No. 896,342. PATENTED AUG. 18, 1908.

T. S. WILKIN, DEC'D.

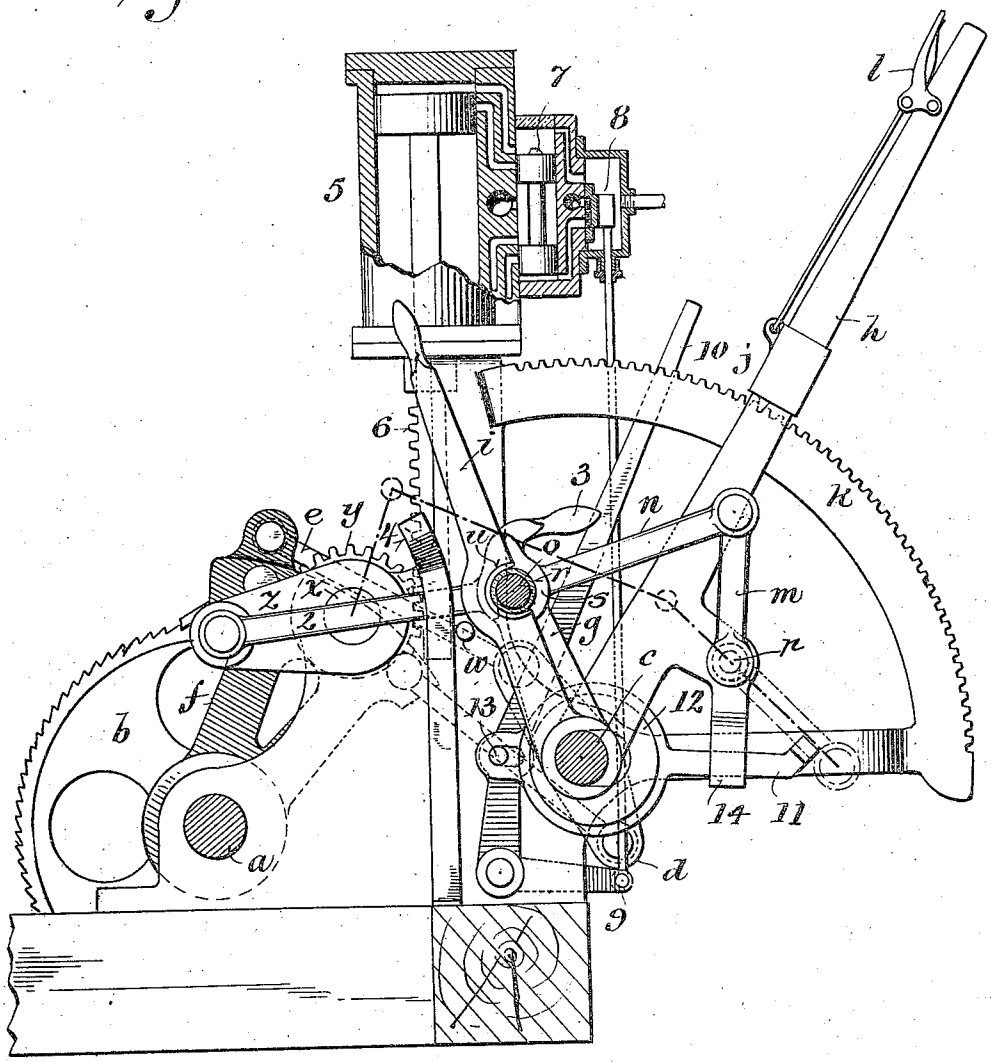
J. B. CARPENTER, ADMINISTRATOR.

SAWMILL SET WORKS.

APPLICATION FILED FEB. 15, 1904.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses
Geo. W. Young.
Chas. L. Goss.

Inventor:
Theodore S. Wilkin,
By Wintter, Rhoades & Smith, Bottum & Coles
Attorneys.

No. 896,342. PATENTED AUG. 18, 1908.

