

No. 612,766.

Patented Oct. 18, 1898.

R. T. BURCHELL.

HOSE MACHINE.

(Application filed Jan. 25, 1898.)

(No Model.)

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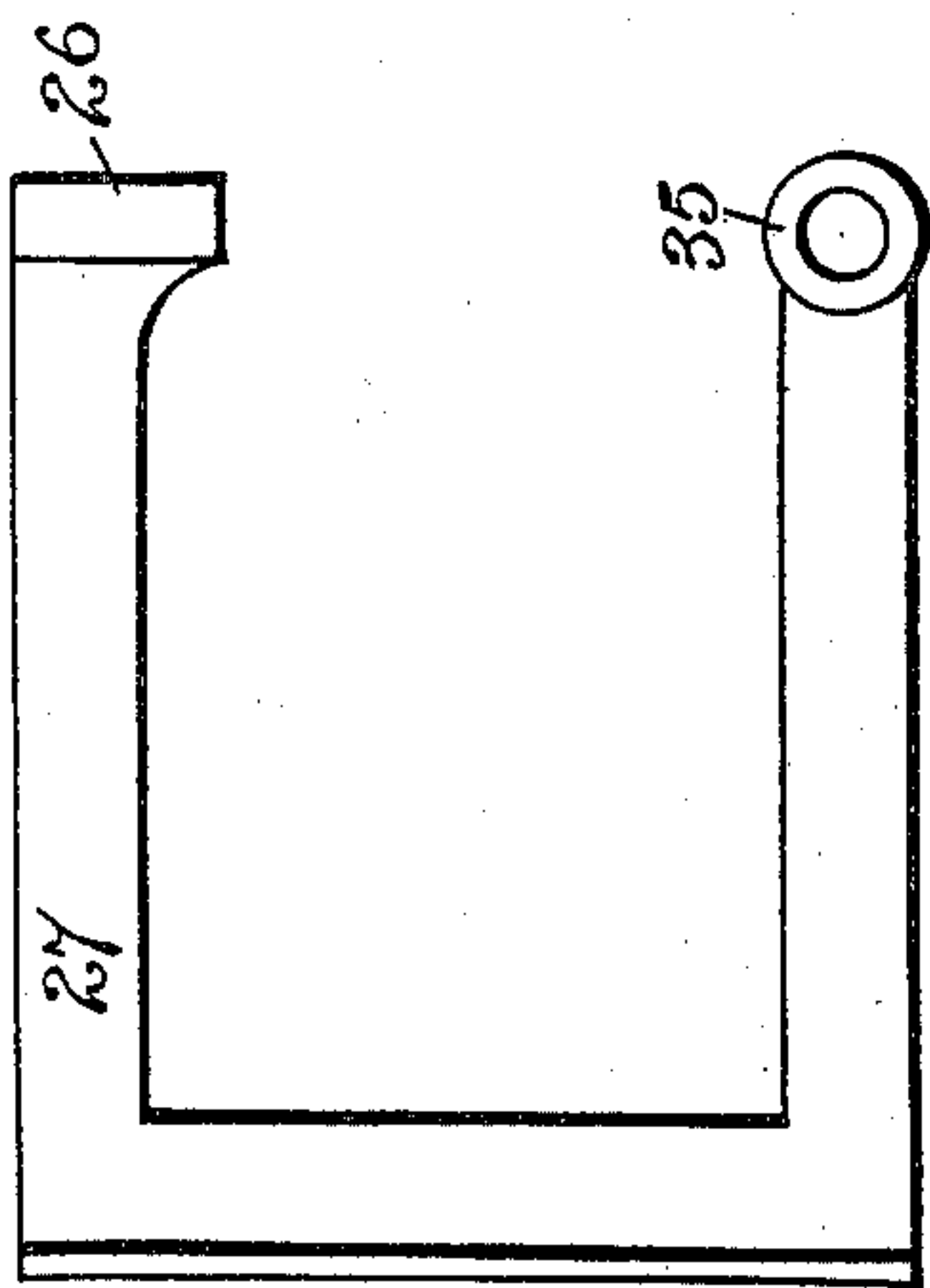
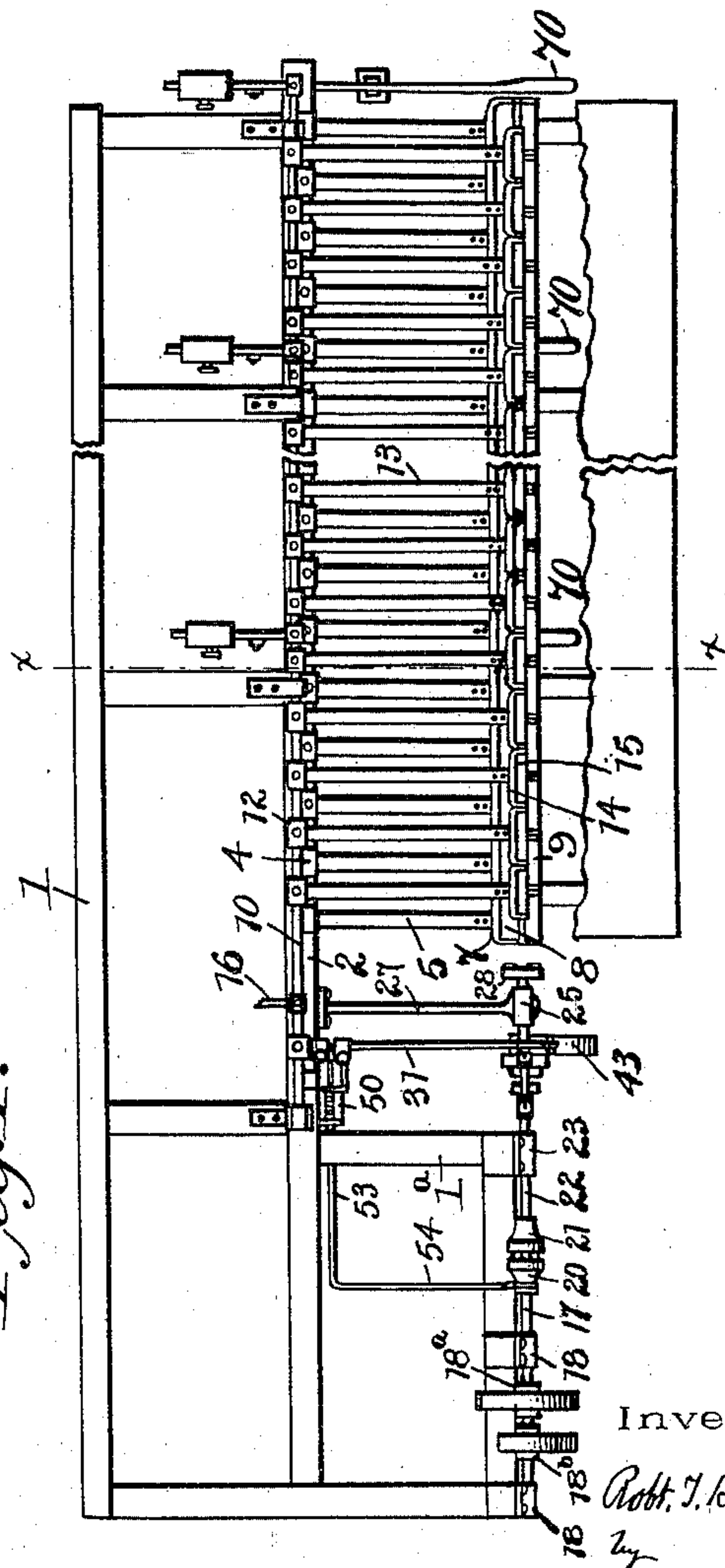


