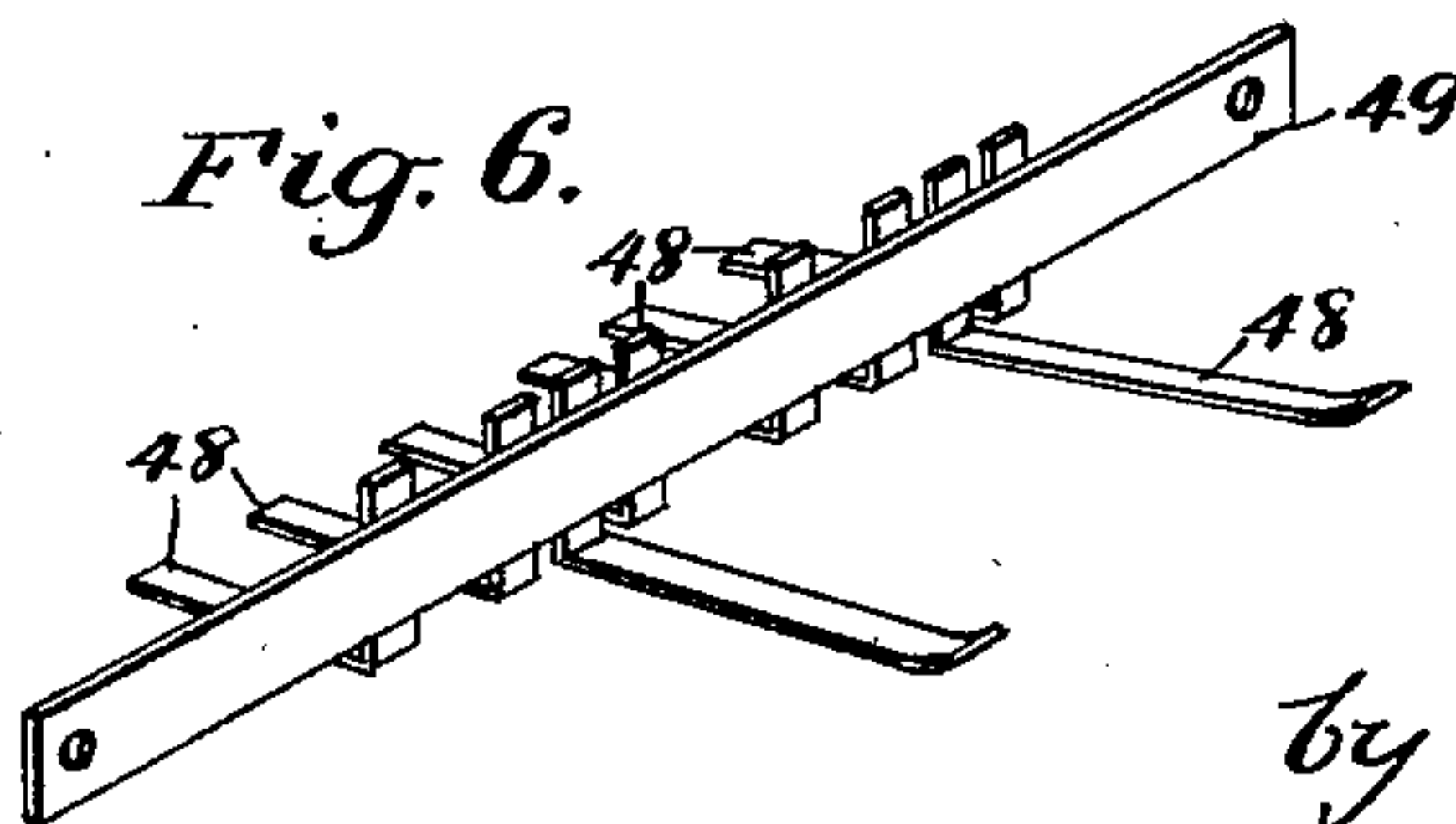
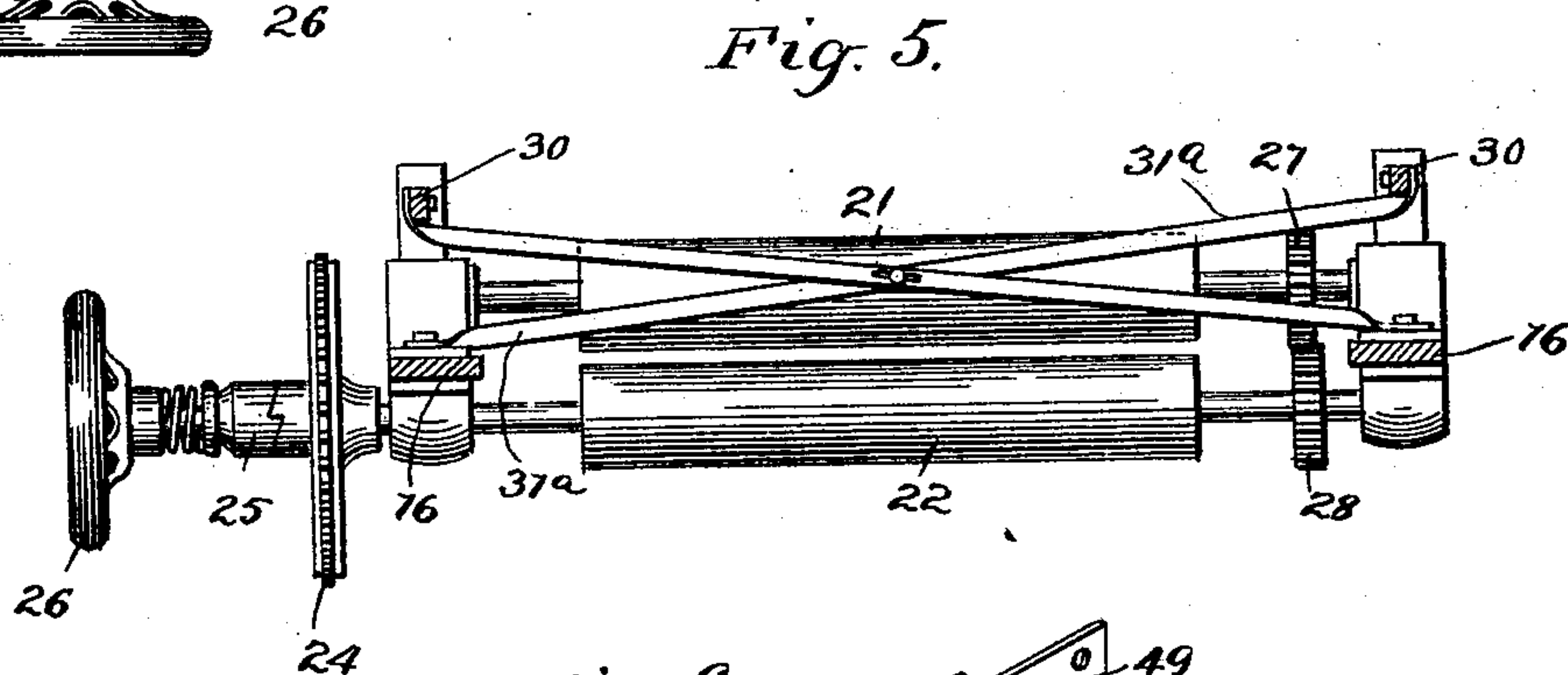
