W. M. WILKIN.

MECHANISM FOR OPERATING SAWMILL SET WORKS.

APPLICATION FILED DEC. 6, 1915.

1,230,969.

Patented June 26, 1917.

3 SHEETS—SHEET 1.

Fig. 1.

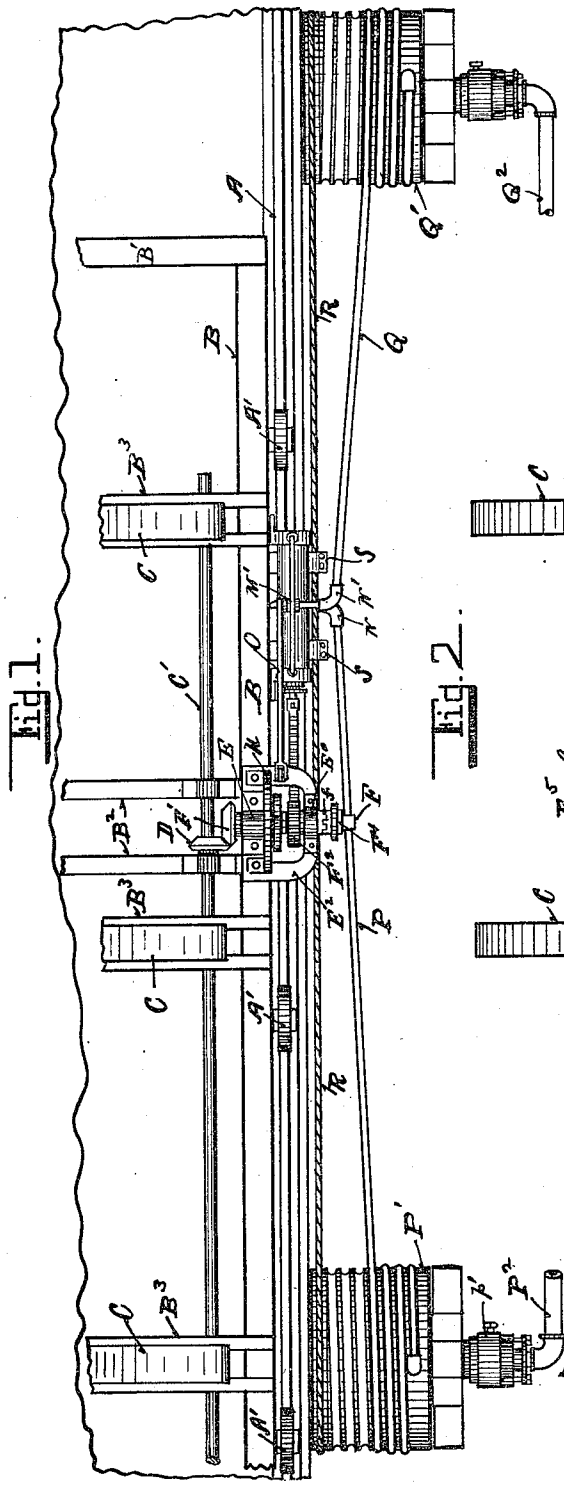
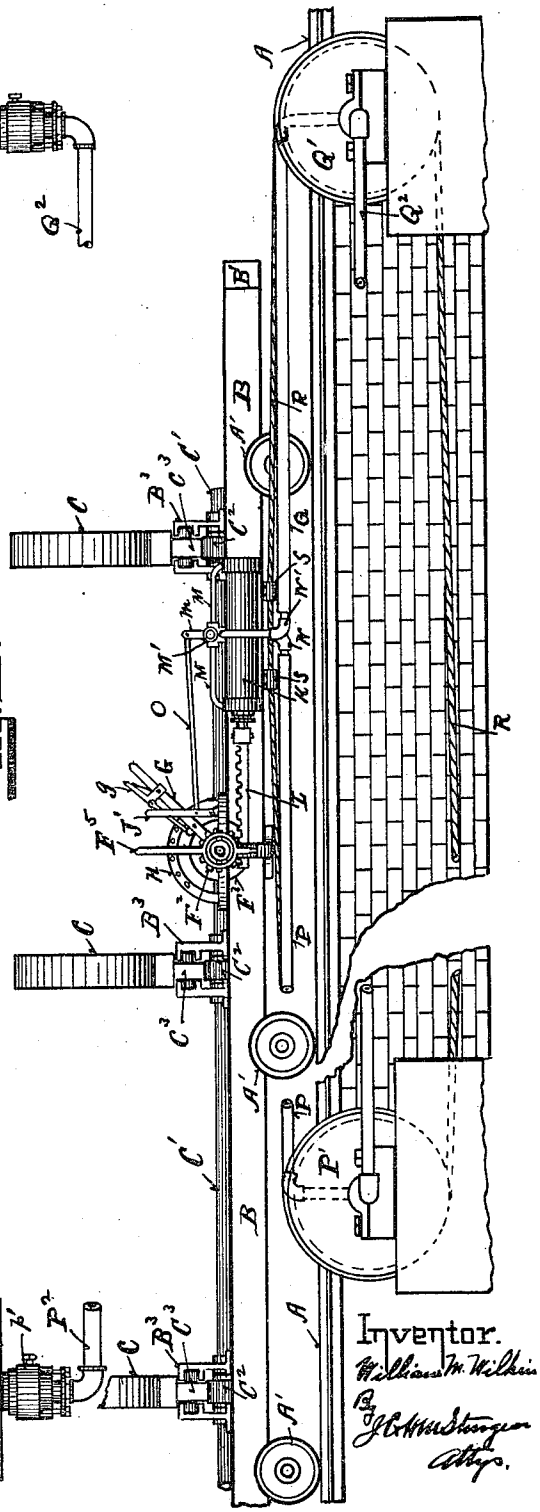