Fig. 8.

Fig. 1.



Witnesses.

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Fig. 6.

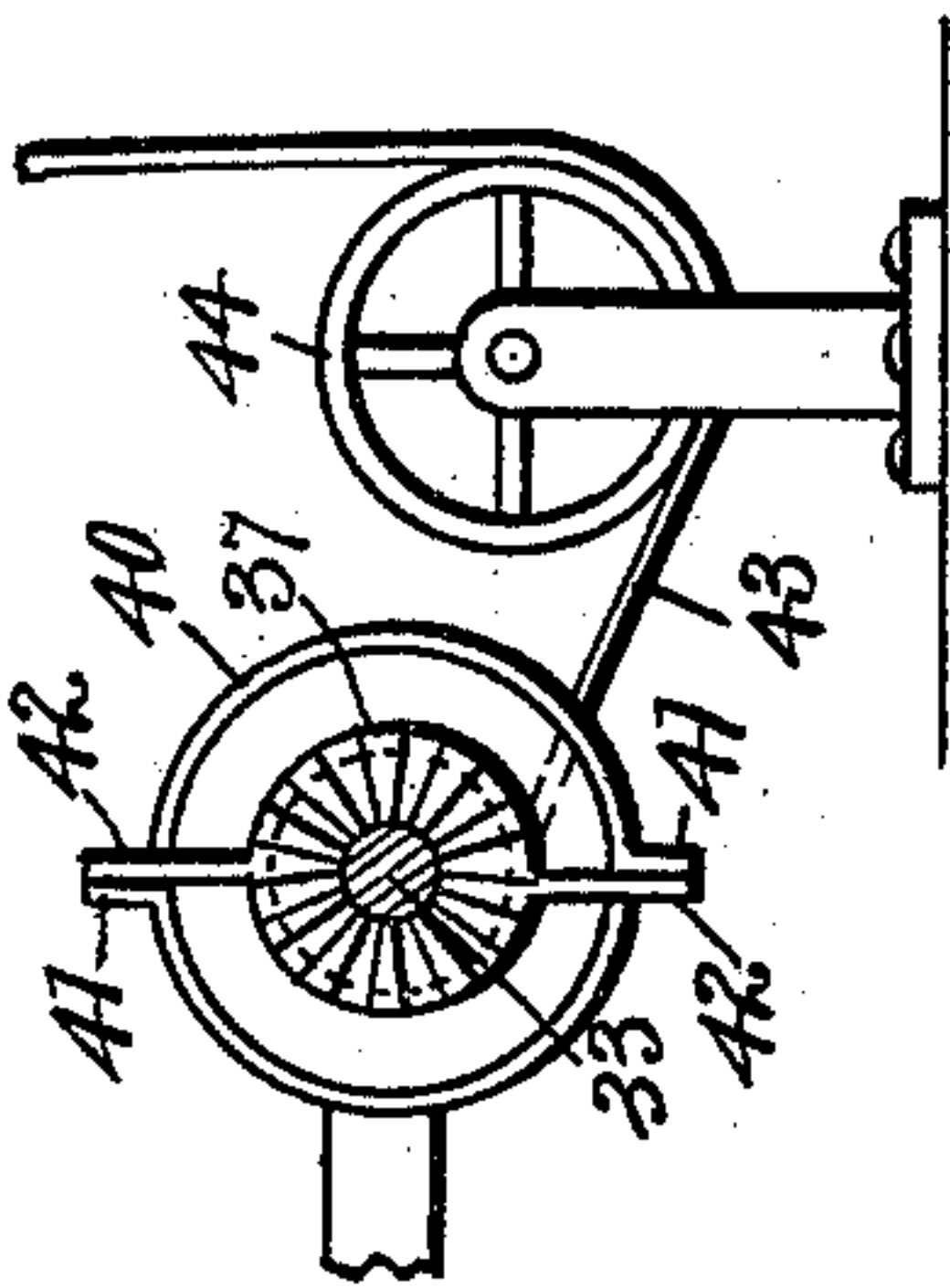


Fig. 5.