T. S. WILKIN, DEC'D.

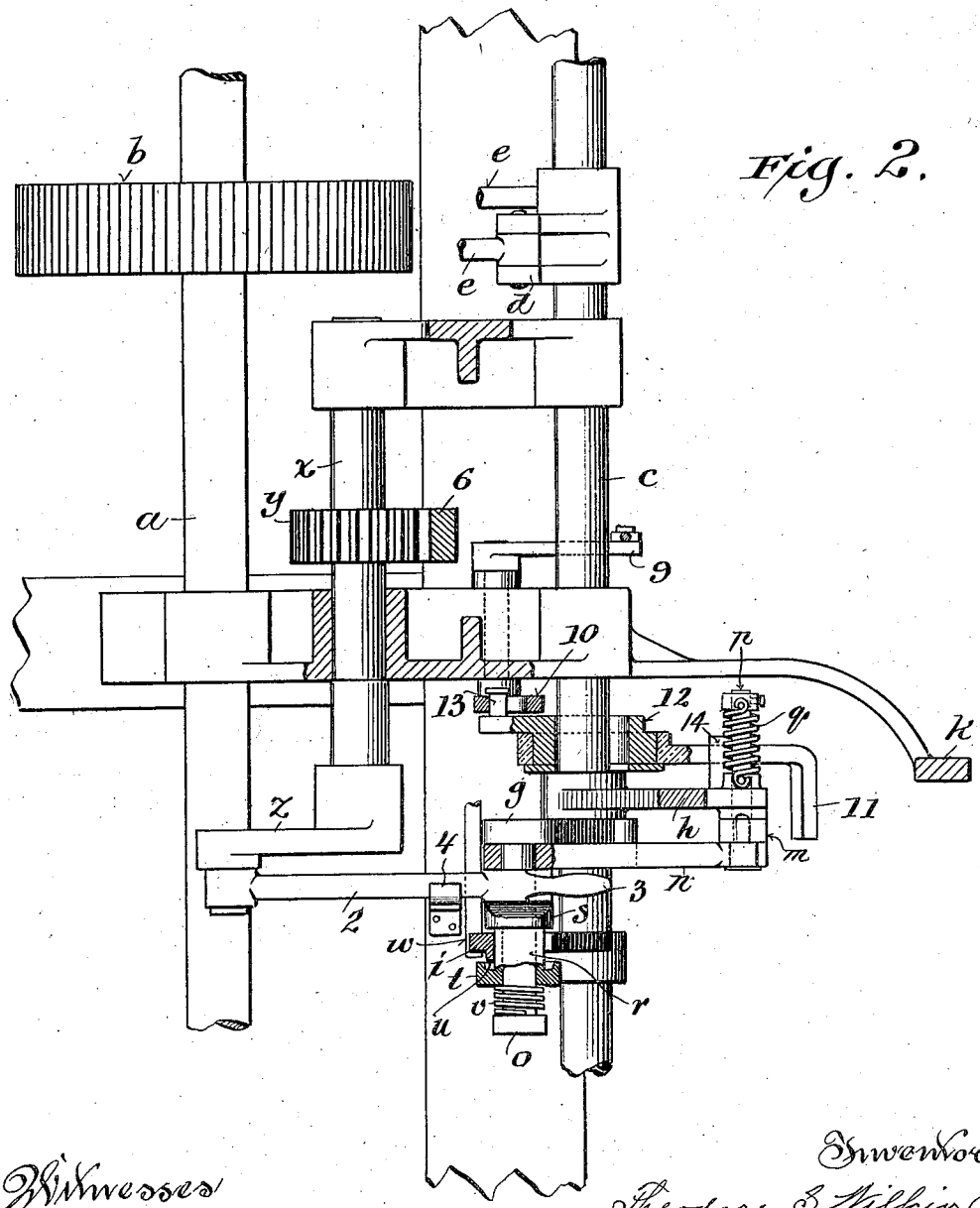
J. B. CARPENTER, ADMINISTRATOR.

SAWMILL SET WORKS.

APPLICATION FILED FEB. 15, 1904.

