

No. 621,488.

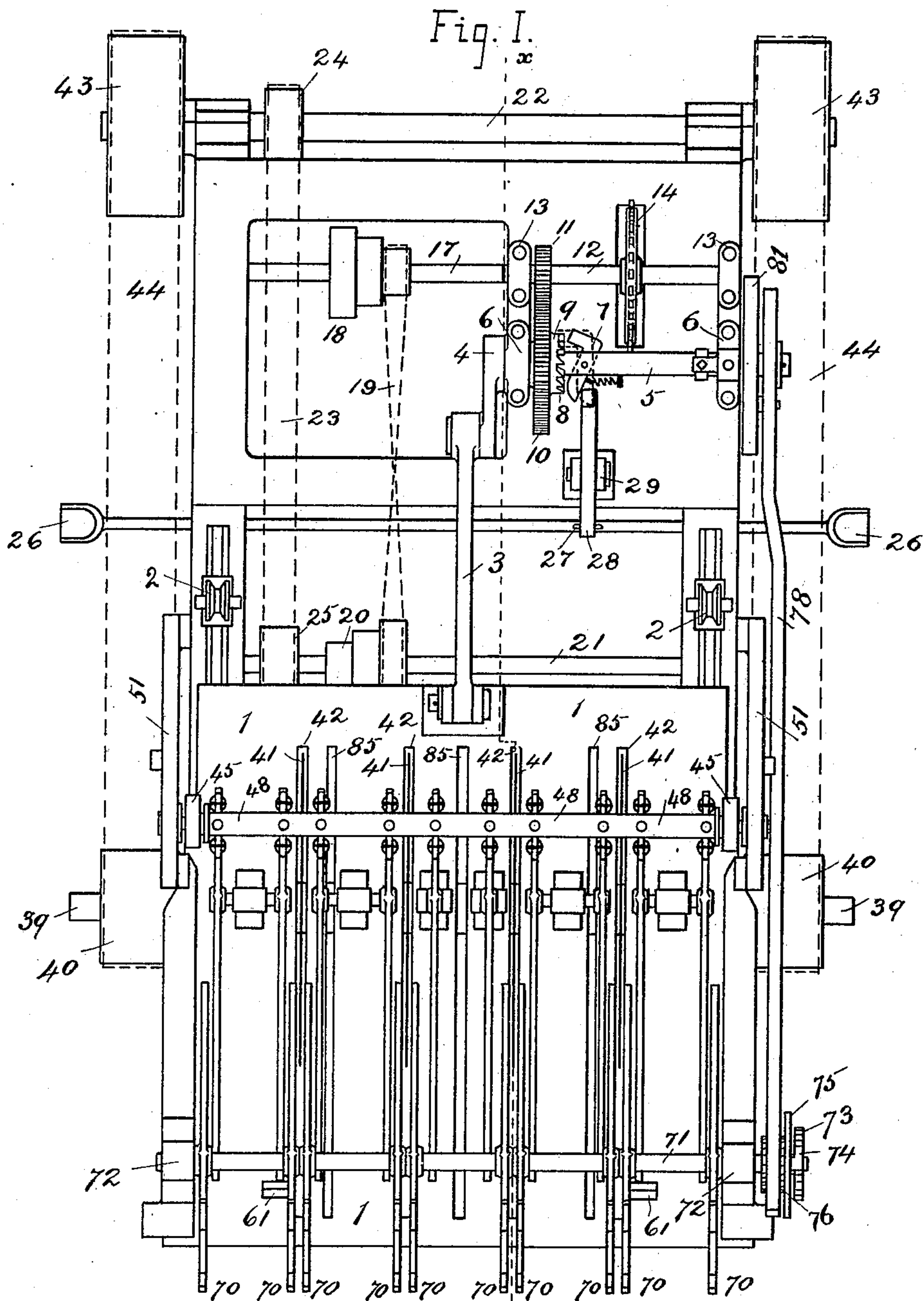
Patented Mar. 21, 1899.

E. S. CLARKE.
SAWING MACHINE.

(No Model.)

(Application filed May 24, 1898.)

5 Sheets—Sheet 1.