Fig. 2.



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3 SHEETS—SHEET 2.

Fig. 3.

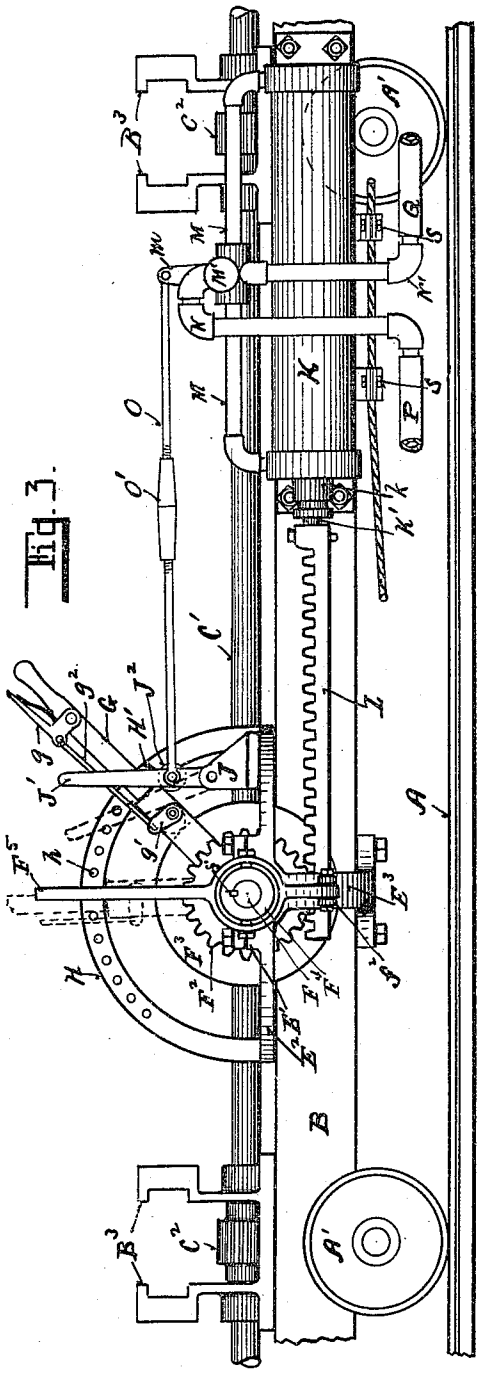
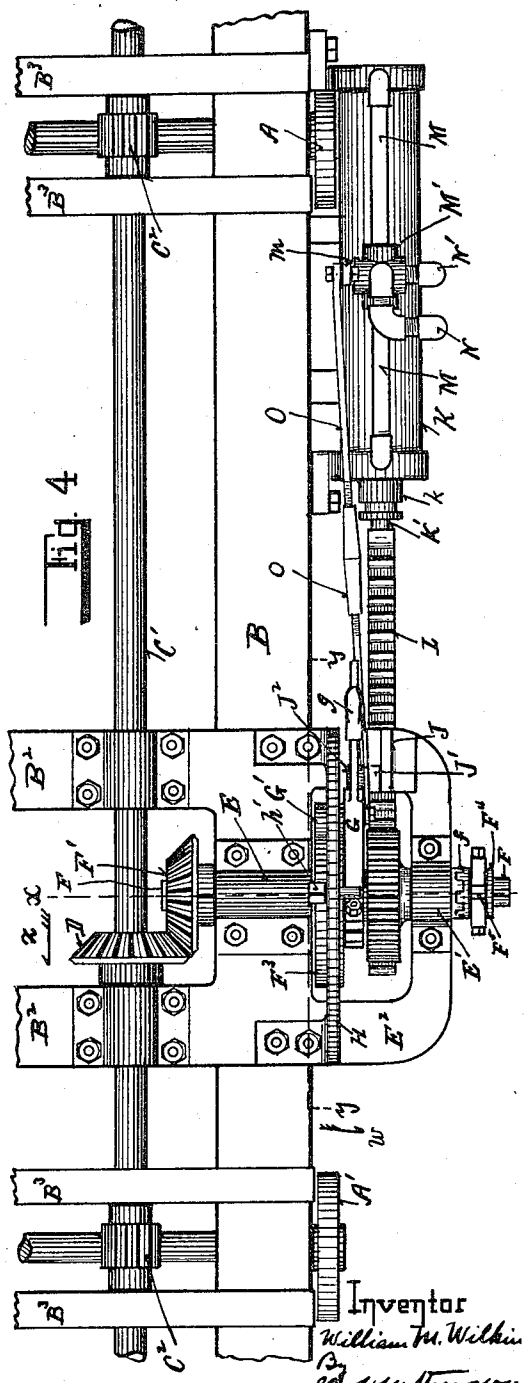


Fig. 4.



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3 SHEETS—SHEET 3.

Fig. 6.

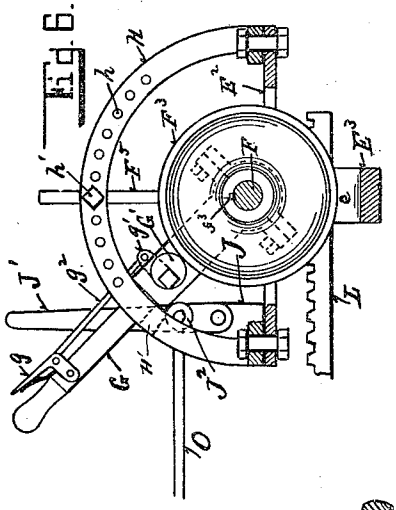


Fig. 8.