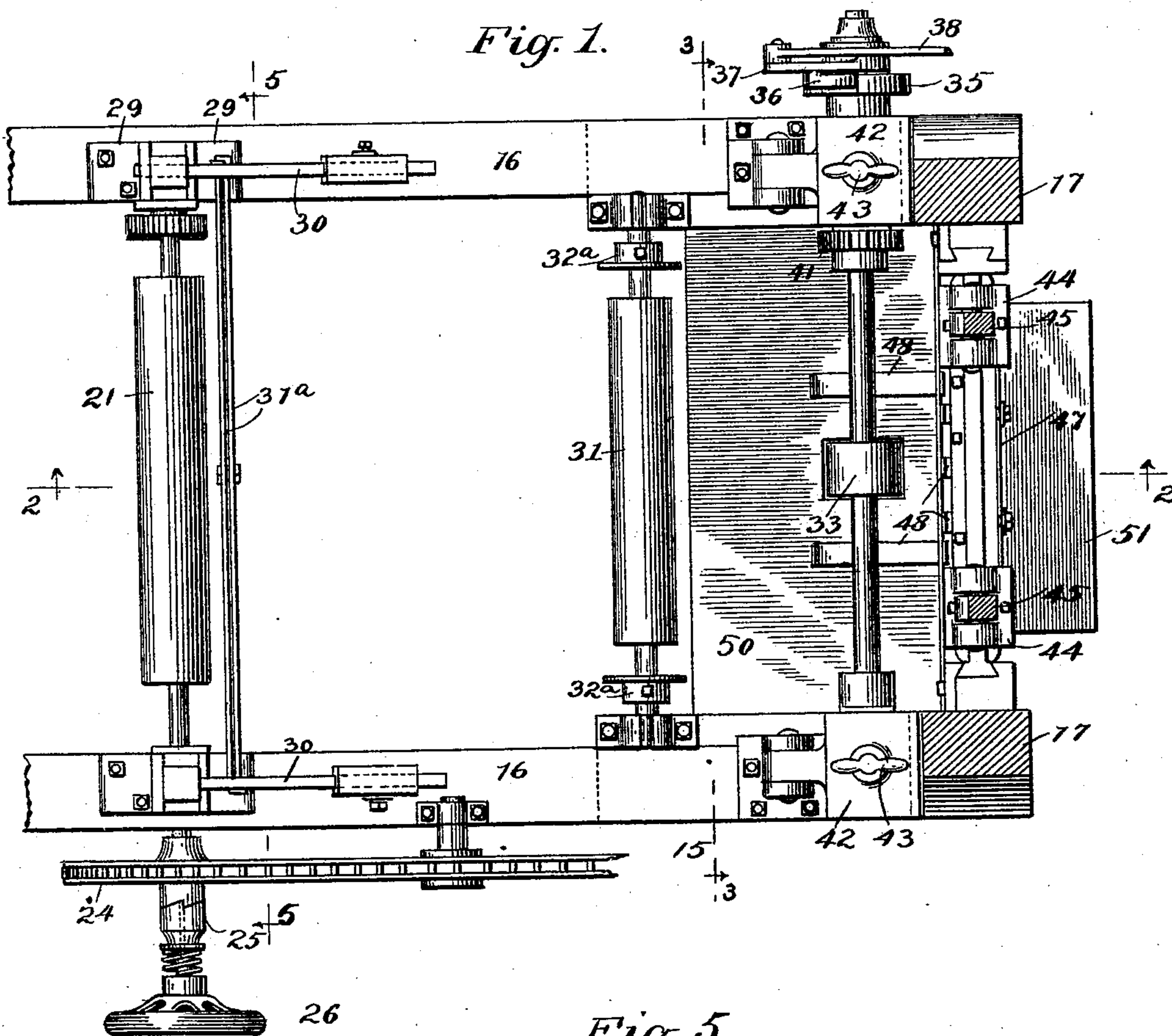