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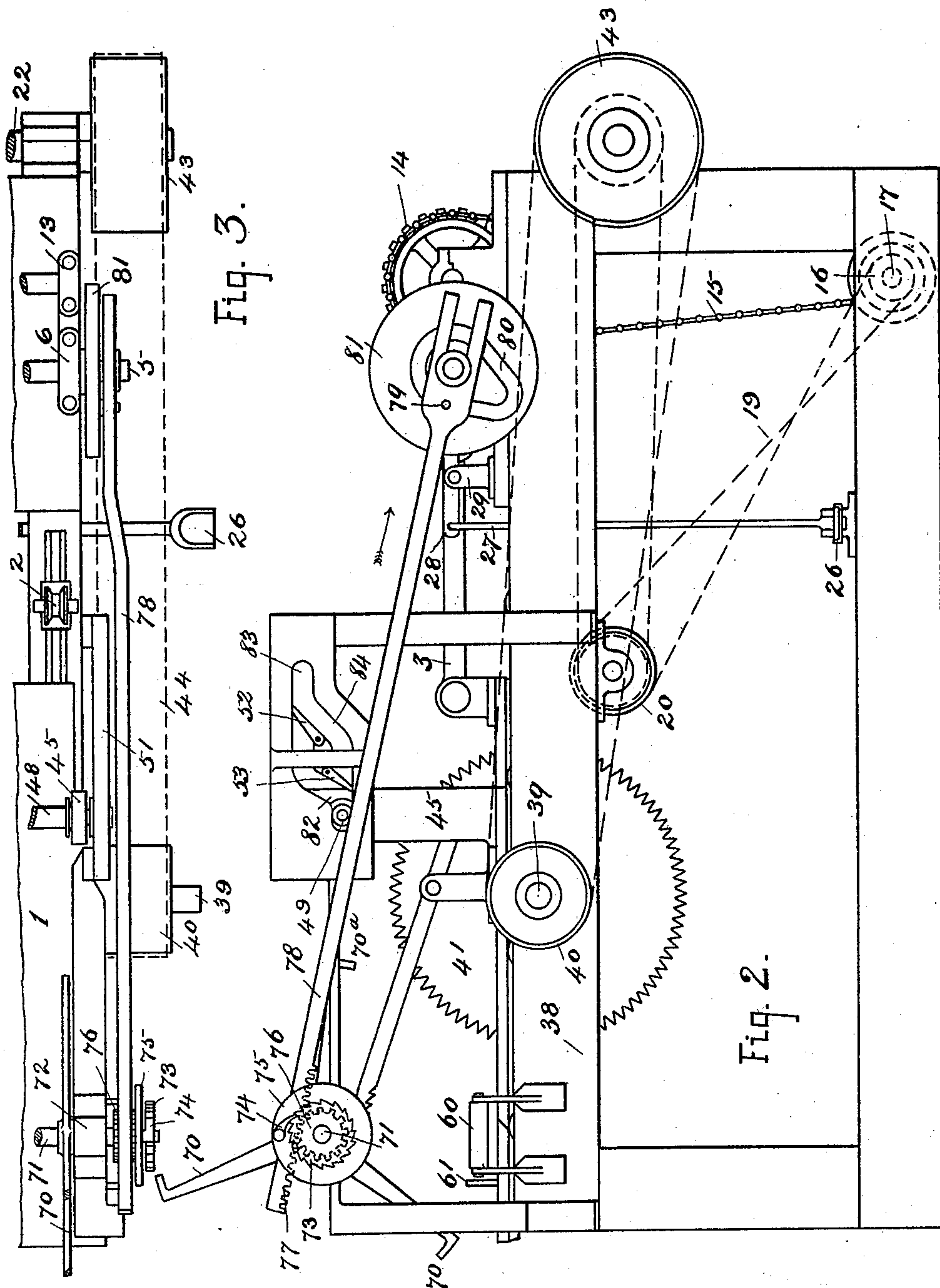
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5 Sheets—Sheet 2.