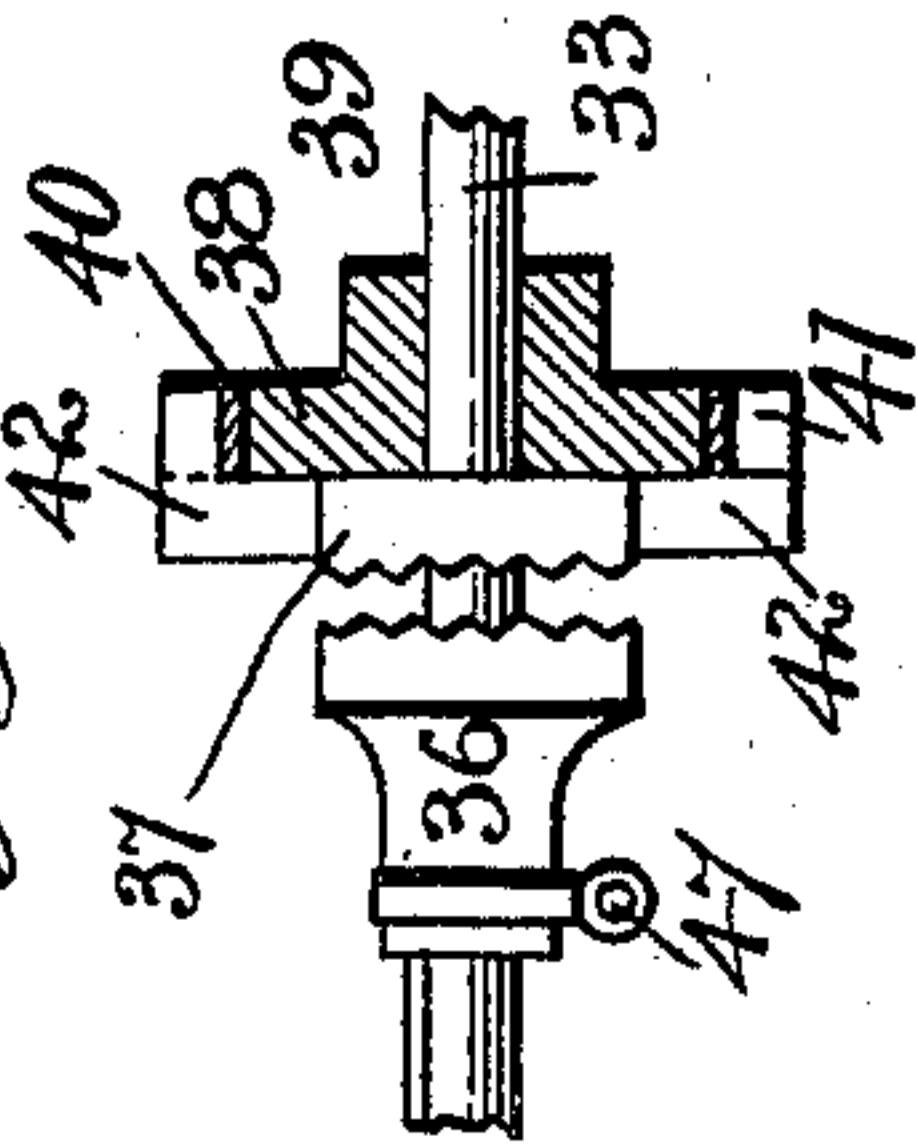
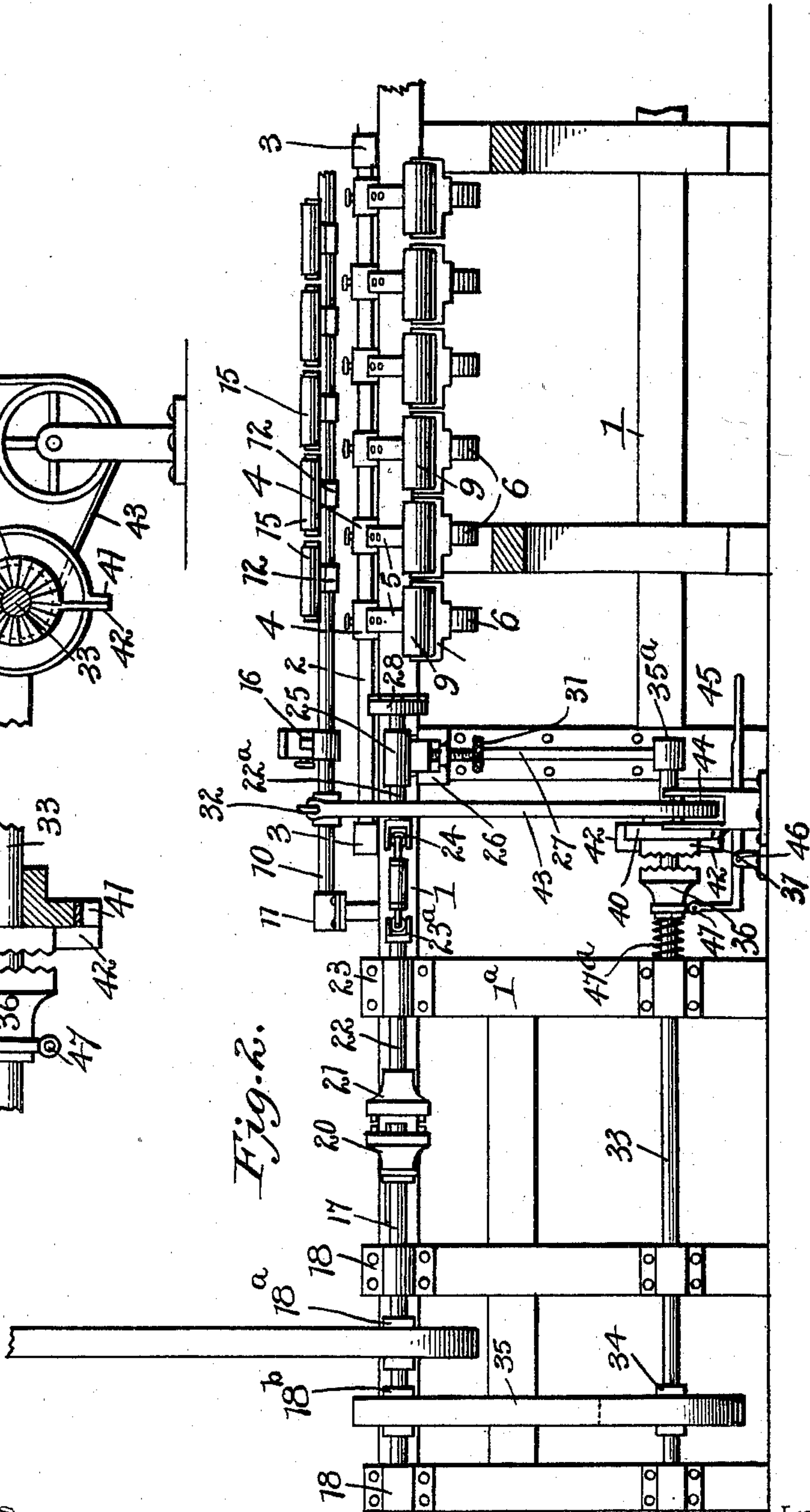


