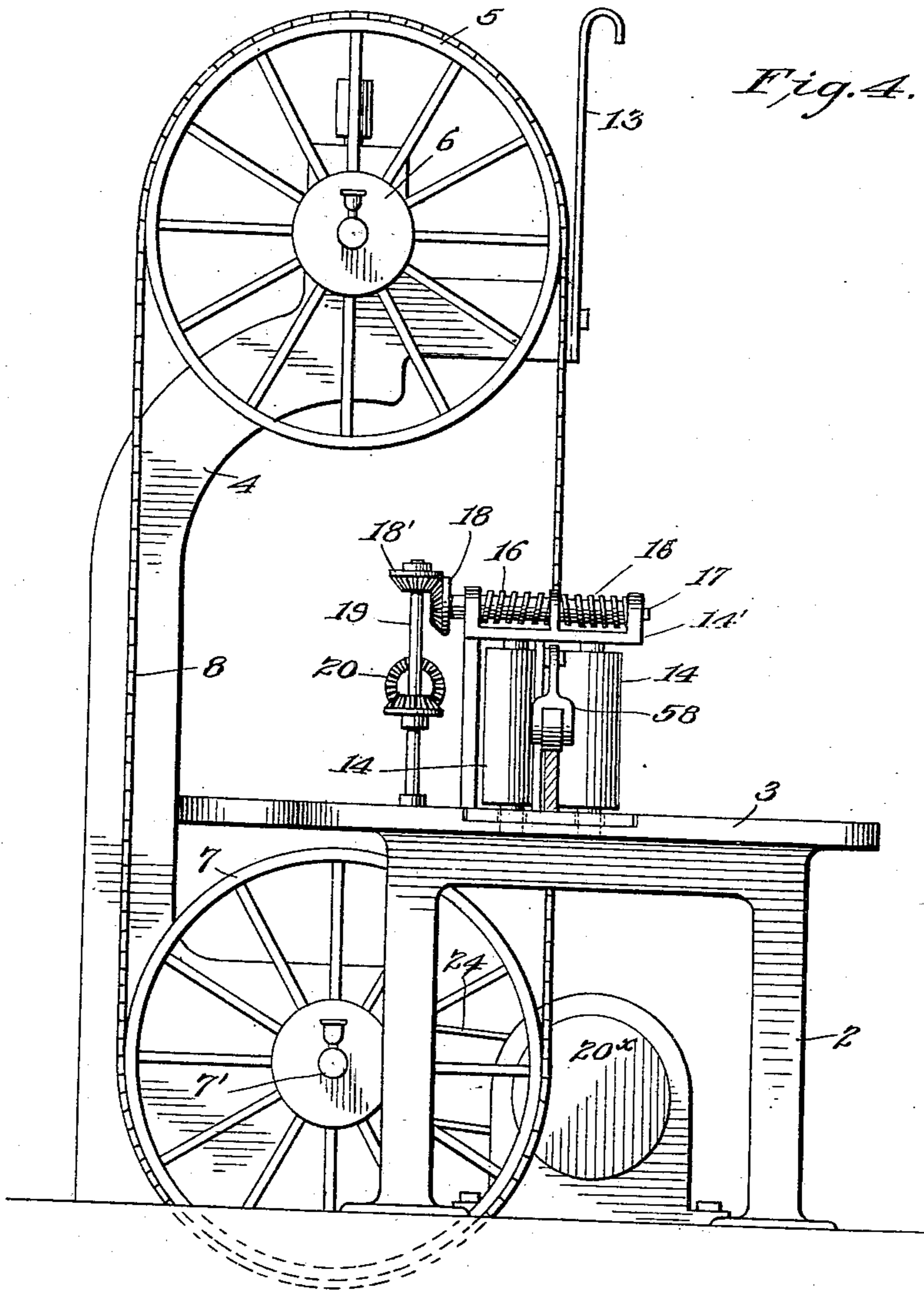
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