H. C. WARD.  
VENEER MORTISING MACHINE.

No. 517,558.

Patented Apr. 3, 1894.



Witnesses  
*J. E. Johnson*  
*W. R. Davis*

Inventor  
*H. C. Ward*  
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Attorneys

(No Model.)

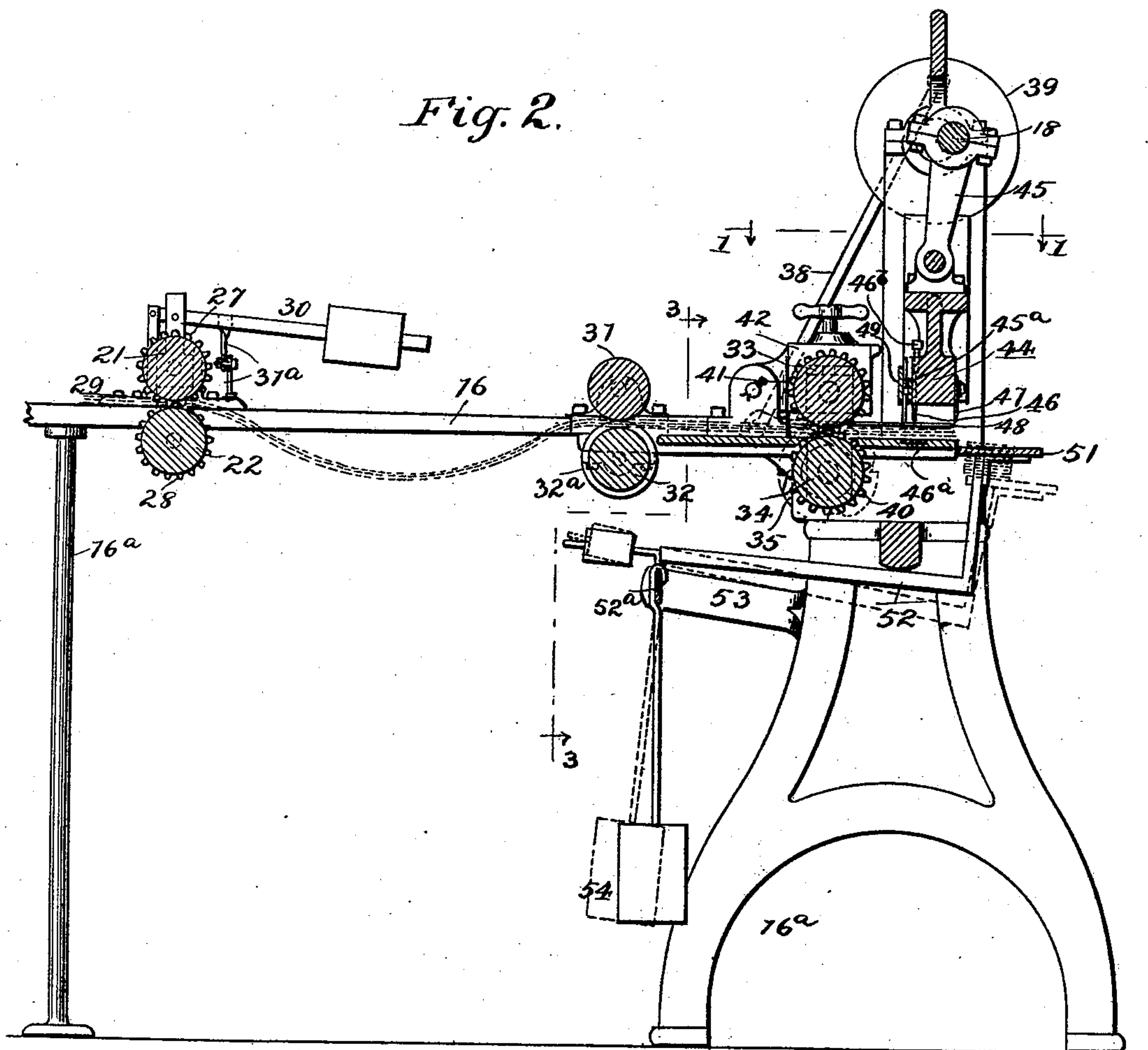
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H. C. WARD.  
VENEER MORTISING MACHINE.

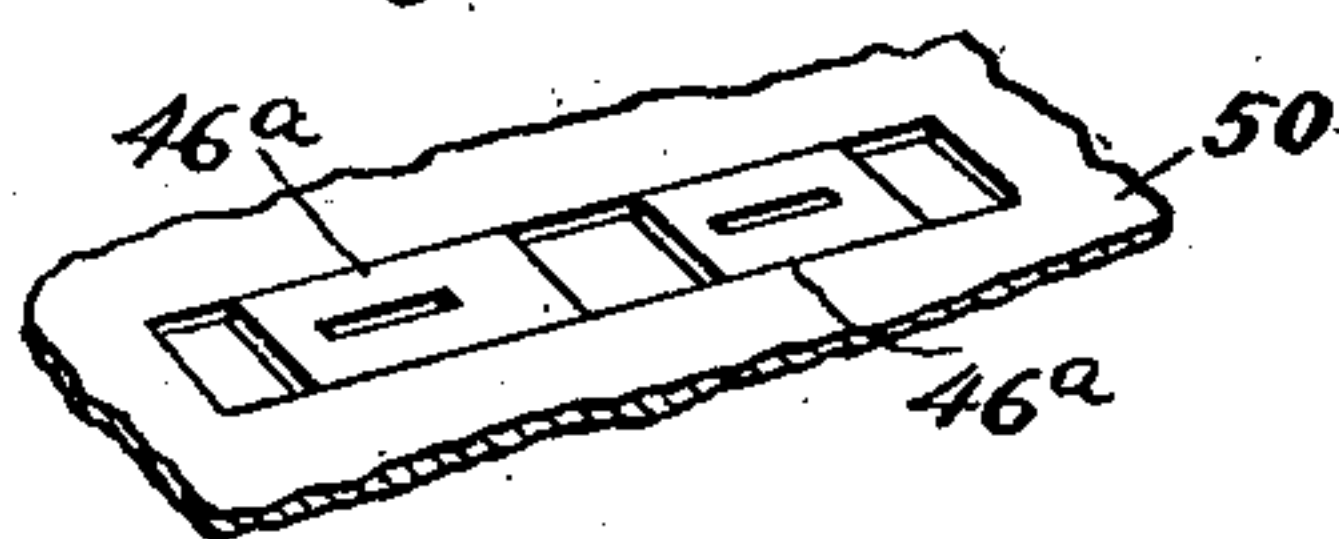
No. 517,558.