Fig. 2.



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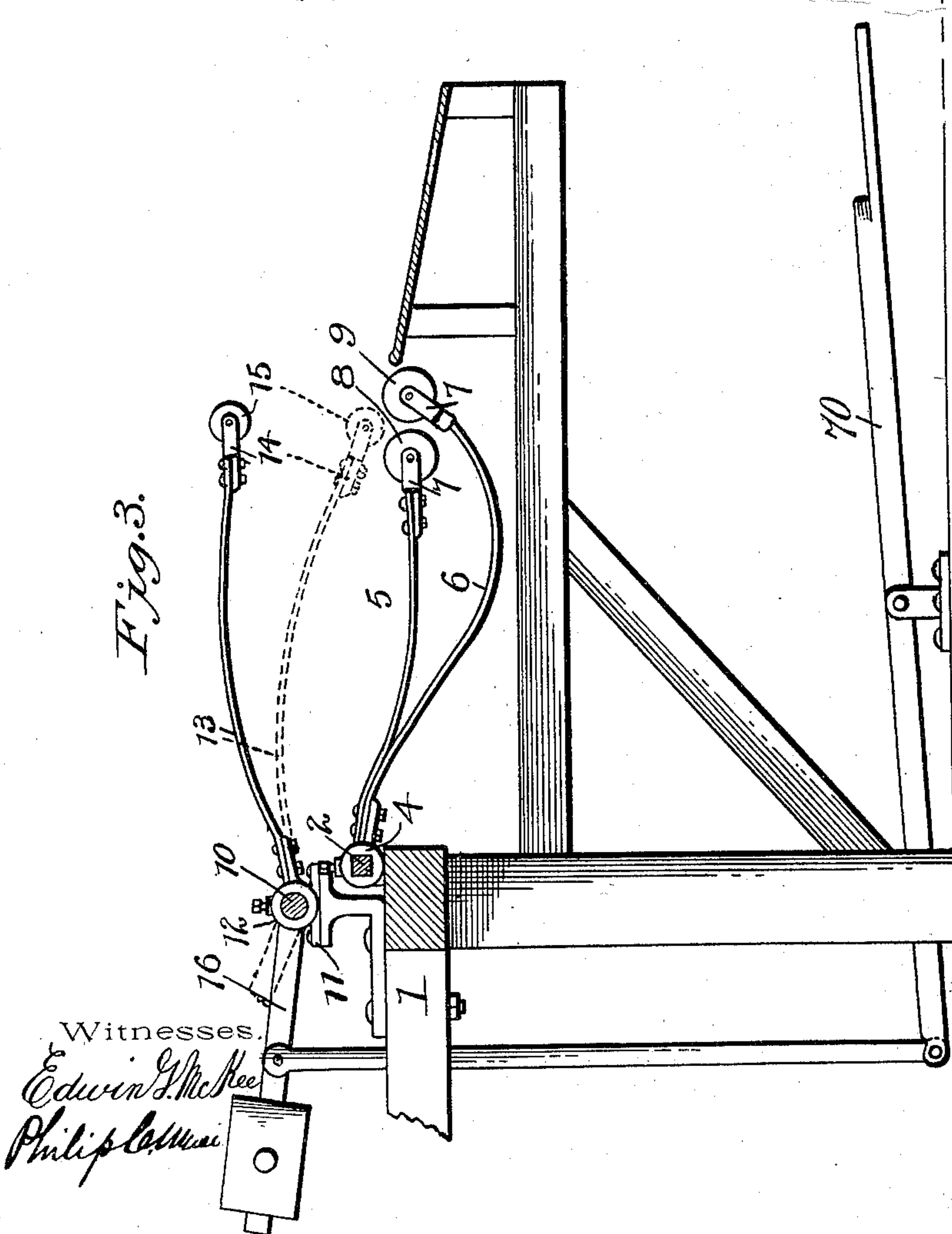
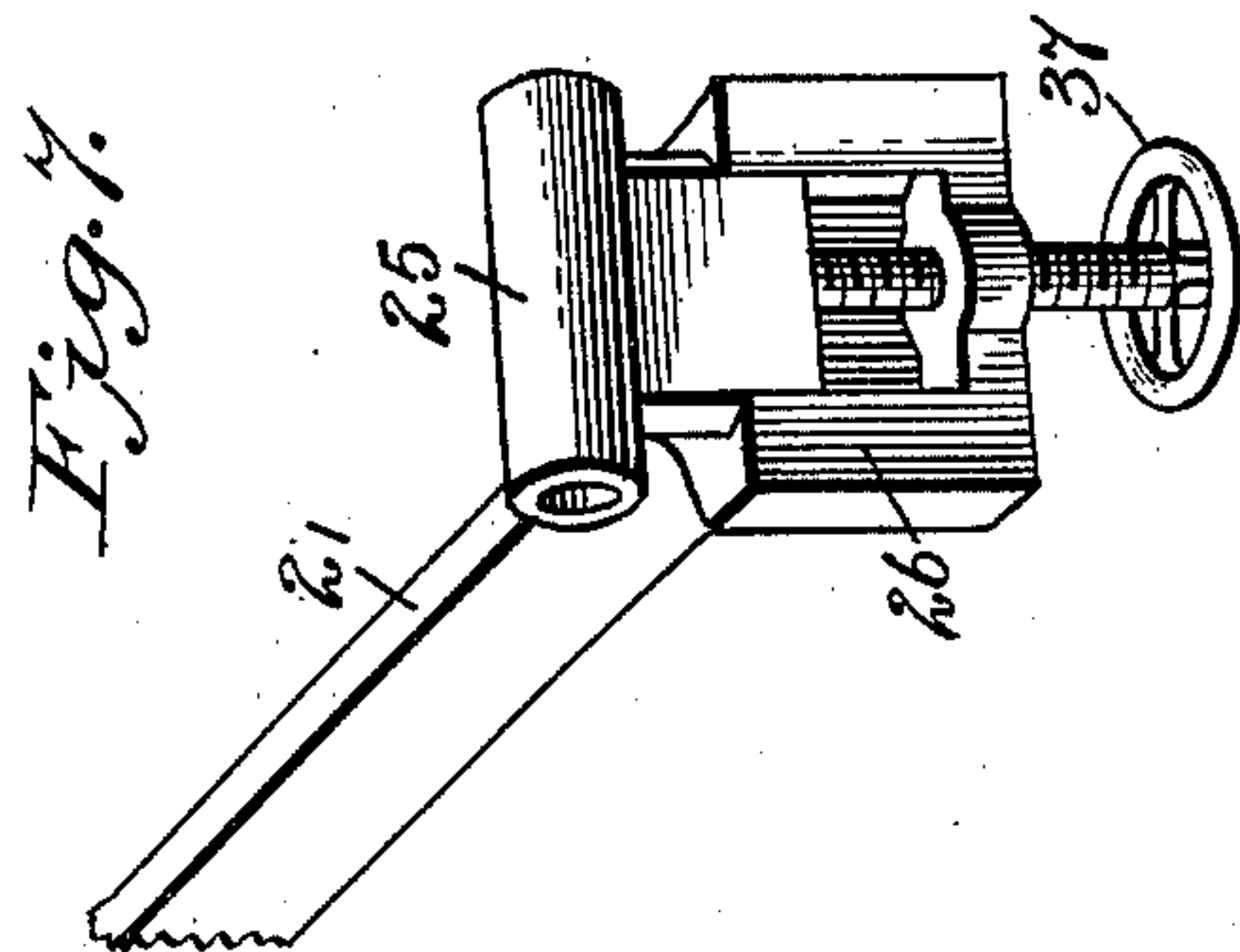
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4 Sheets—Sheet 3.