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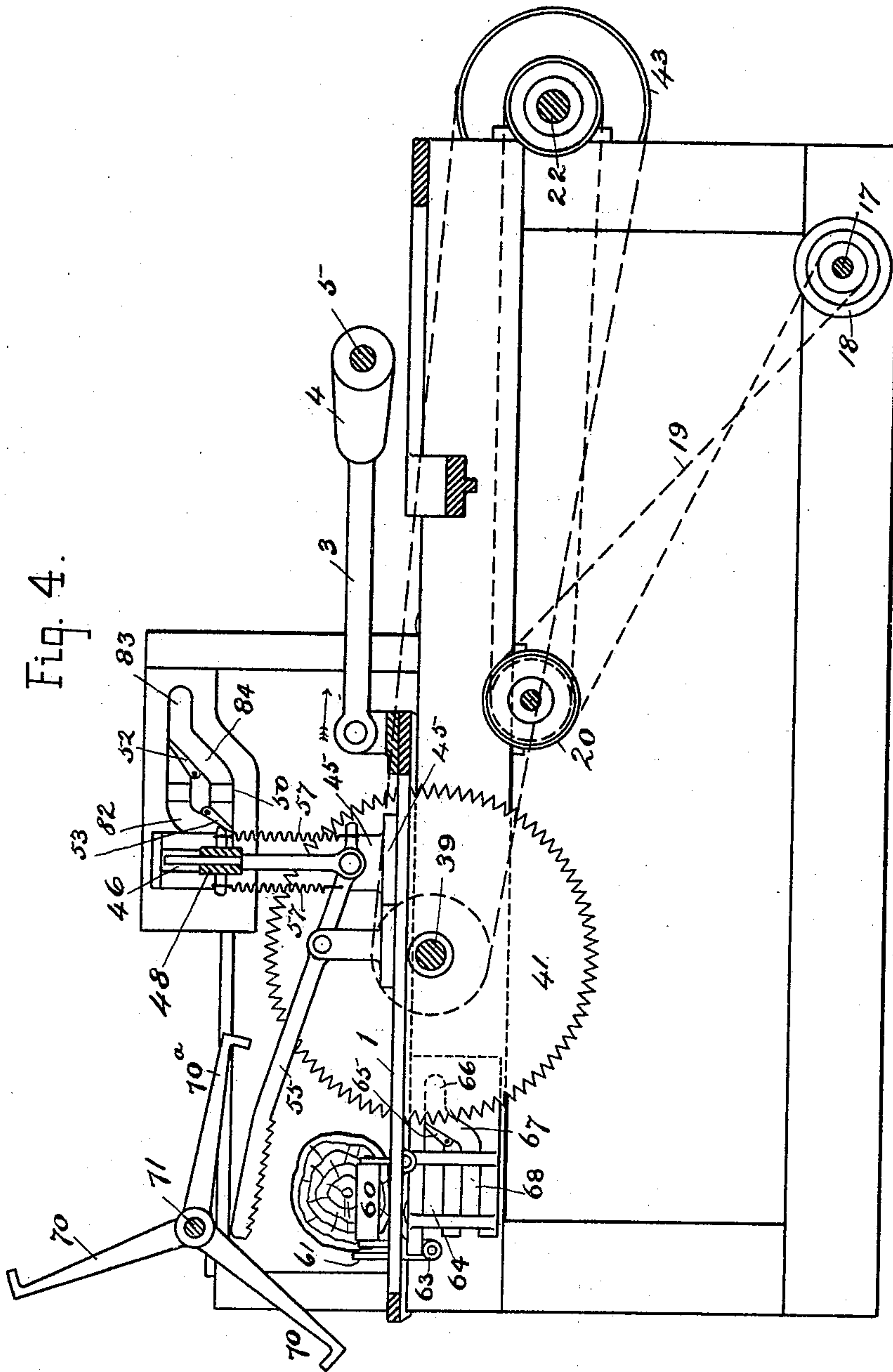
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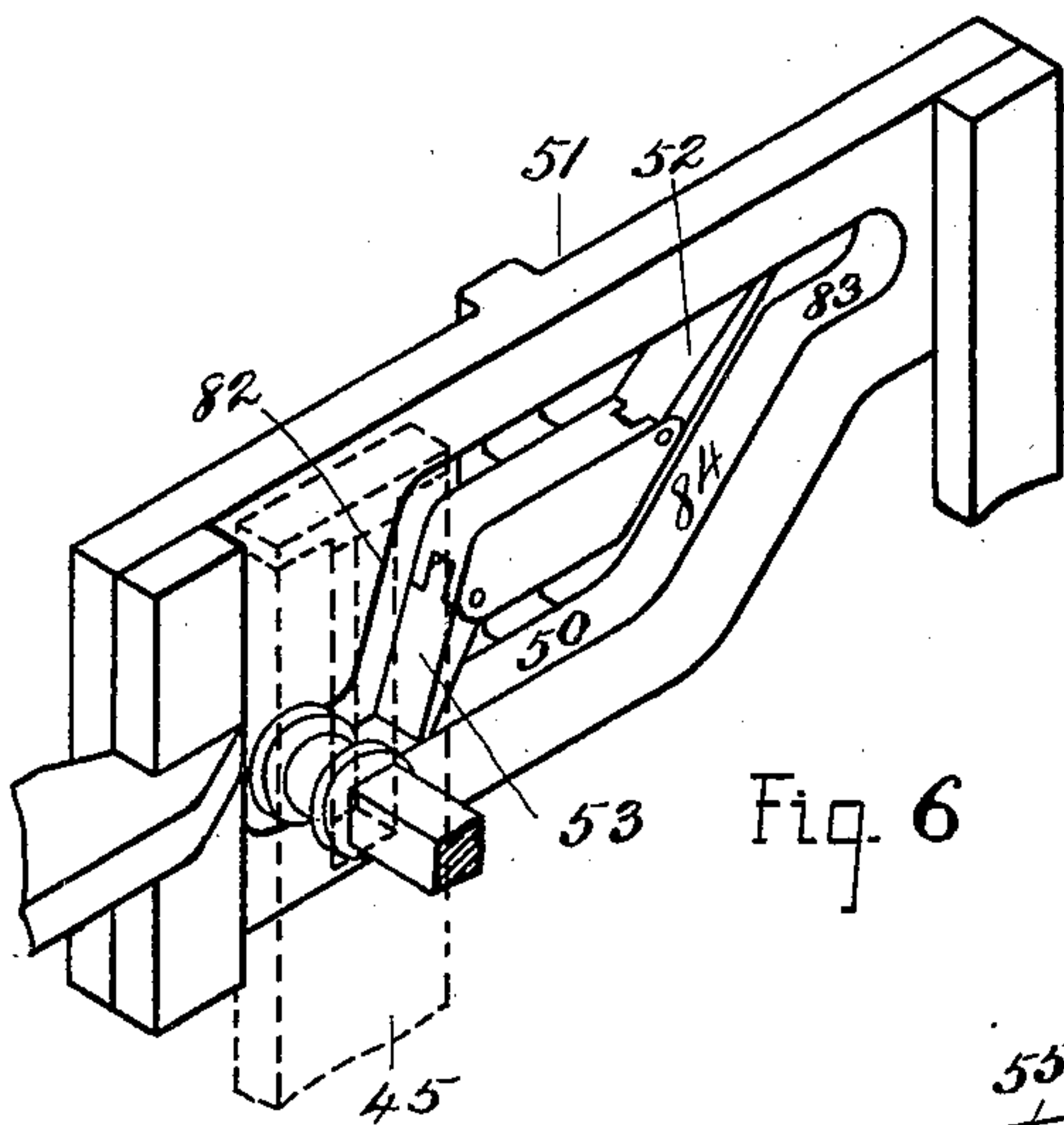