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*Fig. 2.*



*Fig. 7.*



*Fig. 8.*

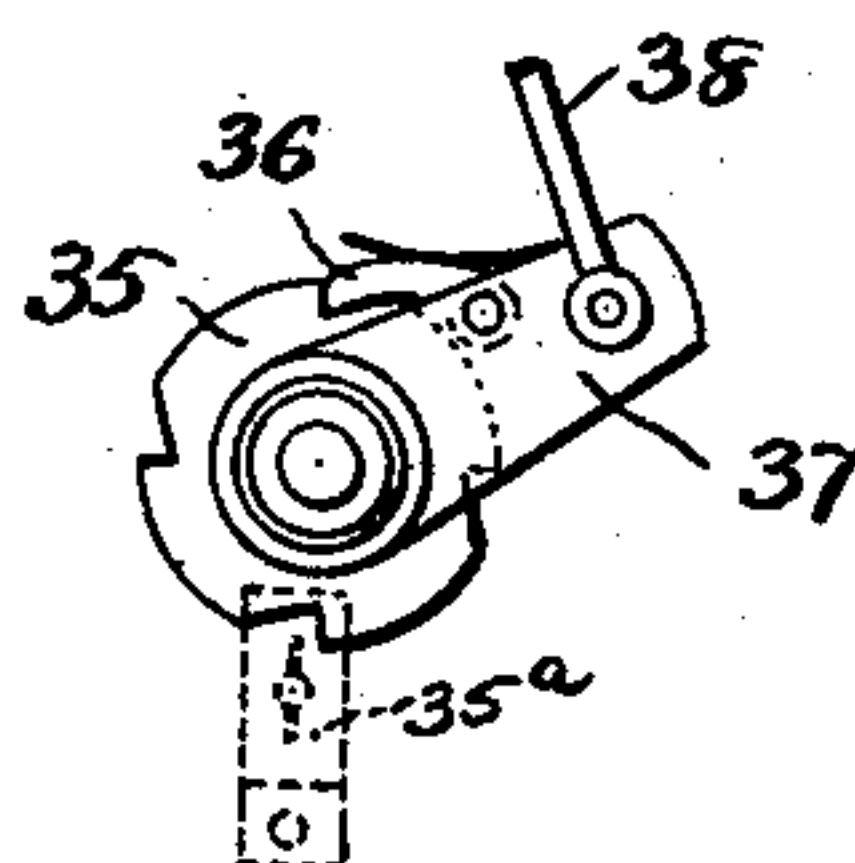
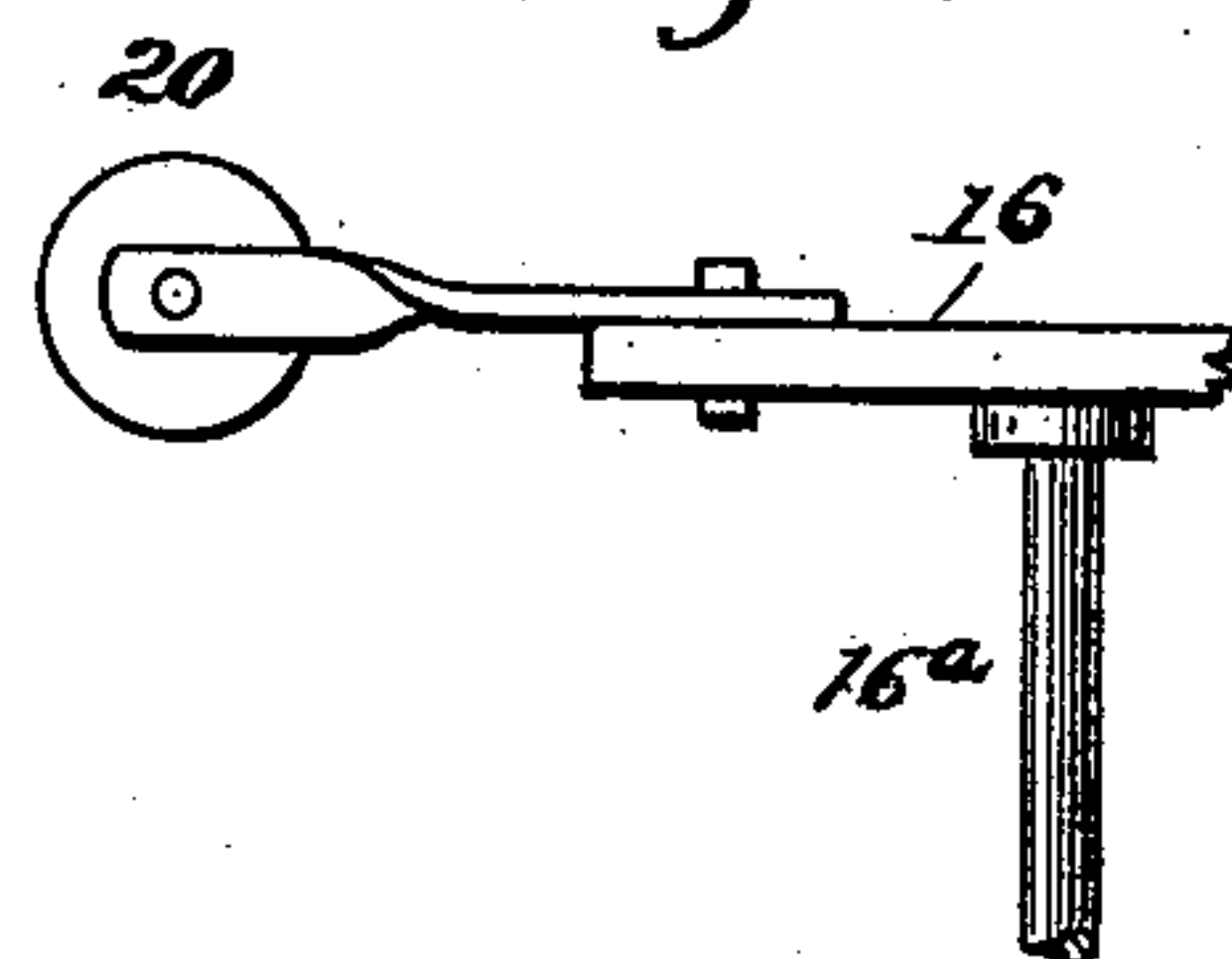


Fig. 10.