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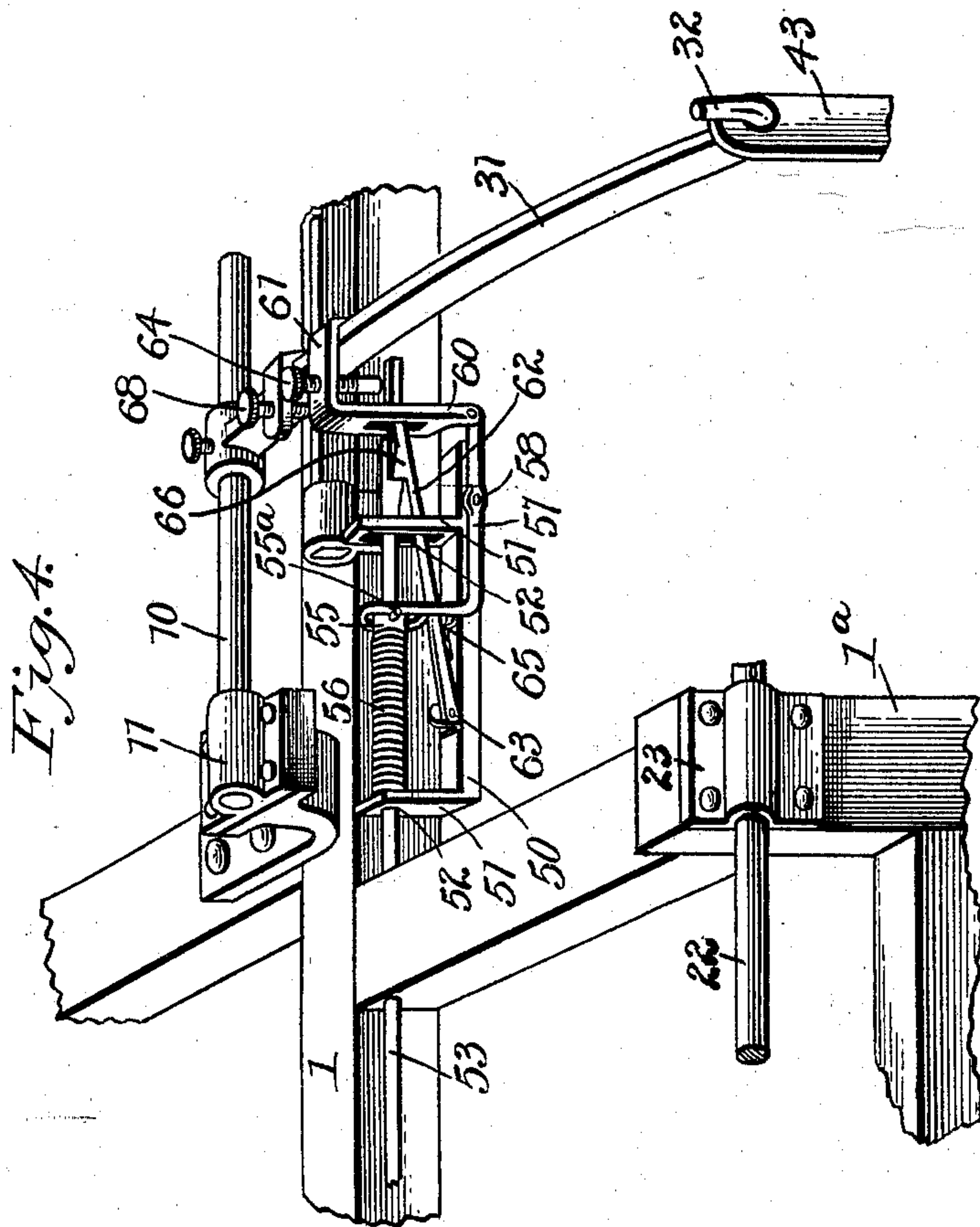
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4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