Fig. 6

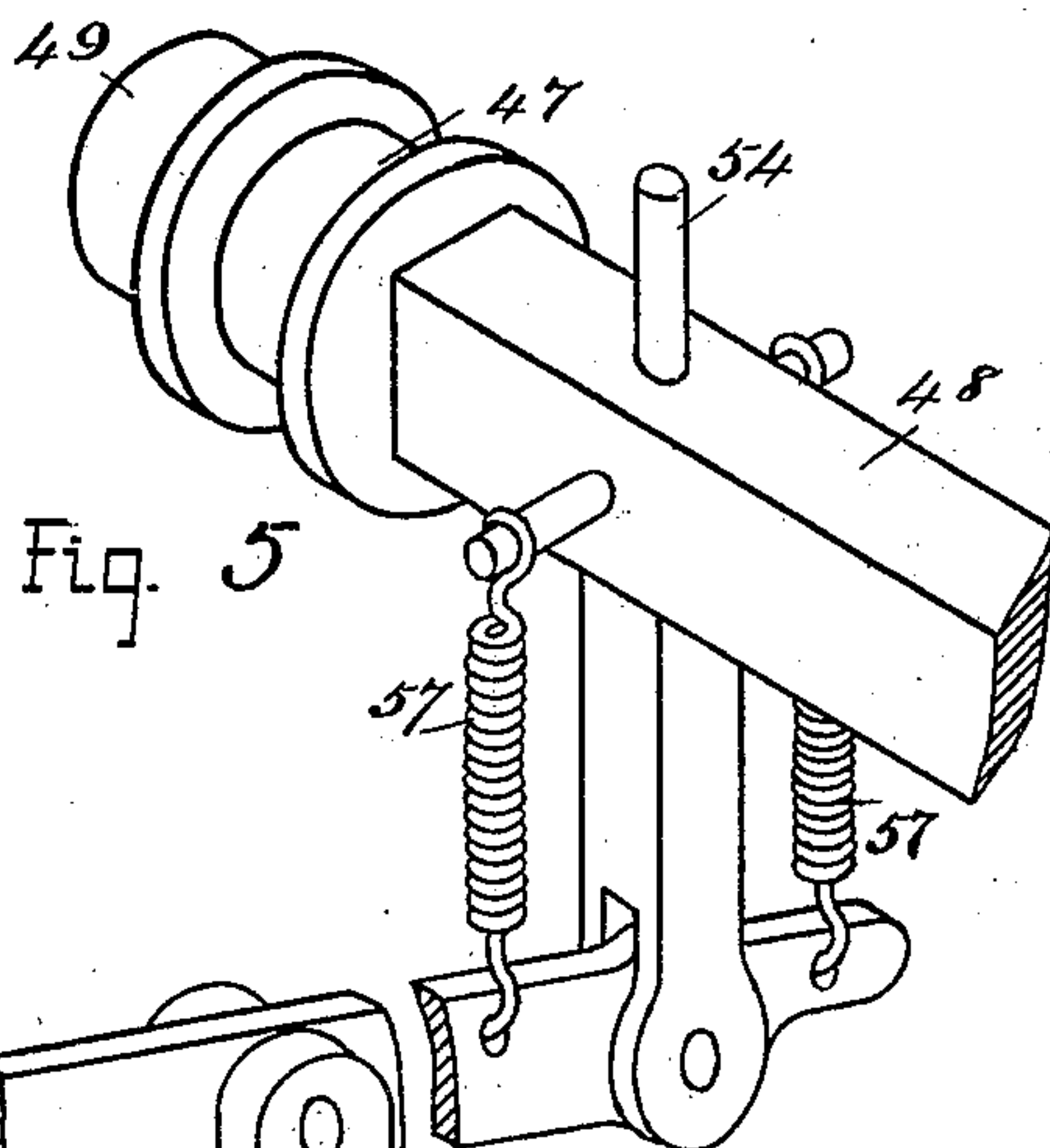


Fig. 5

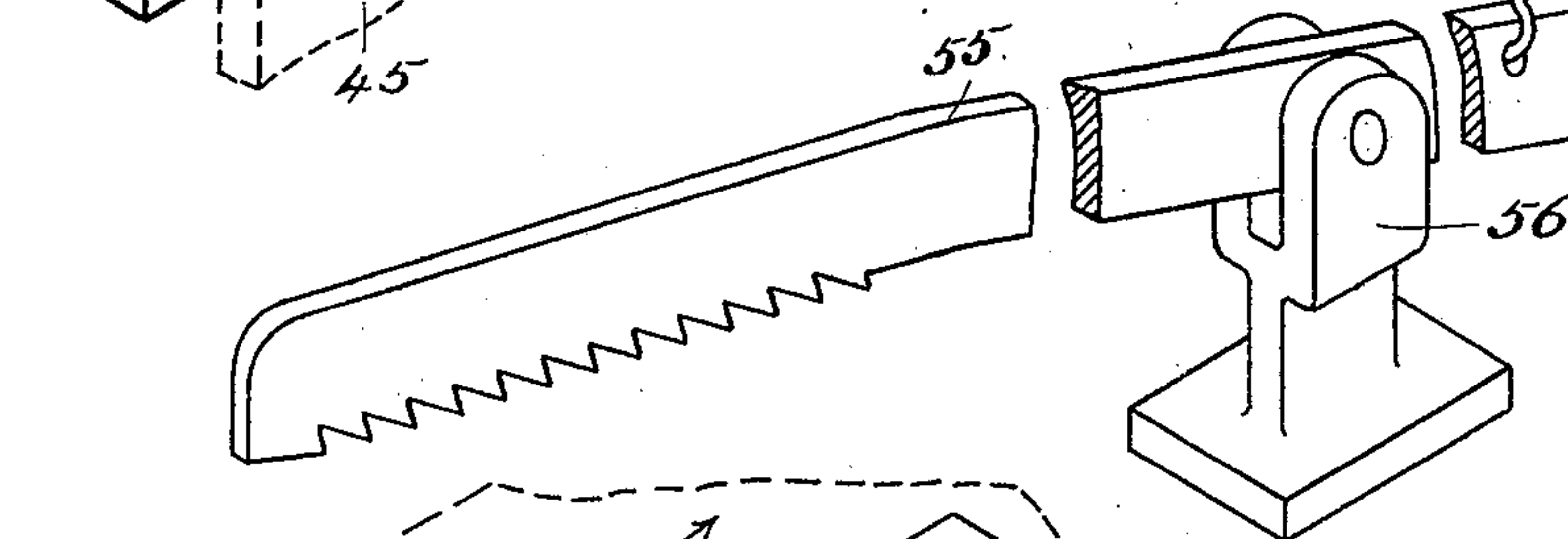


Fig. 7.