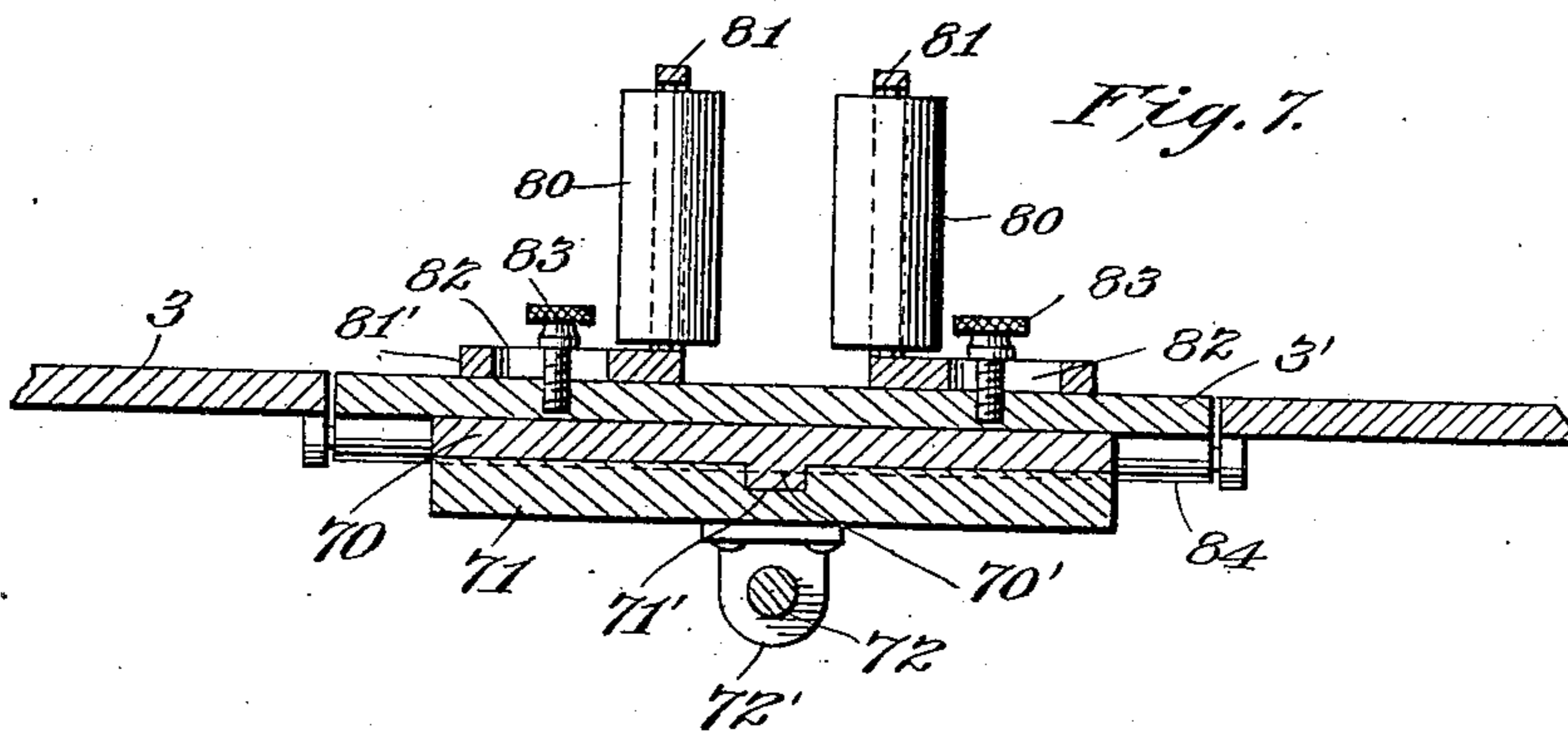
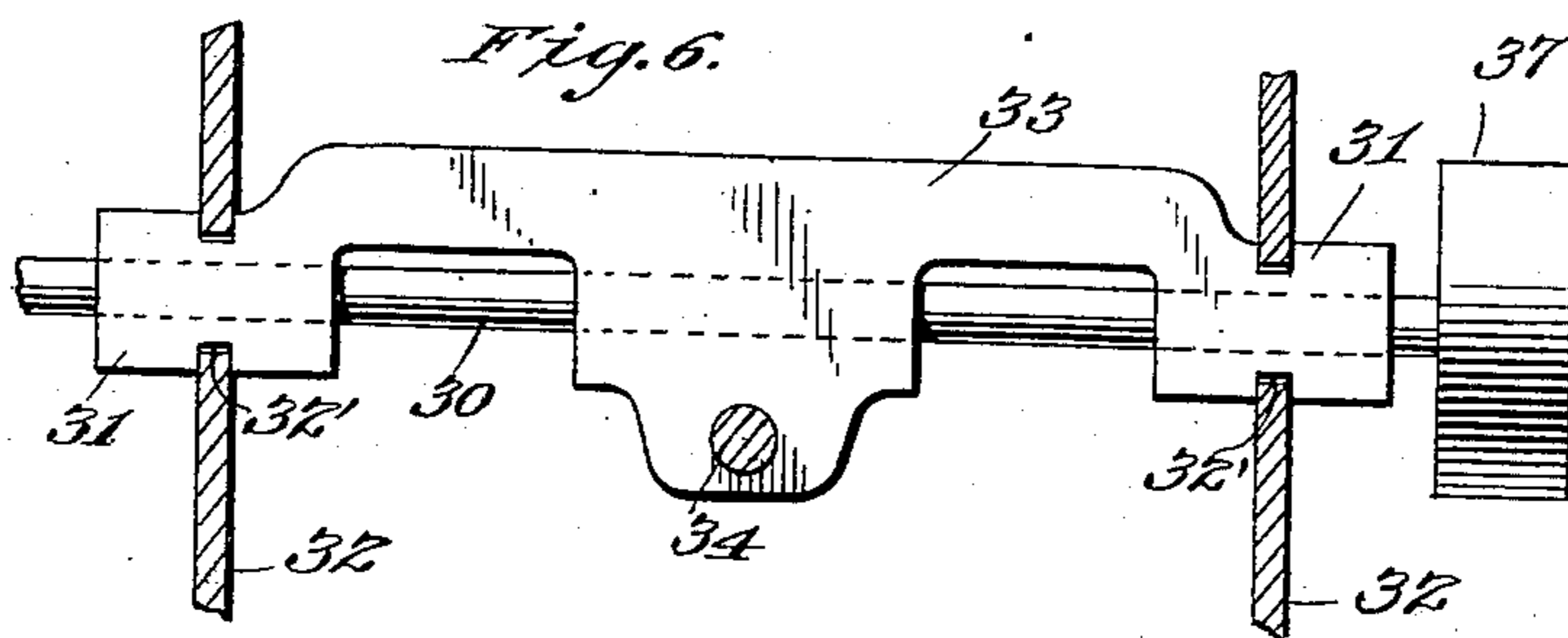