ROBERT THOMPSON BURCHELL, OF TRENTON, NEW JERSEY, ASSIGNOR TO
SAMUEL K. WILSON, OF SAME PLACE.

HOSE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 612,766, dated October 18, 1898.

Application filed January 25, 1898. Serial No. 667,901. (No model.)

To all whom it may concern:

Be it known that I, ROBERT THOMPSON BURCHELL, a citizen of the United States, and a resident of Trenton, in the county of Mercer and State of New Jersey, have invented certain new and useful Improvements in Hose-Machines; and I do 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, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a plan view, partly broken away, of a machine embodying my invention. Fig. 2 is a side elevation of the same with a portion broken off. Fig. 3 is a transverse vertical section on the line *xx*, Fig. 1. Fig. 4 is a perspective view showing the clutch-operating mechanism. Figs. 5 and 6 are detail views of the friction devices in connection with the clutch. Fig. 7 is a detail perspective view showing the vertically-adjustable box for the jointed mandrel-driving shaft. Fig. 8 is a detail view of a part of the frame.

This invention has relation to hose-machines, and is designed to provide a simple, practical, and efficient machine for the manufacture of long hose, although equally well adapted for the purpose of making short hose or hose-sections.

The invention relates more particularly to means for supporting the hose pole or mandrel and to means for driving the same, to means for insuring a perfectly solid and uniform winding of the duck or other material used in the manufacture; to means for regulating and controlling the pressure of the wrapping or winding devices, and also to automatic mechanism for throwing the mandrel-driving mechanism into and out of operation at the proper time.

The invention also consists in the novel construction and combination of parts, all as hereinafter described, and pointed out in the appended claims.

Referring to the accompanying drawings, the numeral 1 designates the frame of the machine, which is of a length somewhat greater

than the length of the longest piece of hose which can be made upon the machine, which in the machines heretofore built by me is fifty feet.

2 is a stationary shaft which is held and supported in hangers 3 and which extends nearly the full length of the machine. This shaft may be squared throughout its length, as shown, or it may be squared only where it enters the end hangers 3. Secured to the said shaft throughout its length by means of sleeves 4 are two series of forwardly-extending spring-arms 5 and 6. Each of these arms has a fork 7 at its forward end, and journaled in each fork is a roller 8 or 9, of steel or other suitable material. These two series or lines of rollers lie adjacent to each other in the same horizontal plane and are parallel.

10 designates a rock-shaft which is supported above the shaft 2 and parallel therewith in boxes 11, which are secured to the frame 1. Secured to said rock-shaft at intervals throughout its length are sleeves 12, and to each of these sleeves is secured an upwardly-curved forwardly-extending spring-arm 13, having a fork 14 at its forward end, in which is journaled a short roller 15. The line or series of rollers 15 when in operative position lie above and centrally of the rollers 8 and 9, as best shown in Fig. 3. Connected to said rock-shaft are rearwardly-extended counter-weighted arms 16.

17 designates a short driving-shaft which is journaled in boxes 18 at one end portion of the machine upon a forward extension 1^a of the frame. 18^a and 18^b are belt-pulleys on said shaft.

20 is an endwise-movable clutch-coupling section which is mounted on the inner end of the shaft 17 to rotate therewith and which is designed to engage with an opposing section 21 on the end of a shaft 22. The shaft 22 is journaled in a long box 23 and is provided with two universal joints 23^a and 24. The end section 22^a of the shaft 22 is journaled in a box 25, which is vertically adjustable in guides 26 of a frame-piece 27 and which is adjusted by means of a screw 31. On the end of said end section 22^a is a chuck 28, in which is designed to be secured one end portion of a hose pole or mandrel 29. This hose

pole or mandrel is secured at this end only and is supported and carried by the two lower series of rollers 8 and 9, upon which it rests. By means of the universal joints 23 and 24 5 and the vertically-adjustable box 25 said chuck and the mandrel can be adjusted to suit the particular diameter of hose being made.