*Fig. 9.*



Witnesses

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W. R. Davis



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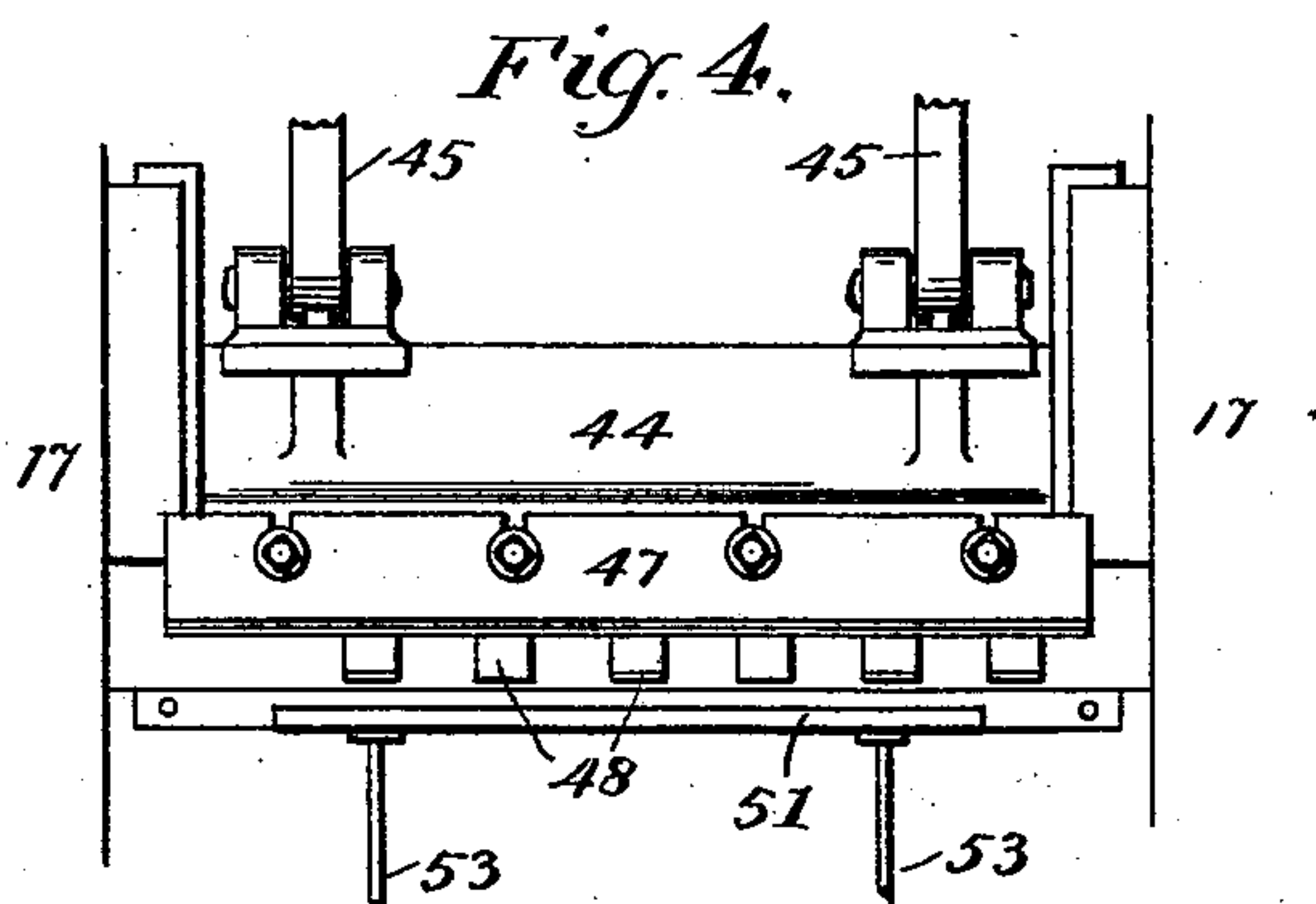
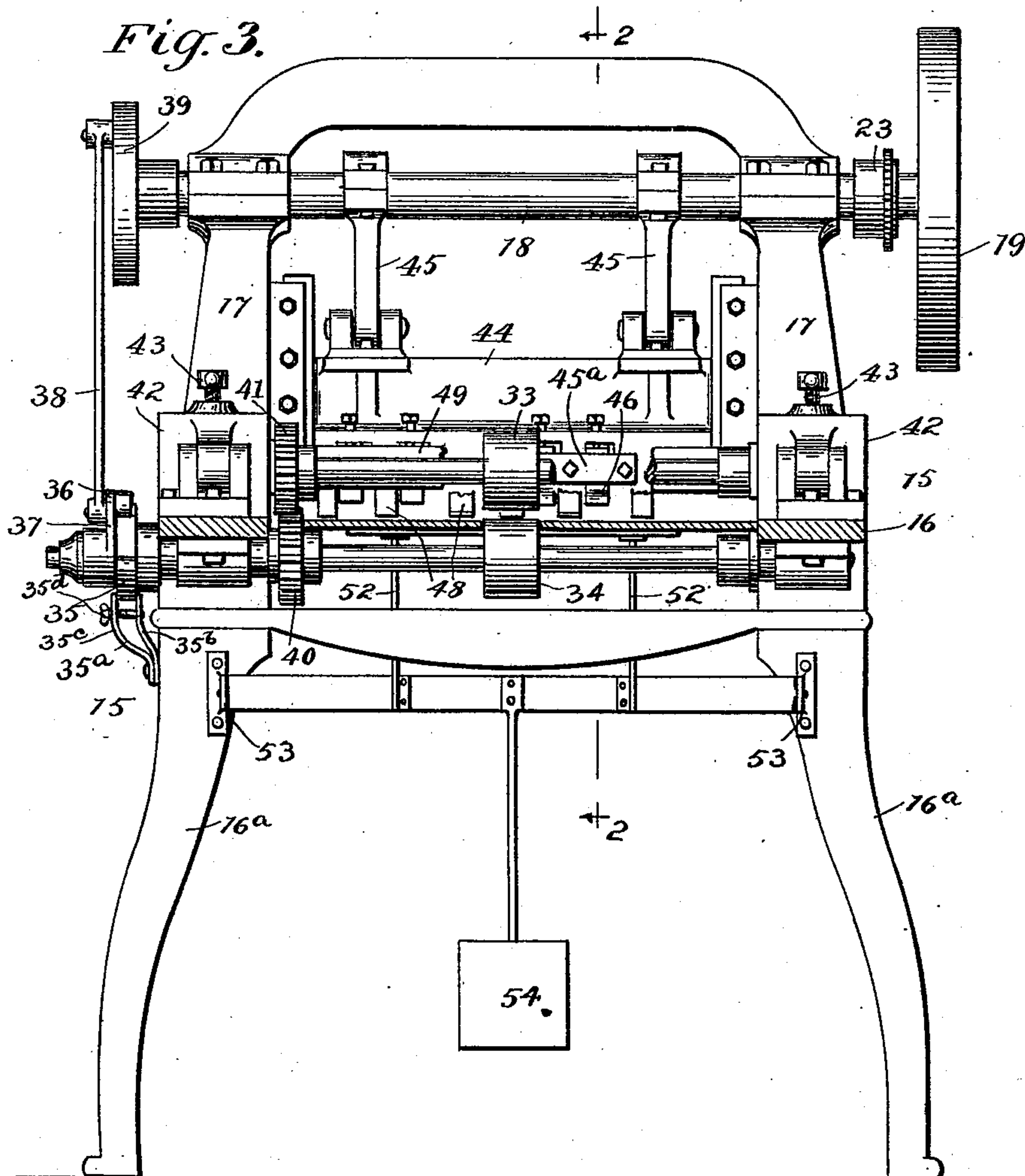
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(No Model.)