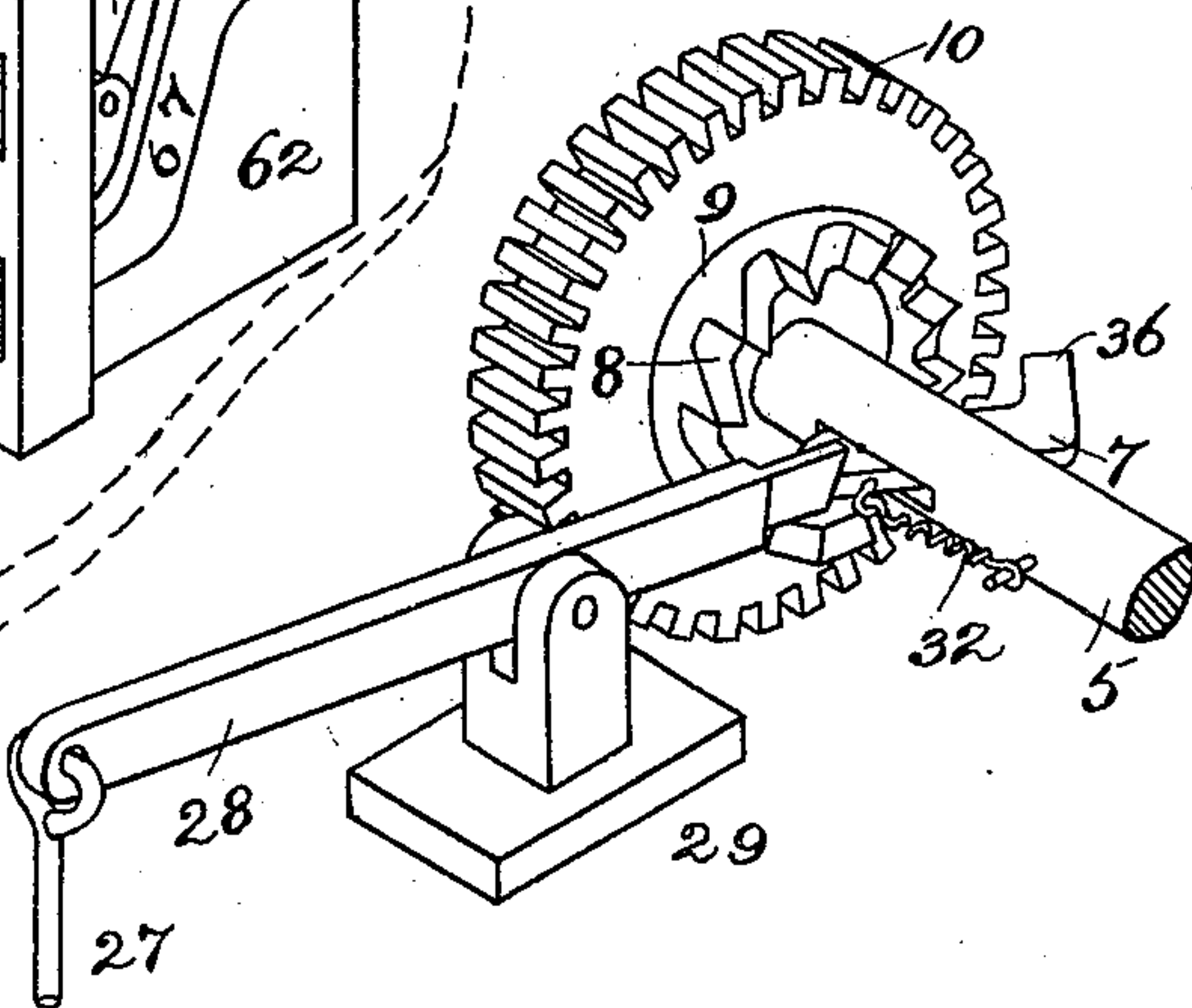


Fig. 8.

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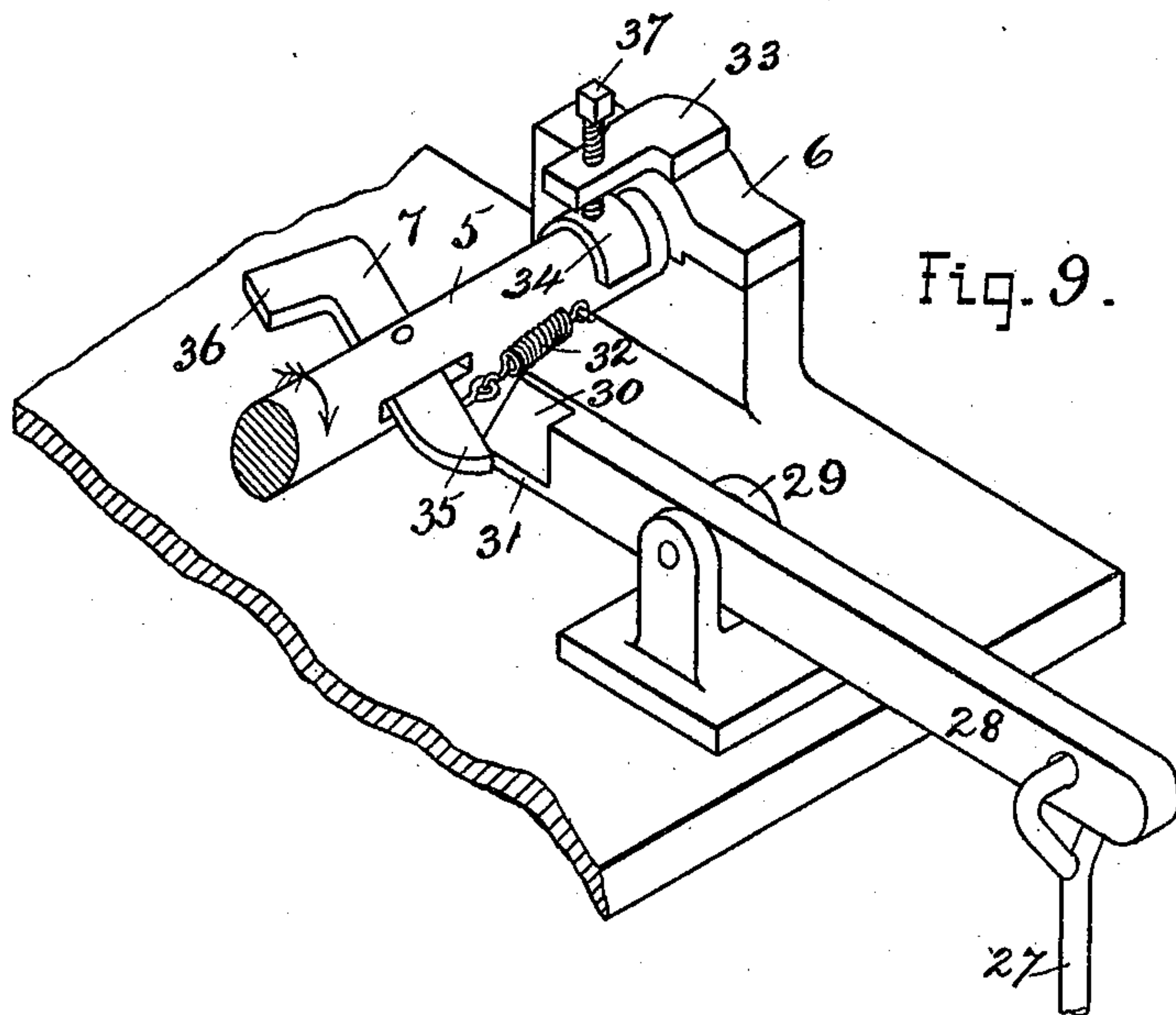


Fig. 9.