4 SHEETS—SHEET 2.

Fig. 2.



Witnesses
Geo. W. Young.
Chas. L. Goss.

Inventor:
Theodore S. Wilkin,
By Fickler, Flanders, Smith & Bottum, Solicitors
Attorneys.

No. 896,342. PATENTED AUG. 18, 1908.

T. S. WILKIN, DEC'D.

J. B. CARPENTER, ADMINISTRATOR.

SAWMILL SET WORKS.

APPLICATION FILED FEB. 15, 1904.

4 SHEETS—SHEET 3.

Fig. 3.

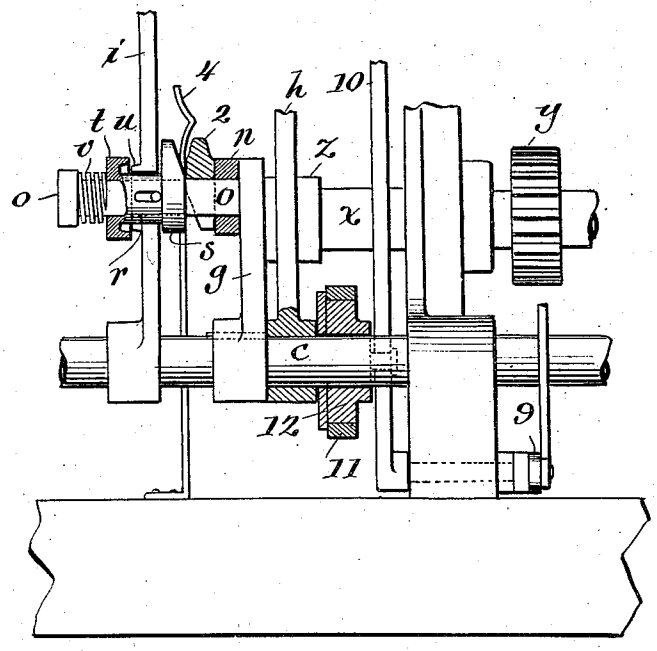
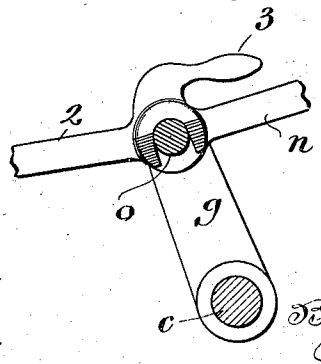


Fig. 4.



Witnesses
Geo. W. Young.
Chas. L. Goss.

Inventor:
Theodore S. Wilkin,
By Whittlesey, Flanders, Smith, Pattison & Dickson
Attorneys.

No. 896,342. PATENTED AUG. 18, 1908.