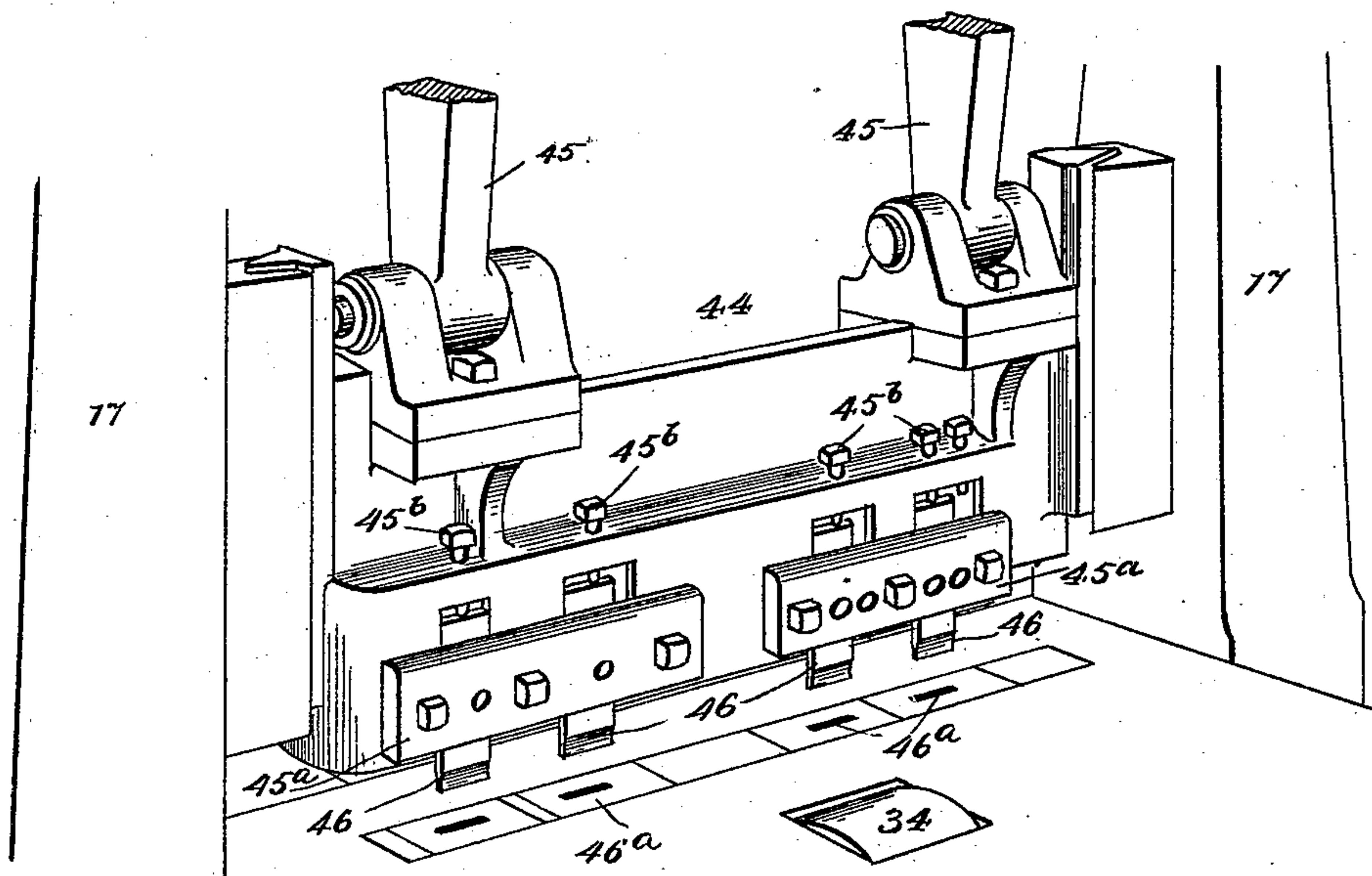
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H. C. WARD.  
VENEER MORTISING MACHINE.

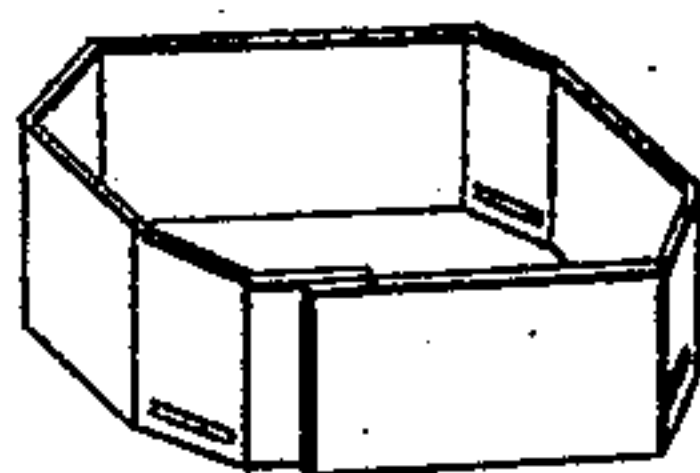
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*Fig. 4<sup>a</sup>*



*Fig. 11.*



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# UNITED STATES PATENT OFFICE.

HENRY C. WARD, OF GREENFIELD, TENNESSEE.

## veneer-MORTISING MACHINE.

SPECIFICATION forming part of Letters Patent No. 517,558, dated April 3, 1894.

Application filed July 5, 1893. Serial No. 479,628. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY C. WARD, a citizen of the United States, residing at Greenfield, in the county of Weakley and State of Tennessee, have invented certain new and useful Improvements in Veneer-Mortising Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to veneer mortising machines, and has for its object to provide a simple and effective machine which shall be capable of turning out one or more blanks or bands for fruit boxes at the same time from a sheet or series of sheets of veneers.