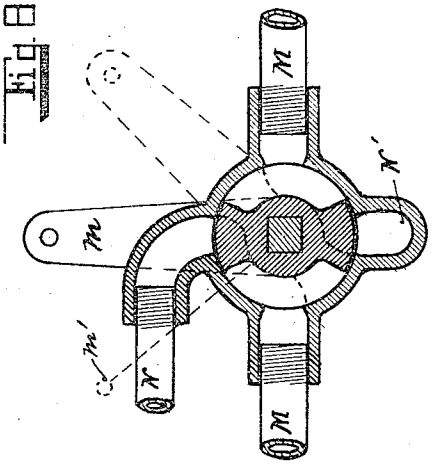


Fig. 5.

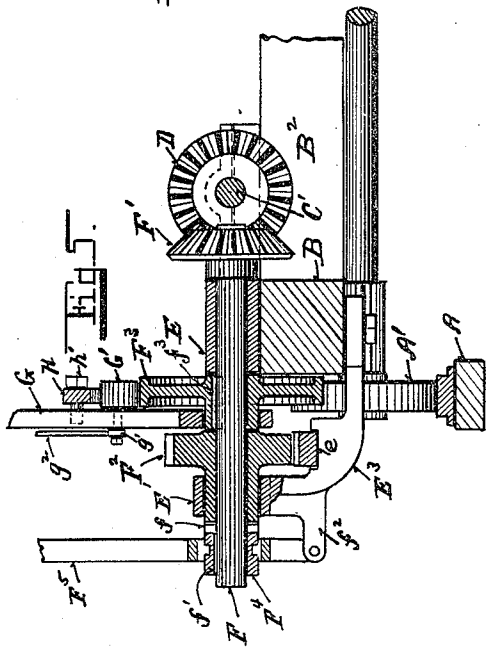
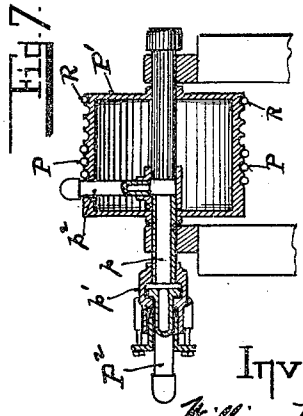


Fig. 7.



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UNITED STATES PATENT OFFICE.

WILLIAM M. WILKIN, OF ERIE, PENNSYLVANIA.

MECHANISM FOR OPERATING SAWMILL SET-WORKS.

1,230,969. Specification of Letters Patent. Patented June 26, 1917.

Application filed December 6, 1915. Serial No. 65,350.

To all whom it may concern:

Be it known that I, WILLIAM M. WILKIN, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Mechanisms for Operating Sawmill Set-Works; 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, forming part of this specification.

My invention relates to saw mill machinery, and more especially to power actuated set-works for saw-carriages.

The objects of my invention are, to devise a power actuated mechanism for installation upon a saw-carriage which can be operated to move the head-block knees forward or backward; and which, when so moving said head-block knees, will maintain a continuous movement thereof until the prescribed distance has been traveled. Also to devise a suitable means by which a power conveying medium may be delivered to the power actuated mechanism installed upon the saw-carriage, and conveyed therefrom.

In constructing mechanism to embody my invention, I provide a cylinder and piston mechanism of sufficient length of travel to move the head-block knees forward sufficiently to saw up logs of the average diameter. This cylinder and piston mechanism I provide with suitable valve mechanism to control the admission and exhaust of a suitable power conveying fluid to and from said cylinder. This cylinder and piston mechanism I secure longitudinally to the side of the saw-carriage opposite the saw side thereof, and I secure to the piston-rod thereof a rack-bar of a length equal to the length of travel of the piston in said cylinder. Upon the frame of the saw-carriage I mount a short transverse shaft, upon which is a spur-gear which intermeshes with said rack-bar, and I secure upon said transverse shaft a miter-gear which intermeshes with a like miter-gear, upon the line-shaft of the saw-carriage, so that when the transverse shaft is rotated by the forward or backward movement of the piston and rack-bar, the said line-shaft will be caused to rotate in unison with said transverse shaft.