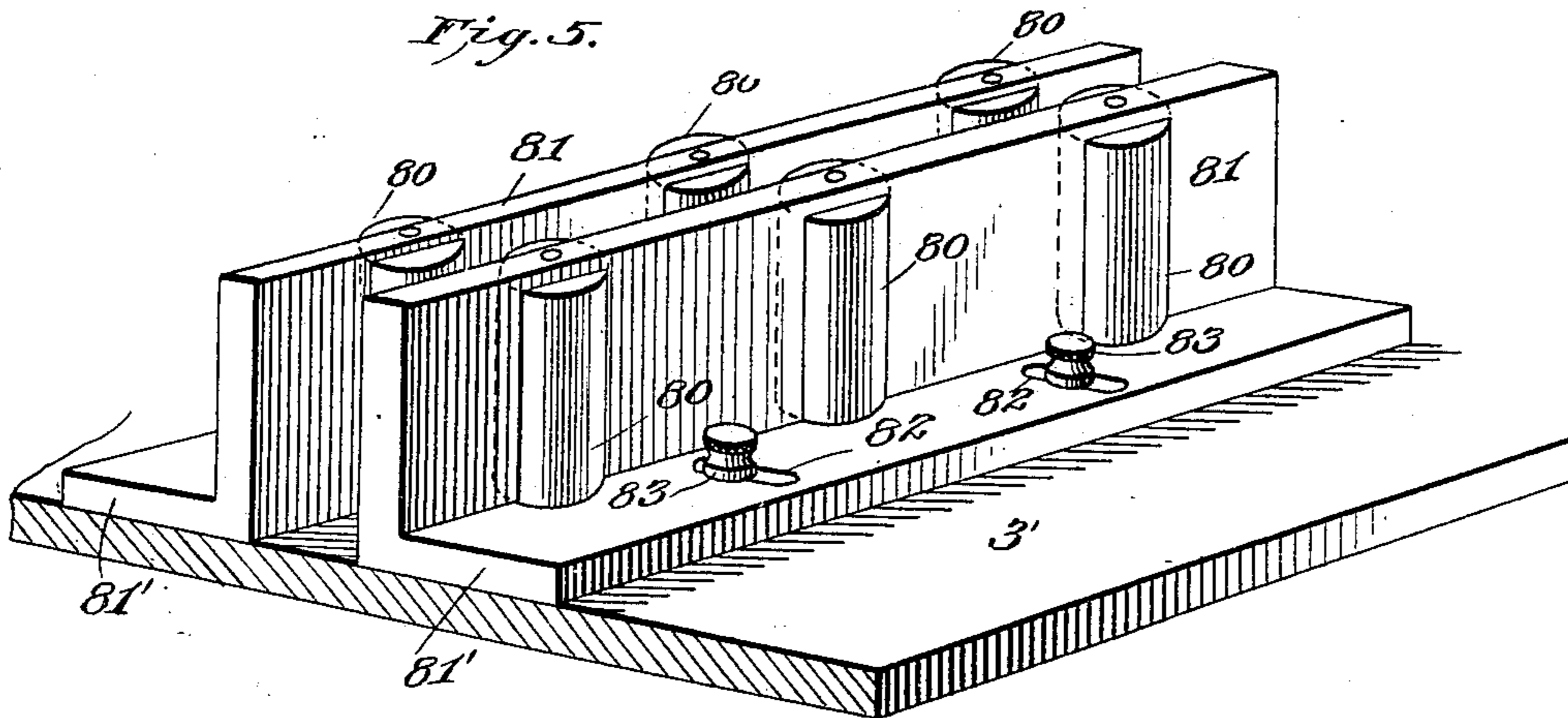
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5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