My invention further consists in the novel construction and combination of the several parts as will more fully hereinafter appear and then be pointed out in the claims, reference being had to the accompanying drawings and to the figures of reference marked thereon, in which—

Figure 1 is a sectional plan view of the machine, the said section being taken on the line 1—1 of Fig. 2. Fig. 2 is a longitudinal and vertical section on the line 2—2 of Figs. 1 and 3. Fig. 3 is a transverse section on the line 3—3 of Figs. 1 and 2. Fig. 4 is a rear view of the sliding head illustrating the separating knife. Fig. 4<sup>a</sup> is a perspective view of the sliding head illustrating the means for adjusting and securing the mortising cutters; Fig. 5 a detail view of front feed-rolls. Fig. 6 is a perspective view of the fingers; Fig. 7 a detail perspective view of the dies; Fig. 8 a mechanism for operating the intermittent feed-rolls. Fig. 9 is a detached view of the front roll. Fig. 10 is a view of the blank when finished. Fig. 11 is a perspective view of the blank or band when bent in the shape of the body of the fruit-box.

In the drawings 15 is the frame suitably mounted upon the uprights 16<sup>a</sup> and comprising the longitudinally-extending bars 16 and the standards 17. The standards 17 have journaled at the upper portion thereof a crank-shaft 18 which has secured at one of its ends a drive-pulley 19. At 20 is an idle roller, shown detached in Fig. 9, which is journaled in brackets secured to the bars 16 of the frame, and over which the sheets of

veneers pass from a suitable frame located in front thereof, but not illustrated in the drawings. The sheets of veneers, preferably three in number and placed one on top of the other, are engaged by the front feed-rolls 21 and 22 after passing over the roller 20. The lower feed-roll 22 is journaled in bearings secured to the bars 16 and receives a continuous rotary motion from a sprocket chain engaging a sprocket wheel 23 on the crank-shaft 18, and the sprocket wheel 24 of the shaft of the feed-roll 22 shown in Figs. 1 and 3. The sprocket wheel 24 is loosely held upon the shaft of the feed-roll 22 and is provided with clutch jaws on the face of its hub, which jaws are engaged by a spring-pressed clutch collar 25 slidingly held on the shaft of the feed-roll 22 by means of a key and keyway. At 26 is a wheel secured to the shaft of the feed-roll 22 and by means of which movement may be given to the feed-roll by hand when the clutch collar 25 is disengaged from the sprocket or drive wheel 24. The upper feed-roll 21 is given movement by means of gears 27 and 28 secured to the respective shafts. This roll is journaled in boxes slidingly held in brackets 29 which are secured to the bars 16 of the frame, the said boxes being pressed downwardly by the weighted levers 30, secured to the boxes and having their fulcrum in the bracket. The levers 30 are connected by cross-bars 31<sup>a</sup> secured to each other at their centers and at their ends to the weighted levers 30 and the bars 16 respectively. This arrangement not only allows of an automatic adjustment of the front feed-rolls but allows both levers 30 to be raised at the same time and from either side of the machine. The sheets of veneers after leaving the front feed-rolls pass between the idle rolls 31 and 32, which are journaled upon the frame, the former of which rests in bearings located upon the bars 16. The idle roll 32 is provided with adjustable flanges 32<sup>a</sup> which serve to guide the veneers in a straight course and both idle rolls serve to keep the sheets in their proper relative positions one to the other before or while being engaged by the intermittent feed-rolls, as will presently appear. From the idle rolls the veneers pass between the intermittent feed-rolls 33 and 34, by which they are engaged and fed under the sliding head to be mortised the said rolls be-



ing preferably made much narrower than the width of the veneers to prevent crimping of the sheets at their edges. The lower feed-roll 34 is journaled in boxes located in slots 5 in the sides of the frame and has secured to the end of the shaft thereof, a ratchet wheel 35, which ratchet wheel is engaged by a pawl 36 carried by an arm 37 which is loosely mounted on the shaft and which receives an oscillating motion through a pitman 38 connected to the said arm and to the crank-disk 39, which disk is secured to the crank-shaft 18. At 35<sup>a</sup> is a friction device comprising two pieces of spring metal 35<sup>b</sup> and 35<sup>c</sup> clamped together by the thumb-screw 35<sup>d</sup>, and secured at one of their ends to the side of the machine and engaging with the other end the faces of the ratchet wheel 35 for giving more friction to same when drawn together by the thumb-screw 35<sup>d</sup> to prevent any backward movement of the feed-rolls. The movement of the feed-rolls is sufficient to feed the veneers forward equal to the width of the blank to be mortised. The lower feed-roll 34 has a gear 40 secured to its shaft which meshes with a spur gear 41 secured to the shaft of the roll 33 and through which the same rate of movement is given to both rolls. The upper roll 33 is also journaled in boxes which are carried in pivoted journal bearings 42 located one on each side of the frame, the said journal bearings being pivoted to brackets secured to the frame which will allow the upper feed-rolls to be thrown backward to allow free access to the mortising cutters referred to hereinafter. The boxes are adjustable within the journal bearings by means of the screw 43 engaging the boxes and the whole journal bearing, through the roll 33, will yield to any uneven surface of the veneer sheets.

The standards 17 are provided with guides in which is slidingly held the head 44 which is connected to the cranks of the shaft 18 by the connecting rods 45. At 46 are the mortising cutters best illustrated in Fig. 4<sup>a</sup> which correspond to the number of mortises desired to be placed in the blanks which as shown consists of four. These cutters are secured to the sliding head 44 by means of the cross-bars 45<sup>a</sup> which clamp them rigidly to the head. The cutters have a vertical adjustment through the set-screws 46<sup>b</sup> and are also provided with a lateral adjustment by means of the cross-bars 45<sup>a</sup>, and the space allowed for same in the head 44, the said bars serving to rigidly clamp the cutters against the head when properly adjusted. To the rear of the head is adjustably secured the separating knife 47, by means of bolts or their equivalents, the said knife serving to separate the blanks from the sheets as the head descends and at the same time that another set of blanks is being mortised by the cutters 46. Below the cutters 46 and adjustably arranged are the dies 46<sup>a</sup>, shown in Fig. 8, which are adapted to be in alignment with the cutters 46 so that the cutting ends

of the cutters may pass into the openings in the dies for cutting a smooth mortise in the sheets. At 48 are fingers, best shown in Fig. 6, which are secured to a cross-bar 49 bolted to the standards 17 of the frame. Several of these fingers extend between the mortising cutters and nearly to the separating knife 47, while others project forwardly to each side of the intermittent feed-rolls, the said fingers serving not only to keep the sheets of veneers upon the table 50, but also to prevent the mortising cutters from lifting same from the table while the cutters are being withdrawn, otherwise the sheets might be broken or injured. At 51 is the receiving table which has the L-shaped arms 52 extending therefrom and which are secured to a cross-bar 52<sup>a</sup> pivoted to brackets 53 located on the uprights 16<sup>a</sup> of the machine. This table receives the blanks as they are separated from the sheets and as the blanks collect thereon their weight lowers the table as shown in dotted lines in Fig. 1 so that the blanks, shown in Fig. 10, may be readily removed without being disarranged. The arms of the table are provided with counter-balances 54, so that the table shall always be in the proper position for receiving the blanks, the counterbalance being of sufficient weight to merely balance the weight of blanks as they collect on the table.