In order to deliver a power conveying fluid to said cylinder and piston mechanism, I place adjacent to the side of the saw-carriage, and also adjacent to the termini of the longitudinal travel of the saw-carriage, rotary drums which are provided with tubular axes; the axis of one of said drums communicating with a suitable source of power supply, and the axis of the other drum leading to a desired point of exhaust. From the intake side of the valve mechanism of said cylinder and piston mechanism to the drum which communicates with the source of power supply, I provide a flexible tube, which is wrapped around said drum a sufficient number of times to permit the saw-carriage to move to the opposite extreme of its travel, the said flexible tube being connected with the tubular axis of said drum; and from the exhaust side of said valve mechanism I provide a like flexible tube which is adapted to be wound upon the drum through which the exhaust passes, as the saw-carriage travels toward that drum, the said exhaust tube being connected with the axis of the exhaust drum, and I also provide means, controlled by the longitudinal movement of the saw-carriage, to cause said drums to so revolve, as the saw-carriage moves forward and backward, that the said flexible tubes will be maintained taut.

These and other features of my invention are hereinafter fully described and pointed out and are illustrated in the accompanying drawings, in which:—

Figure 1, is a plan view of a portion of a run-way of a saw-carriage, with a portion of a saw-carriage thereon, provided with set-works mechanism embodying my invention.

Fig. 2, is a side view of the portion of a saw-carriage shown in Fig. 1 and of the run-way thereof, with a portion thereof broken out so as to set one of the drums forward in the drawing.

Fig. 3, is an enlarged side elevation of mechanism embodying my invention.

Fig. 4, is a plan view of the same.

Fig. 5, is a transverse section of the same on the line x, looking in the direction of the arrow z, in Fig. 4.

Fig. 6, is a longitudinal section of the

same on the line y—y looking in the direction of the arrow w, in Fig. 4.

Fig. 7, is a central section of one of the hose drums.

Fig. 8, is a section of a valve adapted for use with my invention.

In these drawings, A indicates one of the wheel tracks of a saw-carriage run-way upon which the wheels A′, under one side B, of a saw-carriage, tread. B indicates a portion of the side-beam of a saw-carriage, opposite the saw side of the carriage (broken away) which is secured to the beam (not shown) on the saw side of the carriage by means of cross-beams, B′, and B^2 B^2, in the usual manner. Upon the side beam B, one end of the usual head-blocks B^3, is placed and secured, upon which the knees C, operate in the usual manner. Journaled in the head-blocks B^3, and cross-beams B^2, there is the usual line-shaft C′, upon which, within the head-blocks B^3, are secured spur-gear wheels C^2, which intermesh with rack-bars C^3, secured to the under edges of the knees, by means of which said knees are forced to travel forward and backward upon the head-blocks B^3, in the usual manner; all of which parts being old and well known in the art. It is also a well known fact that the saw-carriages are caused to travel longitudinally forward and backward upon the track A, in the performance of the function for which they are constructed and therefore mechanism for causing such travel is not shown or described herein.

Upon the line-shaft C′, between the cross-beams B^2, I place a miter-gear wheel D, and in suitable bearings E, and E′, secured upon the side-beam B, of the saw-carriage, I mount a transverse shaft F, (see Figs. 4 and 5) and I secure upon the shaft F, a miter-gear F′, which intermeshes with the miter-gear D, on the line-shaft C′. Upon the shaft F, I place a spur-gear wheel F^2, which is provided with a sleeve hub, one end of which extends outwardly around said shaft F, within the bearing E′, and is provided with an annular series of clutch-teeth f, said spur-gear being rotatable upon said shaft F. Upon the shaft F, inside of the spur-gear F^2, I secure a friction wheel F^3, by means of a key f^3, so that said friction wheel is non-rotatable on said shaft F. The bearings E and E′, are supported by a frame E^2, which is secured upon the side-beam B, of the saw-carriage, and I also preferably provide said frame with a bracket, E^3, under the bearing E′, which curves backward under the spur-gear F^2, and is secured to the under side of the side-beam B.