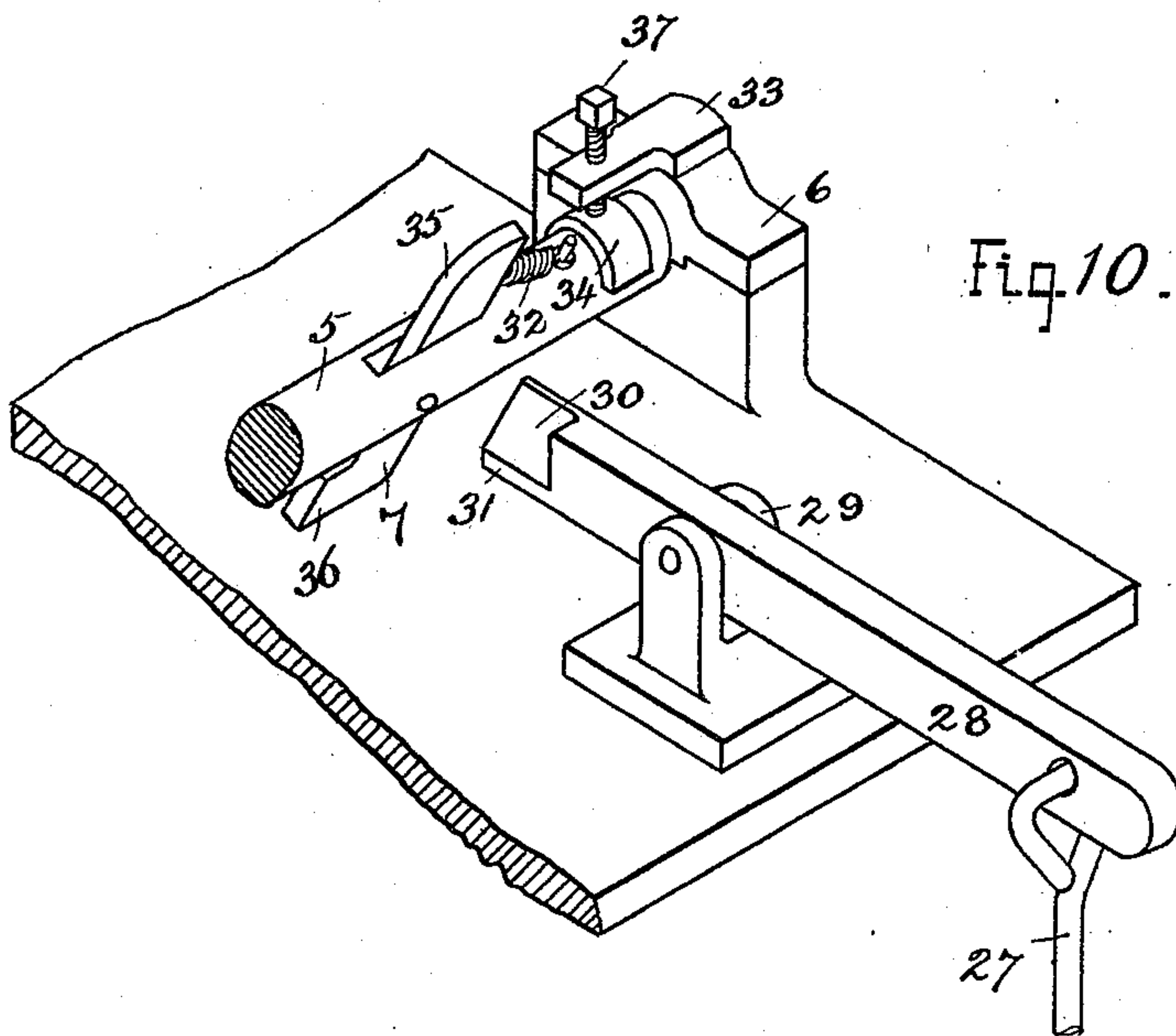


Fig. 10.

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UNITED STATES PATENT OFFICE.

EDWARD SUMMERFIELD CLARKE, OF RICHMOND, VIRGINIA.

SAWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 621,488, dated March 21, 1899.

Application filed May 24, 1898. Serial No. 681,551. (No model.)

To all whom it may concern:

Be it known that I, EDWARD SUMMERFIELD CLARKE, a citizen of the United States of America, and a resident of Richmond city, State of Virginia, have invented certain new and useful Improvements in Sawing-Machines, of which the following is a specification.

My invention relates to sawing-machines wherein are employed a number of circular saws mounted on a shaft and which are intended chiefly to saw into sections dressed or undressed lumber, logs, &c., but which may be applied to other purposes for which sawing-machines are used.

In the drawings which form a part of this specification, and in which like figures refer to like parts, Figure 1 is a plan view of my improved sawing-machine. Fig. 2 is a side elevation of the machine. Fig. 3 is a broken plan of the machine for use as a reference. Fig. 4 is a longitudinal section of the machine on the line xy in Fig. 1. Fig. 5 is a detail in perspective showing the log-holder. Fig. 6 is a detail in perspective showing the cam-path which actuates the log-holder. Fig. 7 is a detail in perspective showing the disappearing stop in the sawing-table and the cam-path which actuates the said disappearing stop. Fig. 8 is a detail in perspective showing the automatic clutch. Figs. 9 and 10 show details in perspective of the automatic clutch.

In Fig. 1, 1 is the sawing-table, which travels on rollers 2 and upon which the logs to be sawed are placed. To this sawing-table is attached a connecting-rod 3, one end of which is attached to the crank 4, which in turn is attached to the shaft 5, which is carried and revolves intermittently in the bearings 6 6. This intermittently-revolving shaft is operated by means of an automatic clutch in the following manner: Attached to the shaft 5 is a pawl 7, which engages in the notches 8 on the disk 9, which is attached to the constantly-running gear-wheel 10, which runs loose on the shaft 5 and which is driven by means of the pinion 11, attached to the shaft 12, which revolves in bearings 13 13. Fixed on the shaft 12 is the sprocket-wheel 14, which is driven by means of a chain 15 from the sprocket-wheel 16, which is mounted on the shaft 17, which is driven by means of the

cone-pulley 18, the belt 19, and the cone-pulley 20, which cone-pulley 20 is mounted on the shaft 21, which shaft is driven from the main shaft 22 by means of the belt 23 and the pulleys 24 and 25.