JAMES McWILLIAMS, OF CHICAGO, ILLINOIS.

BAND-RESAW AND DOUBLE JOINTER.

No. 914,746.

Specification of Letters Patent.

Patented March 9, 1909.

Application filed September 19, 1908. Serial No. 453,790.

To all whom it may concern:

Be it known that I, JAMES McWILLIAMS, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Band-Resaws and Double Jointers, of which the following is a specification.

My invention relates to wood-working machinery, and particularly to a re-sawing and edge-planing machine or jointer whereby stock may be re-sawed and the boards so cut may be planed upon their upper and lower edges, at practically one operation.

When stock is re-sawed, as in the making of siding, weather boarding, etc., the lower edges are left rough and ragged from the effects of the saw. It is not usually convenient to transfer boards so cut to a special planing machine or jointer, and hence the material so produced is defective.

The main object of my invention is to provide a machine which shall combine a band re-saw and a jointer having upper and lower rotary cutters, which as the boards pass the saw shall act upon the upper and lower edges thereof to plane or otherwise treat the same.

A further object of my invention is to feed the boards through the cutter heads of the jointer by means of the driving rolls used for feeding the stock to and past the saw, so that the boards shall be submitted to one continuous driving action from the time they enter the machine to the time they leave it.

Another object of my invention is to drive the upper and lower cutting heads by means of a new system of belting, and a novel belt tensioning mechanism which permits the boards to be set apart to any distance required through a wide range of movement without the need of readjusting the belt in any way.

A still further object of my invention is to provide means for adjusting the cutting heads relatively to each other and to adjust the table to various degrees of cut. In addition I provide means for more perfectly controlling and guiding the stock between the cutting heads from the time it leaves the saw until it has passed beyond the cutting heads.

In the accompanying drawings, forming a part of this specification wherein like characters of reference denote similar parts throughout the several views, I have shown

an embodiment of my invention in its preferred form.

Figure 1 is a front elevation. Fig. 2 is a plan view thereof. Fig. 3 is an elevation of the delivery end of the machine, the resawing portion of the mechanism being omitted for the sake of clearness. Fig. 4 is an elevation of the resawing end of the machine. Fig. 5 is an enlarged perspective view of the guide rolls and a portion of the bed plate. Fig. 6 is an enlarged fragmentary section of the cutter head adjusting mechanism. Fig. 7 is an enlarged transverse vertical section of the bed plate and guide rolls.

In the drawings 2 designates a supporting base of any desired form or construction, and 3 designates a fixed table resting on said base for a portion of its length upon which rests the bed plate 3'. A bed plate 3'' is supported rearward of the cutter heads immediately upon the base 2 in a manner which will be hereinafter described. At one end of the table is located a curved supporting column 4 having suitable bearings 6 in which an upper saw carrying wheel 5 is mounted, this wheel, of course, being adjustable in the manner usual in machines of this class. The lower saw carrying wheel 7 and its shaft 7' are supported in bearings on the base 2 in any suitable manner.

The band saw 8 passes over the upper and lower wheels and is guided and tensioned by any suitable straining mechanism. I have shown for this purpose a vertical bar 9 which is adjustable within a socketed head 10, having an adjusting set screw 10' and carried by the column 4. At its lower end the bar 9 has attached to it the horizontal bar 11 which carries any usual strainer and guide 12.

13 designates a guard carried upon a bracket projecting from the column 4. As these parts are of any ordinary construction, are well known, may be changed or varied as desired, and form no part of my invention, I have not considered it necessary to do more than refer in a general way to these constructions and to indicate them upon the drawings.

Mounted vertically upon the fixed table 3 just forward of the saw 8 are the opposed vertical feed rolls 14. These are mounted at their lower ends in bearings in the table 3 and at their upper ends in a frame 14', and are so arranged as to engage both sides of the stock being treated, and by their rota-

tion feed the stock forward against and past the saw. These rolls 14 may be of any suitable character, but I have shown them as smooth steel rollers, such as are commonly used on sawing machinery, each having at its upper end the gear wheel 15, both of said gears being driven by the oppositely inclined worms 16 on a transverse shaft 17. At its end this shaft carries a bevel gear 18, meshing with a bevel gear 18' on a vertical shaft 19, which in turn is driven by a bevel gear 20, mounted on a shaft 21. This shaft is carried in suitable bearings on the frame of the machine and is provided at its end with a belt wheel 22 over which passes a belt 22' leading to a belt wheel mounted on a counter-shaft 23, which may be driven by any suitable power as by a motor 20^x. This counter-shaft also drives the lower saw wheel 7 by a belt 24 passing from the shaft 23 to a belt wheel on the shaft 7'. While I have shown this driving arrangement for the saws and the driving rollers, I do not wish to be limited thereto as the rollers and saws may be driven in any other suitable manner without departing from the spirit of my invention, and the gearing whereby power is delivered to these rolls and to the saw may also be changed without affecting the operation of the device. At its forward end the table 3 is provided with guide rolls 80 arranged preferably on both sides of the stock so as to guide the stock between the upper and lower rotary cutter heads 27 and 28. These guide rolls will be described in detail later.