Upon the shaft F, I place a clutch-collar F^4, which engages the shaft F, by means of a spline f', and groove in the usual manner, said clutch collar having an annular series of clutch-teeth which intermesh with the clutch-teeth f, on the outer end of the sleeve hub of the spur-gear wheel F^2, in the usual manner. I provide a lever F^5, which is pivoted upon an ear f^2, on the bracket E^3, for operating the clutch-collar F^4, which lever is provided with the usual and ordinary mechanism for engaging and operating said clutch-collar to cause it to engage or be disengaged from the clutch-teeth f, on said sleeve-hub of the spur-gear F^2. The bracket E^3, is provided with a slide-surface e, on its upper side under said spur-gear wheel F^2, for the purpose hereinafter set forth.

Mounted upon the hub of the friction wheel F^3, is a lever G, which is provided with an eccentric gripper G′, pivoted thereon and adapted to engage the periphery of the friction wheel F^3, so as to be operated in one direction by said wheel F^3; and upon said lever G, I place a spring-pressed hand-grip lever g, which is connected with a lever g', (see Figs. 3 and 6) non-rotatably secured to the pivot of the eccentric gripper G′, by means of a rod g^2, so that the spring-pressed lever g, operates to normally maintain the eccentric gripper G′, in engagement with the friction wheel F^3. Upon the frame E^2, (see Figs. 3, 4, 5 and 6) I secure a semi-circular gage-bar H, which is provided with a stop H′, to limit the backward movement of the lever G; and said gage-bar H, is also provided with a series of holes h, in which may be placed a stop-pin h', (see Figs. 4, 5, and 6) to limit the forward movement of the lever G. Upon the frame E^2, I secure a bracket J, (see Figs. 3 and 4) upon which is pivoted a lever J′, which lever is provided with a projection or roller J^2, adapted to be engaged by the lever G, on its backward movement.

Upon the side-beam B, I secure a cylinder K, in which there is a piston (not shown) secured to a piston-rod K′, which projects from said cylinder K, through a stuffing-box k, of usual and ordinary construction. Secured to the end of the piston-rod K′, is a rack-bar L, which rests upon the slide surface e, on the bracket E^3, and intermeshes with the spur-wheel F^2. The length of the travel of the piston-rod K′, is preferably sufficient to cause the spur-wheel F^2, and shaft F, to rotate a sufficient number of times to cause the line-shaft C′, to move the knees C, sufficiently backward and forward to saw logs of average size without reversing the travel of the piston-rod K′, and rack-bar L, as hereinafter described. When, however, sufficient travel of the knees C, cannot be had, with one forward or backward movement of the rack-bar L, the lever F^5, is operated to disengage the clutch-collar E^4, and then the rack-bar L, is drawn backward, and the clutch

again closed, when the rack-bar L, may be again operated to move the knees C, farther in the desired direction. From each end of the cylinder K, a pipe M, leads to a valve M′, (see Fig. 8) and from one side of said valve a fluid supply pipe N, leads to a suitable source of supply (not shown) and from the opposite side of said valve an exhaust pipe N′, leads to a point of exhaust (not shown) as hereinafter described. The valve M′, is provided with an operating lever *m*, which, when in the position shown by full lines in Figs. 3 and 8 holds the valve into a neutral position as shown in Fig. 8, so that fluid cannot flow into the pipes M, or out of either end of the cylinder K, and the piston therein will be retained stationary in whatever position it may be, and thereby prevent any movement of the knees C.