T. S. WILKIN, DEC'D.

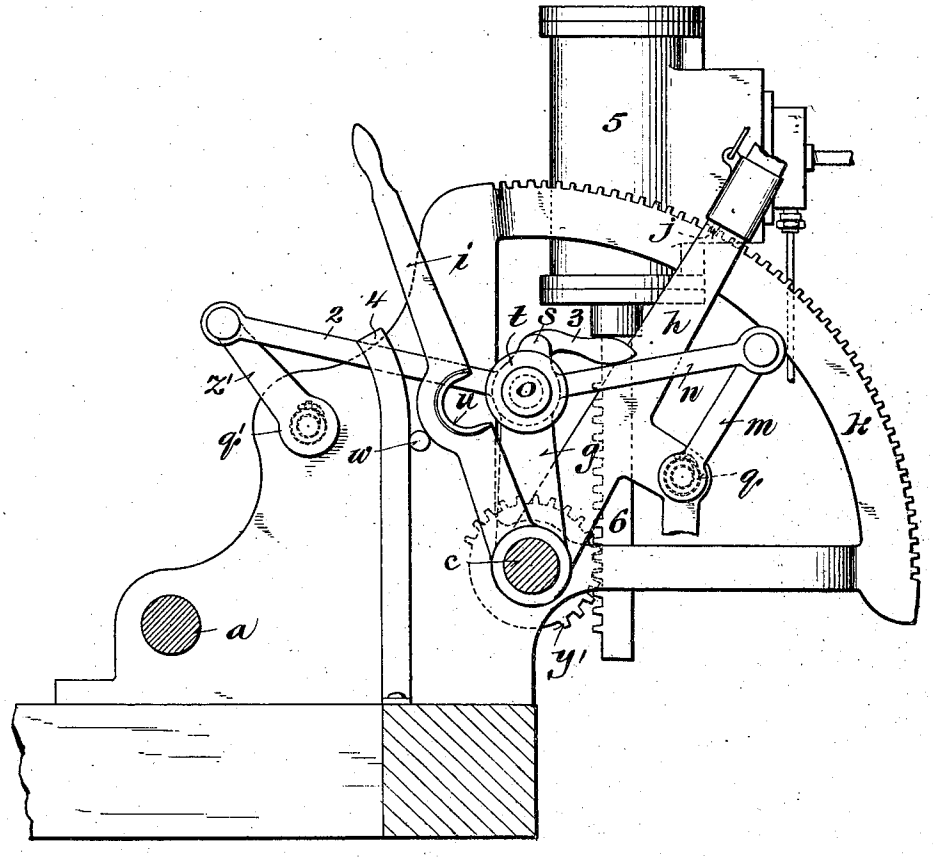
J. B. CARPENTER, ADMINISTRATOR.

SAWMILL SET WORKS.

APPLICATION FILED FEB. 15, 1904.

4 SHEETS—SHEET 4.

Fig. 5.



Witnesses:
Fred Palm.
Chas. L. Goss.

Inventor:
Theodore S. Wilkin,
By Wickliffe Shroyer Smith & Sittman & Klas
Attorneys.

UNITED STATES PATENT OFFICE.

THEODORE S. WILKIN, OF MILWAUKEE, WISCONSIN; JOHN B. CARPENTER ADMINISTRATOR OF SAID THEODORE S. WILKIN, DECEASED.

SAWMILL SET-WORKS.

No. 896,342. Specification of Letters Patent. Patented Aug. 18, 1908.

Application filed February 15, 1904. Serial No. 193,590.

To all whom it may concern:

Be it known that I, THEODORE S. WILKIN, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Sawmill Set-Works, of which the following is a specification, reference being had to the accompanying drawing, forming a part thereof.

This invention relates more particularly to power set-works operated by motors the strokes of whose pistons are varied to vary the set or the advance of the knees. Its main objects are to provide for rapid and accurate "setting" for various dimensions of lumber by preventing overthrow of the knees and shock to the setting mechanism without using positive stops or fluid cushions or checks; to provide for easily and quickly converting a set-works into either a power or a hand operated machine; to produce a complete set by a single manipulation of the motor controlling valve in a double acting machine or a machine whose motor piston returns to its starting point with every complete set; and generally to improve the construction and operation of saw-mill set-works.

The invention consists in certain novel features of construction and in the peculiar arrangement and combinations of the parts or their equivalents hereinafter particularly described and pointed out in the claims.

In the accompanying drawing like characters designate the same parts in the several figures.

Figure 1 is a view partly in end elevation as seen from the bottom of Fig. 2, and partly in vertical cross section, of a power set-works embodying my improvements; Fig. 2 is a view of the same partly in plan and partly in horizontal section; Fig. 3 is a view partly in rear elevation and partly in vertical longitudinal section of a portion of the set-works as viewed from the right with reference to Fig. 2; Fig. 4 is a detail view of the detachable connection for putting the motor in or out of service, and Fig. 5 is a view similar to that of Fig. 1 of a modification.