The cutter heads are of any suitable design or character, and carry the cutting knives 27''. The lower cutter head 27 is mounted on the end of the shaft 27' which rotates in bearings 29 on the base 2 of the machine, this shaft having at its rear end the belt wheel 29'. The upper cutter head is mounted so as to be vertically adjustable with relation to the lower cutter head, and this I accomplish by mounting the shaft 30 in journal boxes 31 vertically movable in guide slots 32' in a casing 32. The boxes are connected by a yoke 33 which is engaged by an adjusting screw 34 operated by a hand wheel 34'. The upper shaft 30 has on it the belt pulley.

By reference to Fig. 3, it will be seen that the belt wheels of the two cutter shafts are not in alinement with each other, but that one shaft projects out beyond the other. This is for the purpose of driving both cutters by the same belt and allowing the upper cutter shaft to be depressed or raised without changing the tension of the belt, or necessitating its being loosened or tightened. In order to keep a constant tension on the belt I provide a vertical frame 40 which is attached to the base of the machine in any suitable manner and carries at its upper end

the horizontal shaft 41. The end of this shaft is provided with a driving pulley 42 to which power is communicated from a belt wheel 43 mounted upon the counter-shaft 23 through the medium of a belt 42'. A loose pulley 23' is also mounted on the shaft upon which the belt may be shifted when it is desired to disconnect the driving pulley 42 from the wheel 43. Mounted upon the shaft 41 at one side of the frame 40 is the belt wheel 44, which is of course, rotated by the rotation of the shaft 41. 45 designates a sliding frame movable vertically in the frame 40 and held suspended by a counter-weight 46 to which it is connected by a cord 46', this cord passing over pulley 47. Mounted in the sliding frame is the shaft 48 having on it a belt wheel 49. The belt 50 as plainly shown in Fig. 3 passes over the pulley 44, then downward to and around the belt wheel of one of the cutter shafts, then up over the tension pulley, then down and around the belt wheel of the other cutter shaft, and then back to the pulley 44.

It will be obvious from the drawing and the above description that the pulley 49 simply forms an idler for the belt 50, the weight 46 drawing upward on the sliding frame and keeping a constant tension thereon. It is also apparent that by this arrangement, the cutter head may be either raised or depressed without necessitating any change in the belt 50, for the reason that the idler pulley 49 will take up any slack if the cutter head is raised and will permit the belt to be lowered if the cutter head is lowered. It will be seen that this system of pulleys is of great advantage as it permits of a very quick change in the relation of the two cutter wheels without the necessity of shifting the belt, shortening the same, and re-starting the mechanism.

In order to hold the stock down firmly upon the bed plate 3' as it passes between the cutter heads, I provide the pivoted arm 58 carrying an anti-friction roller and an arm 51 which is pivoted by a pin 52 in any one of a series of holes 53 vertically arranged in the casing 32. A weight 54 is shiftably mounted upon the arm 51 so that its pressure upon the stock may be adjusted. Projecting downward from the arm is a finger 55 which is curved downwardly and toward the cutter head, which in operation rests upon the upper edge of the boards at a point just before the point of application of the cutter head.