The construction of the valve M′, illustrated in Fig. 8 is old and well known, and is only illustrated for the purpose of describing the operation of the mechanism. From the lever *m*, a rod O, extends and is pivoted to the lever J′. This rod O, is provided with a turnbuckle O′, whereby the length of the same may be adjusted in order to regulate the valve M′, so that the valve will be closed and the power completely shut off at the moment the lever G, engages the permanent stop H′. For the purpose of conveying the operative fluid from the source of supply (not shown) to the pipe N, I provide a flexible tube P, which extends from the pipe N, to a drum P′, and is wound around the drum P′, a sufficient number of times to permit the saw-carriage to travel on the track A, to its extreme limit of travel away from the drum P′, before unwinding the entire length of the flexible tube P. The drum is mounted upon a hollow axis *p*, (see Fig. 7) one end of which is closed and the other end thereof being connected by means of a suitable joint *p′*, with a fluid supply pipe P^2, leading to a suitable source of supply. The end of the flexible tube P, on the drum P′, is connected with the hollow axis *p*, of the drum P′, by means of suitable connections p^2, so that fluid introduced into the supply pipe P^2, will flow into the flexible tube P, through the hollow axis *p*, and connections p^2. From the exhaust pipe N′, a flexible tube Q, leads to a duplicate Q′, of the drum P′, and communicates with the exhaust pipe Q^2, in like manner as in the case of the drum P′. In order to maintain the flexible tubes P and Q, wound up around the drums P′ and Q′, I provide a cable-belt R, which passes around both drums, and I secure one side of said belt to the side-beam B, of the saw-carriage by means of clamp-brackets S, S, in which the cable R, is tightly clamped so that as the saw-carriage travels forward and backward upon its track A, the cable R, is caused thereby to rotate the drums P′ and Q′, to wind the flexible tube Q, upon the drum Q′, and unwind the flexible tube P, from the drum P′, and vice versa.

In operation, the grip-lever *g*, is operated to raise the eccentric gripper G′, off of the friction wheel F^3, and the lever G, is moved forward until it contacts with the stop-pin *h′*, when the gripper G′, is allowed to engage the friction-wheel F^3, and the lever G, allowed to remain in that position. The lever J′, is then moved forward into the position thereof shown by broken lines in Fig. 3, which, through the rod O, moves the valve lever *m*, forward from the neutral position as shown by full lines in Figs. 3 and 8, to the position thereof indicated by the broken line *m′*, in Fig. 8, which operates the valve M′, so that fluid flows from the supply pipe N, through the valve and pipe M, leading to the rear end of the cylinder K, behind the piston therein and thereby forces the rack-bar L, forward, which causes the spur-gear F^2, shaft E, and friction wheel F^3, to rotate, and through the miter-gear F′, and D, causing the line-shaft C′, to move the knees C, forward. This movement of the friction wheel F^3, through the eccentric gripper G′ causes the lever G, to move backward to the position thereof shown by full lines in Figs. 3 and 6, during which movement the projecting roller J^2 on the lever J′, is engaged by the lever G, and the lever J′, and the valve lever *m*, moved back to their neutral positions, as indicated by full lines in Fig. 3, which stops the flow of fluid into the cylinder K, behind the piston therein and the forward movement of the rack-bar L, ceases, and all the parts of the mechanism will remain at rest until the operation of the levers G, and J′, is repeated as above described. When, however, the rack-bar L, has reached the limit of its forward travel and it is desired to move the knees C, still farther forward, the clutch-lever F^5, is operated to open the clutch F^4, and the lever J′, is thrown backward to admit fluid into the front end of the cylinder, to draw the rack-bar L, back to the position thereof shown by full lines in Fig. 3, when the clutch F^4, is again closed and the operation above described repeated until the knees have reached the limit of their forward travel, when the piston and rack-bar may be used to draw the knees back to their rearmost position for the reception of another log upon the head-blocks B^3. From the foregoing description of the construction and operation of my invention, it will be evident that I am enabled to move the knees C, forward the desired distances to saw the required thickness of board from a log, with one movement of the rack-bar L, and that the movement of the knees C, forward, is

regulated by the location of the stop-pin h', in the semi-circular bar H, which limits the forward movement of the lever G, so that the mechanism is operated by the rack-bar L, from the time the lever G, leaves the stop-pin h', until it moves the lever J', back into its neutral position. The lever G, is prevented from moving the lever J', back of its neutral position, by the stop H', on the bar H, against which the lever G, normally rests.