Secured to the rock-shaft 10 at the driving- 10 end portion of the machine is a rigid forwardly-extending arm 31, which terminates in a hook 32. Journaled on the frame extension 1^a, below the shaft 17, is a short shaft 33, having a belt-pulley 34, which is driven 15 by a belt 35 from the pulley 18^b on the shaft 17. At its opposite end from the pulley 34 this shaft 33 is extended beyond the frame extension 1^a and has a bearing at 35 in the frame-piece 30 above referred to. On this 20 extended portion of the shaft 33 is an end-wise-movable clutch-section 36, which turns with the said shaft, and adjacent thereto is a loose clutch-section 37. Adjacent to the section 37 is a loose pulley 38, having a boss 25 39. Placed around the pulley 38 is a friction-band 40, having opposite lugs or projections 41, and on the clutch-section 37 are lugs 42, which are designed to engage these lugs or projections of the friction-band. (See Fig. 6.) 30 Connected at one end to the boss 39 of the pulley 38 is a band or strap 43, which passes underneath a pulley 44, journaled in a bracket secured to the floor adjacent to the machine. From this pulley the said strap or band ex- 35 tends upwardly to the hook 32 of the arm 31, which it engages by means of a loop or ring. Arranged as thus described the clutch-section 37 is driven by the engagement therewith of the clutch-section 36, and the pulley 40 38 is driven by the engagement of the lugs of its friction-band with the lugs of the section 37, thereby winding the band or strap 43 on the boss 39 and pulling down on the arm 31. This actuates the rock-shaft 10 to bring the 45 rollers 15 into operative position with respect to the mandrel and also to put said rollers or their carrying-arms under tension. When, however, further movement of the arm 31 is stopped by a device hereinafter described, 50 the band 40 will slip on the pulley 38, and the latter will remain idle until the tension is relieved. The clutch-section 36 is thrown into engagement by means of a treadle or foot lever 45, fulcrumed at 46, and which has 55 a forked arm 47, which engages the grooved hub of said clutch-section. A spiral spring 47^a is arranged to move said clutch-section 36 in the opposite direction when the foot is removed from the treadle.

60 In the operation of the machine it is extremely important that the mandrel or hose-pole shall not commence to rotate until the rollers 15 have been brought into operative relation thereto and properly tensioned. I 65 have accordingly devised means whereby the mandrel remains stationary until these rollers have been brought to position and ten-

sioned and for then automatically throwing the driving devices for said mandrel into operation. These devices will now be described. 70

Supported on the frame 1 at the driving end of the machine is a frame 50, having upright arms 51, provided each with an elongated vertical slot 52. Resting in these slots is a rod 53, having at one end a forked arm 54, 75 at right angles thereto, which engages the grooved hub of the clutch-coupling section 21 on the shaft 17. Coiled around the said rod and bearing against one of the arms 51 at one end and against a collar 55 on said rod 80 at its opposite end is a heavy coiled spring 56. The collar 55 has a projecting pin 55^a.

57 is a lever which is fulcrumed to the frame 50 at the point 58 and which has at one end a vertical arm which engages the pin 55^a of the 85 collar 55. At its opposite end said lever has jointed thereto a vertical arm 60. The arm 60 in the arrangement shown is bent laterally, as shown at 61, and is connected to the arm 31 of the rock-shaft 10. 90

62 is a rod which is pivoted at one end at 63 to the frame 50 and which extends obliquely upwardly toward the opposite end of said frame, passing through the slot in one of the upright arms 51 and also through a 95 slot in the arm 60, its bent end portion extending underneath the laterally-bent portion of the arm 60. 64 is an adjusting-screw which is seated in the said laterally-bent portion and is adapted to contact with the un- 100 derlying end portion of the said rod 62. 65 is a spring which supports the said rod 62.

66 is a catch projection on the rod 62, which is designed to engage a similar but reversed projection 67 on the adjacent portion of the 105 rod 53.

68 is an adjusting-screw which is seated in the arm 31 and which is adapted to contact with the shaft 2 to limit the downward movement of the arm 31. 110

The pivot 58 and the pivot which connects the arm 60 to the lever 57 can be made sufficiently loose to permit the necessary movement between said arm 60 and lever 57 when in operation. 115

The operation of the machine is as follows: The hose pole or mandrel, with the inner tube or lining of the hose slipped thereon, is secured in the chuck 28 at one end and rested on the two lines or series of short rollers 8 120 and 9. The foot is then pressed on the treadle 45, which throws the clutch-section 36 into engagement with the section 37, thereby setting in motion the pulley 38 and winding the strap 43 on its boss 39. This draws down the 125 arm 31, rocking the shaft 10 forwardly, and thereby brings the rollers 15 into contact with the mandrel or with the tube or lining thereon. The set-screw 64 as the said arm 31 approaches the limit of its downward movement comes 130 into contact with the underlying end portion of the rod 62. This contact depresses the said rod 62, and thereby releases the catch engagement 66 and 67 between said rod and the

clutch-shifting rod 53, which engagement had theretofore been holding the said rod 53 against endwise movement under the action of its spring. As soon as rod 53 is released from such engagement it moves endwise and brings the clutch-coupling 20 into engagement with the coupling-section 21 and thereby sets the mandrel in motion. The strip of duck or other wrapping material has previously been stuck at one edge to the inner tube or lining on the mandrel and is now wound thereon by the rotation of the mandrel, the winding being made uniform and smooth by the action of the short rollers. In order to prevent joints or breaks and to provide a continuous bearing of these rollers, the latter are made to break joints with each other, as shown in Fig. 1. The pressure of the rollers is regulated by the screw 68. When the lever 31 comes to the proper position to give the desired degree of pressure, this screw comes in contact with the shaft 2. The pulley 38 then ceases to turn and the pressure is held at this degree. As soon as the hose is wound the foot is removed from the treadle 45 and the spring 47 moves the clutch-section 36 out of engagement with the section 37. The counterweighted arms of the rock-shaft now rock said shaft backwardly, raising the entire line of rollers 15 away from the mandrel. As the arm 31 rises it pulls on the lever 57 and causes the vertical arm thereof to engage with the pin 55^a of the collar 55, thereby moving the rod 53 to throw the clutch-coupling section 20 out of engagement and thereby stop the rotation of the mandrel. This action also puts the spring 56 under tension and brings the catches 66 and 67 again into engagement ready for the next operation.