Referring to the drawing, *a* designates the set shaft provided as usual with a ratchet wheel *b* and geared or otherwise connected with the knees of the head blocks in the usual or any suitable manner.

c is a rocker shaft mounted on the rear side of the carriage parallel with the set shaft and provided with oppositely projecting crank arms *d*, which are connected in the usual way by links *e* with pawl carriers *f*, loosely sleeved on the set shaft on opposite sides of the ratchet wheel *b*. The pawl carriers are provided as usual with suitable pawls adapted to engage with the teeth of the ratchet wheel and turn the set shaft forward, one pawl carrier being advanced and turning the set shaft while the other is withdrawn without effect thereon. The rocker shaft *c* is also provided with a crank arm *g* fixed thereon and with an arm or lever *h* and hand operating lever *i* loosely sleeved thereon on opposite sides of the crank arm *g*. The arm *h* is provided with a detent *j* for locking it in adjusted position to a graduated quadrant *k*, and with a spring actuated hand grip lever *l*, for withdrawing the detent from engagement with the quadrant. A crank *m* is pivoted at one end to the arm *h*, and is connected at the other end by a link *n* with the wrist pin *o* of the crank arm *g*. The pin *p* by which the crank *m* is connected with the arm *h*, is fixed in the crank arm and turns in the arm *h*, and upon its extended end is a torsion spring *q* attached at one end to the arm *h* and at the other end to a collar fixed on the pin, as shown in Fig. 2. This spring tends to turn the crank backward out of line with the link, as hereinafter more fully explained.

The hand lever *i*, which affords means for the manual operation of the set-works, is formed in one side with a semi-circular recess or seat fitting over a sleeve *r*, which is mounted and movable endwise on the wrist pin *o*, and is held from turning thereon by a pin projecting from the wrist pin through a slot in the sleeve as shown in Fig. 3. This sleeve is formed or provided at the end towards the crank arm *g* with a collar *s* and at the other end with a grooved collar or clutch member *t* adapted to engage with a semi-circular flange or projection *u* on the hand lever and to secure said lever to the wrist pin *o*. A spring *v* surrounding the outer end of the wrist pin between a collar or shoulder thereon and the collar or clutch member *t*, tends to force the sleeve *r* towards the crank arm *g*.

w is a stop for arresting and supporting the hand lever in its normal or home position.

x is a shaft located above, between and parallel with the set shaft *a* and rocker shaft

c. It is provided with a pinion *y* and at one end with a crank *z*, which is normally connected by a link 2 with the wrist pin *o*, the link being formed with an open recess or hook and with a handle 3, as shown in Fig. 4, for connecting and disconnecting it with the wrist pin *o*.

4 is a spring rest for supporting the link 2 when it is disconnected from said wrist pin *o*, in position to be readily reëngaged therewith. The collar *s* and the hooked end of the link 2 are beveled on their adjoining faces, as shown in Fig. 3, so that when the link is carried down into engagement with the wrist pin *o* it will force the sleeve *r* against the spring *v* and move the clutch *t* out of engagement with the flange *u* on the hand lever.

5 is the cylinder of a reciprocating motor mounted in the present case in a vertical position above the shaft *x*, although it may be arranged in any other suitable position. The piston rod of the motor is formed or provided with a rack 6, which meshes with the pinion *y*. A piston valve 7 directly controls the admission and release of steam or other motive fluid to and from the ends of the motor cylinder, and an auxiliary valve 8 controls the admission and release of the motive fluid to opposite ends of the valve 7, in this way indirectly controlling the operation of the motor. The stem of the valve 8 is connected with an arm 9 on a shaft provided with a lever 10. A valve reversing arm 11 extending at one end into the path of the crank *m*, has a strap encircling and adapted to turn on a head 12, which is movable transversely upon the rocker shaft *c*, and is connected with the lever 10 by a pin 13 passing loosely through a transverse slot in said lever. The arm 11 is held and guided in the proper working relation to the stop arm *h* and the crank *m* by a branch or offset 14 of the arm *h*.