Now in order to put the sawing-table in motion the operator presses down the lever 26, and in so doing pulls downward the rod 27, which is attached to the end of the lever 28, which is pivoted at 29 and the other end of which is provided with an inclined face 30, as shown in detail in Figs. 9 and 10. This end of the lever 28 is thrown upward when the lever 26 is depressed. Now when the sawing-table 1 is at rest the end 35 of the pawl 7 rests against the face 31 of the lever 28. The spring 32 is then in tension and tends to throw the end 36 of the lever 7 into gear with the notches 8 of the disk 9, which is attached to the constantly-revolving wheel 10. When the operator depresses the lever 26 and so raises the end of the lever 28, which has the bevel-face 30, he frees the pawl 7. The spring 32, acting on the pawl 7, throws its end 36 into gear with the notched disk 9, which, being fixed to the constantly-revolving gear 10, causes the pawl 7 and the shaft 5 to revolve in the direction of the arrow. (See Fig. 9.) Fig. 10 shows the pawl 7 and the shaft 5 nearing the end of a revolution. As the end 35 of the pawl 7 comes down it strikes on the sloping face 30 of the lever 28, (which has returned to its original position after the removal of the pressure on the lever 26,) and continuing to come down the said end 30 of the lever 28 it is forced to one side until it reaches the face 31 of the said lever 28, by which time the end 36 of the pawl 7 has been drawn out of gear with the notched disk 9. In order to prevent the pawl 7 and the shaft 5 from continuing from their momentum to revolve and so pass the point at which they are shown in Fig. 9, a friction-brake is used, consisting of a shoe 34, and a set-screw 37, held in a bracket 33, which is attached to any convenient point, such as the bearing 6. By adjusting the set-screw 37 the shoe 34 can be caused to bear with more or less pressure upon the shaft 5. It will now be seen that by depressing the lever 26 the operator can cause the shaft 5 and the crank 4 to make one complete revolution. If after depressing the lever 26 the operator al-

lows the said lever to immediately rise again to its original position, the shaft 5 and the crank 4 will make but one revolution; but if the operator keeps the lever 26 depressed the shaft 5 and the crank 4 will continue to revolve as long as he does so. For every complete revolution of the shaft 5 and the crank 4 the log-carriage 1 makes one complete movement forward and back again. I have shown the clutch device in the present application because it is a part of my machine; but I have not claimed it, as it will be made the subject of a concurrent application with this one. I desire, however, to reserve all my right therein. Running in bearing attached to the framework 38 is the shaft 39, driven from the main driving-shaft 22 by means of the pulleys 43 and 40 and the belts 44. On this shaft 39 are mounted a number of circular saws 41, the upper parts of which pass through slots 42 in the log-carriage 1.

Attached to the frame of the sawing-machine are rollers 60 60, (see Figs. 2 and 4,) over which the logs may be run onto the log-carriage 1.

61 61 are disappearing stops attached to the log-carriage 1 and which act as stops to bring the logs fairly up to the saws. These stops operate in the following manner: Fixed to the framework of the machine and beneath the log-carriage 1 are the cam-plates 62, Figs. 2 and 7, in which travel rollers 63, which are attached to the stops 61. As the log-carriage (shown in Fig. 7 by dotted lines) travels toward the saws—that is, in the direction indicated by the arrow—the rollers 63 enter the horizontal path 64 of the cam-plates 62, pass the spring-latches 65, and enter the recesses 66. On the return stroke of the log-carriage the rollers 63 are forced to travel down the sloping path 67 of the cam-plates 62 and in doing so lower with them the stops 61, to which they are attached. The rollers then travel along the lower horizontal paths 68 of the cam-plates until they arrive at the open ends, when by means of the springs 69 they and the stops 61 are returned to their original positions, as shown in Fig. 7.

In order to hold the logs securely while they pass through the saws, log-holders 55 55, having teeth, are provided, which operate in the following manner: The log-holders 55 55, pivoted at and supported by the bracket 56, have at one of their ends the pins 54, which pass through the cross-bar 48, which cross-bar has at its ends rollers 49 49, adapted to travel in the cam-path in the cam-plates 51, which are attached to the framework of the sawing-machine. These cam-plates 51 have spring-latches 52 and 53, which allow of the passage of the rollers 49 49 in one direction only in the cam-plates. Fixed to the log-carriage are the upright standards 45 45, having slots 46 in their upper parts, which slots form guides for the journaled ends of the cross-bar 48. (Shown in detail in Fig. 5.) 57 57 are springs used to form a flexible connection be-

tween the log-holders 55 and the cross-bar 48, since the inequalities of the logs to be sawed would render a rigid connection undesirable.

In order to throw the sawed logs from the log-carriage, the intermittently-revolving arms 70 70^a are provided. These arms, which are grouped together in threes, are fixed to the shaft 71, which revolves in bearings 72 72. Keyed at one end of the shaft 71 is a ratchet-wheel 73, (see Figs. 1 and 2,) which is engaged by a pawl 74, which pawl is attached to a disk 75, carrying the gear-wheel 76. The disk 75 and the gear-wheel 76 are mounted loose on the shaft 71. Engaging with the gear 76 are the teeth 77 of the rack-rod 78, which at its farther end carries a roller 79, which engages in the cam-path 80 of the cam-wheel 81. This cam-wheel 81 is mounted on the intermittently-revolving shaft 5 and is so arranged that for every revolution of itself it will cause the shaft 71 to make one-third of a revolution, or just sufficient to enable one of the arms 70 to swing through such an angle as will enable it to throw from the table any log which may be there.

Having now described and explained the uses of the various parts of my improved sawing-machine, I will now describe the operation of the same in the sawing of logs.