By means of the series of holes 53 the arm may be quickly adjusted to correspond with the adjustment of the cutter head. This I believe to be the preferable arrangement, but I do not wish to be limited thereto, as I might use a number of other means for accomplishing this end. In order to hold the boards in position after they leave the cutter

head, I have provided the vertically adjustable longitudinally extending presser bar 60 carrying anti-friction rollers 61 mounted in recesses on its under face, these rollers 5 being in constant contact with the stock as it passes through the machine. Projecting upward are the slotted guide plates 62 through the slots of which pins 63 project, these pins being fastened on a standard 64, 10 which extends upwardly from the table of the machine. Adjusting screws 65 are so connected to the plate 60 that the plate may be vertically adjusted by turning the screws. It is to be noted that there are two of these 15 screws located at opposed ends of the plate 60 so that the plate may be kept in the proper horizontal position, the upper ends of the screws being provided with hand wheels whereby they may be turned.

20 In order to regulate the depth of the cut of the lower cutter head it is necessary that the level of the bed upon which the board or stock is to move shall be adjustable vertically, and that this bed shall be made in two 25 sections, one located forward of the cutters and extending to the saw and the other rearward of the cutter. I have therefore, provided the independent bed plates 3', 3'', each independently vertically movable. In 30 order to provide for this movement I form the bed plates 3', 3'', with the wedge shaped laterally extending blocks 70 against which the wedge-shaped blocks 71 bear and act. These latter blocks are mounted to slide 35 horizontally in the standard or base 2 and have grooves 71' engaging with splines 70' in blocks 70 as shown in Fig. 7. The blocks 71 of each bed plate are horizontally moved by screws 72 which engage with a lug 72' 40 projecting downward from the lower face of each wedge 71. On turning these screws, the wedges 71 are shifted longitudinally so that they will act against the downwardly inclined faces of the wedges 70, thus wedg- 45 ing upward the bed plates 3', 3'', or allowing the same to be lowered. At its forward end the bed plate 3' is slotted for the passage of the feed rolls and the supporting frame 14' so that the bed plate may be moved 50 vertically without in any manner affecting the rolls. It will be seen of course that the bed plates 3', 3'', are independently adjustable and that each has independent adjusting screws and hand wheels 72'. It is 55 obvious from the description that by regulating the relative heights of the bed plates 3', 3'', the depth of cut of the lower cutter may be regulated to correspond.

In order to guide the stock between the 60 cutting heads, I have provided the vertical guide rolls 80. These are rotatably supported in any suitable manner in angle irons 81 as shown in detail in Fig. 5. There are two of these angular plates opposed to 65 each other, so that their respective rolls shall

engage on each side of the board as it passes the cutter head. In order that the rolls may be adjustable nearer to or farther from each other to suit various thicknesses of stock, I form the base 81' of each angle 70 plate with the slots 82 through which set screws 83 pass which engage with the bed plate of the machine. By loosening the set screws the roll carrying plates may be 75 shifted inward or outward and then set in the required position. I may also provide anti-friction rolls 84 in the bed plate for the purpose of facilitating the passage of the stock forward through the machine.

While the mechanism above described 80 is adapted for re-sawing and planing in one operation, it will be seen that it can perform either of these functions separately by either removing the saw or removing 85 the cutter heads and disconnecting the shafts from the main driving pulley.

The advantages of my invention lie in the fact that the stock is sawed and planed in one operation without the necessity of any rehandling; that only one set of feed rolls 90 is needed, the feed rolls of the re-sawing machine acting as feed rolls for the jointer as well; that the heads are adjustable relatively to each other thus providing for vary- 95 ing widths of stock, and that by driving the cutter heads with one belt for both heads, the cutter heads may be adjusted at a distance of from one to eighteen inches apart without the necessity of removing or loosening the 100 driving belt, or in any way changing it and an adjustment of the cutter heads may be made instantly, by simply operating the cutter head adjusting wheel.

Having fully described my invention, what I claim as new and desire to procure by Let- 105 ters Patent is:

1. In a machine of the class described, a table, a band saw located at one end thereof, upper and lower band wheels over which said saw passes, a driving shaft on which the 110 lower band wheel is mounted, opposed feed rolls vertically mounted on said table in advance of the saw, mechanism for driving said feed rolls from said saw wheel driving shaft, upper and lower rotatable cutter 115 heads, shafts on which the cutter heads are mounted, a driving pulley, a belt connecting both of said cutter head shafts with said driving pulley, and means for vertically adjusting the upper cutter head and mechan- 120 ism connecting the said driving pulley with the main driving shaft of the machine.