Owing to the length of the rock-shaft 10 and in order to secure a more uniform pressure of all the rollers throughout the series, treadle-levers 70 are provided at intervals. These levers are arranged, as shown, to act upon the said rock-shaft at its intermediate and distant portions.

The duck employed in the wrapping is usually formed of bias strips having their selvage-edge portions overlapped, thus making the material of double thickness at these portions. Heretofore it has been very difficult, if not impossible, to secure a perfectly smooth and uniform wrapping owing to the fact that these double-thick portions take the pressure of the rollers to the exclusion of the intermediate portions. By means of the series of short independently-yieldable rollers I am enabled to overcome this difficulty. I am also able to make good hose on a bent or crooked mandrel or hose-pole.

It will be obvious that short lengths of hose may be made on the machine as well as long hose.

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

1. In a long-hose machine, the combination with a mandrel-driving shaft provided with means whereby one end of a hose mandrel or pole may be secured thereto, of two parallel series of short rollers which support and carry said mandrel or pole, a rock-shaft, a series of spring-arms carried by the said rock-shaft, a third series of short rollers journaled to the said arms and lying above and centrally of the supporting and carrying rollers, and means for regulating the tension or pressure of the said rollers, substantially as specified.

2. In a hose-machine, the combination with a mandrel-driving shaft provided with means whereby one end of a hose mandrel or pole may be secured thereto, of two parallel series of short rollers which support and carry said mandrel or pole, a rock-shaft, a series of spring-arms carried by the said rock-shaft, a third series of rollers carried by the said arms and lying above and centrally of the supporting and carrying rollers, means whereby said rollers may be put under tension and properly positioned with respect to the mandrel before the latter commences to turn, and means for subsequently automatically bringing the driving devices for said mandrel into operation, substantially as specified.

3. In a long-hose machine, the combination of a driving-shaft for one end of the hose pole or mandrel, the mandrel carrying and supporting rollers, the series of short pressure-rollers, the series of spring-arms which carry the same, the rock-shaft which carries the said arms and which has also a rigid arm, a strap or the like connected at one end to the said rigid arm, a rotary shaft having a loose disk thereon to which the other end of the said strap is connected, a friction device whereby said disk under certain conditions turns with the said shaft, and a clutch device for controlling the operation of the friction device, substantially as specified.

4. In a hose-machine, the combination with a series of pressure-rollers, and with a rock-shaft which carries the same, of a rotary shaft, a slidable clutch-section thereon, an opposing loose clutch-section having lugs thereon, an adjacent loose pulley having a boss, a friction-strap on the said pulley and provided with lugs adapted to be engaged by the lugs of the adjacent clutch-section, of a band or strap connected at one end to the said boss and at its opposite end to an arm of the said rock-shaft, and means for actuating said sliding clutch-section, substantially as specified.

5. In a hose-machine, the combination with a mandrel-driving shaft formed in two sections, and a clutch-coupling which connects the said sections, of a rock-shaft, a series of pressure-rollers carried thereby, means for actuating the said shaft to put said rollers under tension, and an automatic clutch-operating device connected with said clutch-coupling and operated by the movement of

the said rock-shaft to throw the said coupling into and out of operative engagement, substantially as specified.

6. In a hose-machine, the combination with
5 the mandrel-driving shaft formed in two sections, the clutch-coupling which connects the two sections, the series of pressure-rollers, the rock-shaft which carries the said rollers, and means for actuating said shaft in both
10 directions, of the clutch-shifting rod, the spring for moving said rod in one direction, the lever operated by the backward movement of the rock-shaft to move said rod in the opposite direction, the trip-rod which normally holds the shifting-rod against the action of its said spring, and an adjustable device carried by the said rock-shaft for releasing said trip-rod, substantially as specified.

7. In a hose-machine, the combination with
20 the series of pressure-rollers, and the rock-shaft which carries the said rollers and which has also a rigid arm, and with a clutch-coupling device which controls the operation of the mandrel-driving shaft, of the automatic
25 clutch-shifting device, consisting of a shifting-rod, a spring which moves the said rod in one direction, a trip device which holds the said rod against the action of the said spring, an adjustable device carried by the
30 arm of said rock-shaft and arranged to contact with the said trip device to release its engagement with the shifting-rod, and a lever connected to the said arm of the rock-shaft and arranged to move said shifting-rod in the
35 opposite direction, substantially as specified.

8. In a long-hose machine, a mandrel which is connected to the machine at one end only, the two series of short yielding rollers which support and carry the said mandrel, a rock-
40 shaft, a series of spring-arms carried by the

said shaft, a short roller journaled to the free end portion of each of the said arms and adapted to bear on the mandrel, a mandrel-driving shaft, means for actuating the rock-shaft to apply pressure to the said rollers, 45 means for regulating the degree of pressure, and an automatically-operating clutch device for throwing the mandrel-driving shaft into and out of driving connection with the mandrel at the proper times, substantially as 50 specified.

9. In a long-hose machine, a mandrel-driving shaft, a clutch device for controlling the operation of the same, the yieldingly-supported carrying-rollers for the mandrel, the 55 series of short pressure-rollers, means for putting said pressure-rollers under tension, and means whereby the mandrel-driving shaft remains inoperative until said rollers are properly tensioned and positioned with 60 respect to the mandrel, substantially as specified.

10. In a hose-machine, a mandrel-driving shaft having means for holding one end of the mandrel, two parallel series of short hold- 65 ing and carrying rollers for the mandrel, a series of short rollers lying above and centrally of the holding and carrying rollers, spring-arms which carry the upper series of rollers, and means for putting said arms un- 70 der tension, said several series of rollers being arranged to break joints with each other, substantially as specified.

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

ROBERT THOMPSON BURCHELL.

Witnesses:

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JOHN G. HOWELL.