Having thus fully described the construction and operation of mechanism embodying my invention, I do not desire to be limited to the exact details thereof shown and described, because many changes therein can be made by those skilled in the art, without departing from the spirit of my invention; but what I claim as new and desire to secure by Letters-Patent, is:—

1. In an apparatus of the class described, the combination of a saw-carriage, a line-shaft mounted therein, a transverse shaft mounted thereon, a pair of intermeshing miter-gears secured on said shafts, a spur-gear mounted on said transverse shaft, a friction wheel secured on said transverse shaft, a manually operatable lever pivoted upon the axis of said transverse shaft, gripper mechanism on said manually operatable lever adapted to engage said friction wheel and move said lever in unison with said friction wheel in one direction, adjustable means to limit the manual movement of said lever in the opposite direction, a lever pivoted on said carriage, means thereon adapted to be engaged by the first-named lever when it is moved by said friction wheel, cylinder and piston mechanism mounted on said saw-carriage, a piston-rod therein, a rack-bar secured to said piston-rod intermeshing with said spur-gear, a valve communicating with said cylinder and piston mechanism adapted to control the admission and exhaust of fluid to and therefrom, a valve operating rod pivoted to said last mentioned lever and adapted to operate said valve when said last mentioned lever is operated, substantially as set forth.

2. In an apparatus of the character described, a saw-carriage run-way, a saw-carriage thereon, a line-shaft mounted in said carriage, cylinder and piston mechanism thereon, means operatable by said cylinder and piston mechanism to rotate said line-shaft, valve mechanism to control admission and exhaust of fluid to and therefrom, a supply pipe connected with one side of said valve, an exhaust pipe connected with the other side of said valve, a rotatable drum mounted adjacent to one end of said run-way, a flexible tube connected with said supply-pipe, and wound around said drum, means to supply fluid to said flexible tube, and means to cause said drum to wind and unwind said flexible tube in unison with the movement of said saw-carriage upon said run-way, substantially as set forth.

3. In a set-works operating mechanism, a shaft, a grip-wheel on said shaft, a lever fulcrumed upon the axis of said shaft, a spring-pressed gripper on said lever adapted to engage said grip-wheel, a spur-gear on said shaft, disengageable means adapted to cause said spur-wheel and grip-wheel to rotate in unison, a rack-bar intermeshing with said spur wheel, piston mechanism to operate said rack-bar, a valve to control the admission and exhaust of fluid to and from said piston mechanism, and mechanism adapted to be operated by said lever to control said valve, substantially as set forth.

4. In a set-works operating mechanism, a shaft, a grip-wheel non-rotatably secured on said shaft, a spur-wheel rotatably mounted on said shaft, a clutch collar slidably and non-rotatably mounted on said shaft and adapted to engage the spur-wheel and cause all of said parts to rotate with said spur-wheel, and rack-bar and piston mechanism to actuate said spur-gear, substantially as set forth.

5. In a set-works operating mechanism, a shaft, a grip-wheel non-rotatably secured thereon, a gage bar above said grip-wheel, a movable gage stop in said bar, a lever pivoted on the axis of said shaft adapted to be manually moved into engagement with said gage-stop, a spring-pressed gripper on said lever adapted to cause said lever to move backward in unison with said grip-wheel, and a valve operating lever adapted to be engaged and operated in one direction by said first named lever, substantially as set forth.

6. In a set-works operating mechanism, a drum, a flexible tube adapted to wind around the same, a hollow axle for said drum, and means to connect said hollow axle to said flexible tube, substantially as set forth.

In testimony whereof I affix my signature.

WILLIAM M. WILKIN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."