2. In a machine of the class described, a table, a band saw at one end thereof, band 125 wheels over which said saw passes, a driving shaft for rotating the lower of said wheels, opposed vertical feed rolls mounted on said table, mechanism for driving said feed rolls, a lower cutter head mounted beneath said table, an upper cutter head, a vertically ad- 130

justable shaft on which said upper cutter head is mounted, belt wheels on said shafts out of alinement with each other, a vertical standard mounted on said table, a driving pulley on the upper end of said standard having its axis at right angles with the cutter head shaft, means for driving said pulley from the saw driving shaft, a sliding frame mounted in said standard, a tension pulley on said frame, a counterweight connected to the frame tending to draw it upward, and a belt connecting the drive pulley, tension pulley and cutter head wheels.

3. In a machine of the class described, a table, a band saw located at one end thereof, upper and lower band wheels over which said saw passes, a driving shaft on which the lower band wheel is mounted, opposed feed rolls vertically mounted on said table in advance of the saw, mechanism for driving said feed rolls from said saw wheel driving shaft, upper and lower rotatable cutter heads, shafts on which the cutter heads are mounted, a driving pulley, a belt connecting both of said cutter head shafts with said driving pulley, means for keeping a constant tension on said belt and taking up slack therein, means for vertically adjusting the upper cutter head and mechanism connecting the said driving pulley with the main driving shaft of the machine.

4. In a machine of the class described, a table, a band saw at one end thereof, band wheels over which said saw passes, a driving shaft for rotating the lower of said wheels, opposed vertical feed rolls mounted on said table, mechanism for driving said feed rolls, a lower cutter head mounted beneath said table, an upper cutter head, a vertically adjustable shaft on which said upper cutter head is mounted, belt wheels on said shafts out of alinement with each other, a vertical standard mounted on said table, a driving pulley on the upper end of said standard having its axis at right angles with the cutter head shaft, means for driving said pulley from the saw driving shaft, a sliding frame mounted in said standard, a tension pulley on said frame, a counter weight connected to the frame tending to draw it upward and

a belt passing over said driving pulley, then beneath one of said cutter head belt wheels, then over said tension pulley, then beneath the other of said belt wheels, and then back to said driving pulley.

5. In a machine of the class described, a base supporting the table, a column extending upwardly from said base, a band wheel mounted on the column above said table, a band wheel mounted on the base beneath said table, a band saw passing over said wheels, a shaft mounted on the said base and connected to drive said lower band wheel, vertically opposed feed rolls mounted on said table in advance of said saw, mechanism for driving said feed rolls from the saw driving shaft, a lower cutter head beneath said table, a shaft on which it is mounted, an upper cutter head, a shaft on which said cutter head is mounted, a standard on said table having vertical guides therein, journals vertically movable in said guides and supporting the shaft of the lower cutter head, an adjusting screw connected to said journals for vertically adjusting the upper cutter head shaft, belt wheels on said cutter head shafts out of alinement with each other, a vertical frame mounted on said base, a driving pulley rotatably mounted in said frame, a counter weight connected to said sliding pulley, a belt passing around said first named pulley down under one of said cutter head band wheels, then up over said sliding pulley, then beneath the other of said cutter head band wheels and then back to said driving pulley, a weighted presser arm pivoted to the frame of the machine, adjustable vertically and having a finger bearing against the stock in advance of said cutter heads, a vertically adjustable presser plate rearward of said cutter head, and means for adjusting said presser plate vertically.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES McWILLIAMS.

Witnesses:

ZILPHA McWILLIAMS,
HELEN F. LILLIS.