In operation the sheets of veneers are passed from a suitable frame, over the roll 20, to the feed-rolls 21 and 22, from which they pass between the idle rolls 31 and 32 to the intermittent feed-rolls 33 and 34, as shown in dotted lines in Fig. 2. The continuous rolls are so arranged as to start feeding before the intermittent feed-rolls, enough sooner to allow the stock or sheets of veneers to sag or bulge between the set of continuous feed-rolls and the idle rolls. Exactly the same amount of material passes between the two sets of feed-rolls in the same period of time; but the intermittent rolls merely take up in part the slack material which has already been fed by the continuous feed-rolls. It will be seen that there will always be some slack material, and that the intermittent rolls will never gain sufficiently on the continuous rolls as to cause a strain on the material which would tend to break it in two. By the action of the feed-rolls, as just described, only sufficient of the sheets of veneers are fed under the sliding head as will form a blank or set of blanks according to the number of sheets. The head then descends and separates a set of blanks from the sheets, at the same time, by means of the cutters 46, another set of blanks are mortised, the separated set of blanks being deposited upon the receiving table 51, from which they are removed at will.

It will be understood, of course, that the rolls 21 and 22, when rotated continuously, revolve at such a speed that only sufficient of the sheets of veneers are fed by them, while the intermittent rolls are stationary, that



when the intermittent rolls are operated the continuous and the intermittent rolls together will only feed enough under the sliding head to form a blank or series of blanks, according to the number of sheets used at the same time.

It will be noticed that in providing for a continuous rotary motion of the front feed-rolls, I also provide means for turning same by hand, by which means either a faster or slower feed may be obtained, or a motion that is not continuous if desired; and I wish it distinctly understood that I may vary in other ways some parts of the machine without departing from the spirit of my invention.

It will be observed that the essential feature of this invention lies in the manner of drawing the veneer from the roll at the front of the machine and feeding it to the cutters. The initial rolls draw or unwind the veneer-band or strip from the supply roll with a slow and non-intermittent movement, thereby causing a continuous slack or sag to be maintained between the initial rolls and the intermittent feed-rolls, the latter rolls drawing their supply intermittently from the sagging portion of the veneer strip. The strain the stock is subjected to by the intermittent feed-rolls is not severe enough to injure the same, since these feed-rolls draw their supply from the sagged portion of the stock drawn off from the supply-roll by the continuous feed. The great advantage of these peculiar feeding devices is that the liability of parting or breaking the stock in drawing it from the supply-roll is reduced practically to *nil*, since the stock is not subjected to such severe strains as would occur were an intermittent initial feed employed to take the material from the supply roll.

It has been found in practice that an intermittent mechanism for initially drawing the material from the roll, however brief be the intervals between the successive jerks or pulls, subjects the stock to longitudinal strains sufficiently severe to frequently part the same, especially where large rolls of veneer are used. This will be readily understood when it is remembered that stock of this character is usually so thin and flimsy that in working it, even in the present machine, it is usually necessary to superimpose several layers of the veneer, one upon the other.

Having thus fully described my invention, what I claim is—

1. The combination with a frame, of a set of feed-rolls located upon the frame and means for operating said rolls, the upper roll of said set being journaled in boxes yieldingly held upon the frame, levers pivoted to brackets upon the frame and connected to the boxes in which the roll is journaled, cross-bars 31<sup>a</sup> each connected at one of their ends to the brackets and at their other ends to the levers and to each other at their centers, whereby both sides of the roll may be lifted at the same time, substantially as described.

2. The combination with a frame of a set of feed-rolls located and journaled upon the frame and placed one above the other, and so connected as to rotate in unison the upper roll being carried in boxes adjustably held in journal bearings which bearings are pivoted in brackets located upon the frame, the lower feed-roll having devices for giving it an intermittent motion, substantially as described.

3. The combination with a frame, of a set of feed-rolls located and journaled upon the frame and placed one above the other, the upper roll being carried in boxes adjustably held in journal bearings, which bearings are pivoted in brackets located upon the frame, the lower feed-roll having a ratchet wheel secured to the shaft and an arm carrying a pawl adapted to engage the teeth in the ratchet wheel, the said pawl carrying arm being loosely mounted upon the feed roll shaft and provided with means for oscillating same, both feed-rolls being so connected as to rotate in unison, substantially as described.

4. The combination with a frame, of a set of feed-rolls located and journaled upon the frame and placed one above the other, the said rolls being narrower than the width of the material which passes between the same, the upper roll being carried in boxes adjustably held in journal bearings which bearings are pivoted in brackets located upon the frame, the lower feed-roll having a ratchet wheel secured to the shaft, and an arm carrying a pawl adapted to engage the teeth in the ratchet wheel, the said pawl carrying arm being loosely mounted upon the feed-roll shaft and provided with means for oscillating same, both feed-rolls having a spur gear secured to each shaft and which engage each other, whereby both feed-rolls may rotate in unison, substantially as described.

5. The combination with a frame, of a receiving table having an L-shaped arm secured at one of its ends to the under side of the table the other end being secured to a cross-bar pivoted to brackets arranged upon the frame, the said cross-bar being provided with a counter-balance, whereby the said table will yield when weight is placed thereon, substantially as described.

6. The combination with a feed-roll properly journaled in a frame and carrying a ratchet wheel at one of its ends, of a frictional device comprising two pieces of suitable material secured at one of their ends to frame and engaging at their other ends the opposite faces of the ratchet wheel, and means for drawing the two pieces together whereby different degrees of friction may be secured, substantially as described.

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

HENRY C. WARD.

Witnesses:

A. D. KENT,  
JNO. D. TOSH.