Motion is first of all given to the main shaft 22, which by means of the pulleys 43 43 and 40 40 and the belts 44 44 gives continuous motion to the saw-shaft 39 and to the saws 41. The main shaft 22 also gives continuous motion to the shaft 12 through and by means of the pulleys 24 25, the belt 23, the shaft 21, the cone-pulley 20, the belt 19, the cone-pulley 18, the shaft 17, the sprocket-wheel 16, the chain 15, and the sprocket-wheel 14. The operator places a log on the log-carriage 1, as shown in Fig. 4. Then depressing the foot-lever 26 he throws upward the beveled end of the lever 28, so freeing the pawl 7, which by means of the spring 32 is thrown into gear with the continuously-revolving notched disk 9, and so causes the shaft 5, to which the pawl 7 is attached, to revolve also. The log-carriage 1, which is connected to the shaft 5 by means of the crank 4 and the connecting-rod 3, is then caused to travel in the direction indicated by the arrow (see Fig. 4) and carries with it and through the saws 41 the logs which are to be sawed, the latter being held up to the saws by the stops 61 61. Now as soon as the log-carriage begins to travel in the direction indicated by the arrow the rollers 49 on the cross-bar 48 begin to mount the inclined paths 82 of the cam-plates 51, so depressing the notched ends of the log-holders 55 55 until they bear down upon the logs and firmly hold them in position. It will be seen in Fig. 1 that a log-holder is placed upon either side of each saw. This is done so that after the log has passed through the saws and has been sawed into sections each section may be firmly held at its ends by the log-holders. By the

time the shaft 5 has made half a revolution and when the log-carriage is at the end of its travel in one direction the rollers 49 will have passed the spring-latches 52 and will be at the ends 83 of the cam-paths in the cam-plates 51. Upon the return stroke of the log-carriage 1 the rollers 49 will be forced to travel down the inclined parts 84 of the cam-paths in the cam-plates 51, thus gradually relieving the pressure of the notched ends of the log-holders 55 on the logs until when the rollers 49 arrive at the lower parts 50 of the cam-paths in the cam-plates 51 the notched ends of the log-holders 55 are raised clear of the sawed sections of the logs. Now during this return stroke the rollers 63, which are attached to the stops 61, will pass down the inclined part 67 of the cam-paths in the cam-plates 62, thus lowering the said stops 61 below the surface of the log-carriage 1, and so out of the way of the logs. Just at about this time or at about the time that the shaft 5 has made three-quarters of one revolution the cam-wheel 81 is in such a position that its cam-path 80 is beginning to act on the roller 79 to draw the rack-rod 78 in the direction indicated by the arrow. (See Fig. 2.) As the shaft 5 continues to revolve the said rack-rod is drawn quickly in the direction indicated, and so acting on the gear-wheel 76 and through the pawl 74 on the ratchet-wheel 73 gives to the shaft 71, and consequently to the discharging-arms 70 70^a, a partial turn. The amount of turn given to the shaft 71, depending upon the number of arms in a group, is in this case one-third of a complete revolution. If thought advisable, the arms could be grouped in twos or could be mounted singly, in which cases the operating mechanism would be arranged accordingly. Now as the shaft 71 makes this partial revolution, the arms revolving with it, the arms 70^a will swing downward and discharge the sawed sections of logs from the end of the log-carriage, the stops 61 being now below the surface of the log-carriage and consequently out of the way. Immediately after this has taken place the log-carriage 1 will reach its original position. The stops 61 will, their rollers 63 passing out of the lower parts 68 of the cam-paths in the cam-plates 62, be returned by means of the springs 69 to their original positions. The shaft 5 will then complete its revolution. The pawl 7 will strike upon the beveled end of the lever 28 and will be thrown out of gear with the notched disk 9, thus causing the machine to stop.

The slots 85 in the log-carriage 1 (see Fig. 1) are intended to show the proper location of the saws when only three are in use. Any number of these slots can be cut in the log-carriage, so that any number of saws may be used at will and so that they may be spaced at any intervals.

Having now described my invention, what

I claim, and desire to secure by Letters Patent of the United States, is—

1. In a sawing-machine, the combination of the framework, a log-discharger consisting of arms mounted on a shaft, a shaft supported by bearings attached to the framework, a ratchet-gear and a spur-gear attached to the shaft and adapted to be engaged and operated by a rack-rod, a rack-rod, and a cam to operate the rack-rod.

2. In a sawing-machine, the combination of the framework, a log-carriage traveling in the framework to carry logs to a sawing mechanism, mechanism to operate the log-carriage to cause it to move to and from the sawing mechanism, and a log-discharger mounted on an intermittently-revolving shaft supported by the framework and having gearing adapted to be engaged and be intermittently operated by a rod, a rod, and means to operate the rod, the said means being so arranged that it will cause the log-discharger to operate to discharge logs from the log-carriage when the log-carriage is receding from the sawing mechanism.

3. In a sawing-machine the combination of the framework, the saws, the log-carriage traveling in the framework, the clutch-shaft, the clutch-section loose on the shaft the latter having a crank and connecting-rod connected with the log-carriage, a clutch-section turning with the shaft and movable into and out of engagement with the loose clutch-section, an abutment for operating the said movable clutch-section, a cam on the shaft, a rod operated by the said cam, the intermittently-revolving log-discharger intermittently operated through gearing by the said rod, the movable stops attached to the log-carriage, cam-plates attached to the framework to operate the movable stops, the log-holders, a cross-bar by which to operate the log-holders, cam-plates on the framework to operate the said cross-bar, and the springs for regulating the pressure of the log-holders on the logs, substantially as shown and described.

4. In a sawing-machine, the combination of the framework, cam-plates attached to the framework and having cam-slots formed with inclined and horizontal portions, the cross-bar for operating the log-holders and being arranged to engage at its ends in the cam-slots of the cam-plates, standards having vertical slots to guide the cross-bar in a vertical direction, log-holders, springs for forming an elastic connection between the log-holders and the cross-bar, the saws, and the log-carriage traveling in the framework, substantially as described.

Signed by me, at Richmond city, this 30th day of April, 1898.

EDWARD SUMMERFIELD CLARKE.

Witnesses:

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