My improved set-works as hereinbefore described operates as follows: The crank *z* being in its home position, to which it always returns, as shown in Fig. 1, in line with the link 2 connecting it with the crank arm *g*, and the arm *h* being adjusted and secured to the quadrant *k* in position to produce the desired set, steam or other motive fluid is admitted to the upper end of the motor cylinder 5 by throwing the lever 10 to the right with relation to Fig. 1. The piston is thereupon driven downward, turning the cranks *z*, *g* and *m* to the right into positions indicated by dotted lines on Fig. 1, until their movement is arrested by the stop crank *m* being brought into line with the link *n*. As the parts are brought into this position, the crank *m* engages the arm 11, forcing it with the head 12 and lever 10 to the left. This automatically reverses the valves 8 and 7, admitting steam to the lower end of the motor cylinder and releasing it from the upper end thereof. The motor piston is thereupon immediately driven back to the upper end of the cylinder, turning the several cranks *z*, *g* and *m* back to their initial positions and bringing the crank *z* into line with the link 2. In this reverse movement the spring *q* turns the crank *m* back out of line with the link *n* as soon as it is permitted to do so by the action of the motor. On the backward or return movement of the crank arm *g* the spring *q* throws the stop crank *m* out of line with the link *n* or away from its dead center on which it might otherwise be held against the power exerted thereon by the motor or hand lever *i*. The rocker shaft *c* and hence the set shaft *a* and the knees to which motion is communicated by the rocker shaft, comes to a gradual stop at both limits of its movement by reason of the stop crank *m* being brought into line with the link *n* on the one hand, and the crank *z* into line with the link 2 on the other hand. A single movement of the valve controlling lever 10 by the operator thus suffices to produce a double reciprocation, a forward and back movement of the crank arm *g* and rocker shaft *c*, and a complete set of the knees without further care or attention upon his part. Overthrow of the knees due to momentum of the parts of the set-works, and shocks and injury to the setting mechanism incident to the employment of positive stops, are prevented by the employment of crank and link connections which retard the movement of the crank arm *g* and rocker shaft at both limits, whatever the extent of its movement may be. The cranks *z* and *m* may pass to a considerable extent beyond their dead centers, at which they are in line with the links 2 and *n*, without producing any appreciable movement of the rocker shaft *c*, so that exact limits to the movement of the motor piston are not required for accurate setting.

The setting mechanism is so constructed and its parts are so arranged that when the arm *h* is set at the upper limit of its adjustment, the crank *m* will be approximately in line with the link *n* when the crank arm *g* is in its home position, and no movement of the rocker shaft can be effected either by the motor or hand lever.

By adjusting the arm *h* towards the lower end of the quadrant *k*, the amplitude of vibration of the crank arm *g* is increased and the mechanism is set for cutting lumber of various dimensions from the thinnest to the thickest.

In case for any reason it is desired to operate the set works by hand, the motor is quickly and easily disconnected and the hand lever *i* connected with the crank arm *g* by simply lifting the link 2 out of engagement with the wrist pin *o*, whereupon the spring *v* will force the clutch *t* into engagement with the flange *u* on said lever, thereby locking the lever with said crank arm. The

movement of the hand lever in setting by hand is varied for cutting lumber of different dimensions by the adjustment of the arm *h* and crank *m*, as above explained, a complete to and fro movement or double throw of said lever being required for each complete set and the lever being always returned to its home position against the fixed stop *w*. In this position the motor is connected and the hand lever disconnected with the crank arm *g* by simply lowering the link 2 into working position in engagement with the wrist pin *o*.

Various changes in details of construction and arrangement of parts may be made without departing from the principle and intended scope of the invention. For example, the motor may be connected either directly or indirectly with the rocker shaft or other part of the set works without materially affecting its operation, the cranks *m* and *z* serving in either case to arrest the movement of the set-works in both directions at exactly predetermined limits without shock to the mechanism or overthrow of the set shaft and knees.

In Fig. 5 the motor is shown as connected directly with the rocker shaft *c* by the rack 6 and pinion *y'*. The crank arm *z'*, serving in this case simply as a stop, has a spring *q'*, like that connected with the crank *m*, tending to turn it backward from its dead center or out of line with the link 2. In other respects the mechanism is in construction and operation substantially like that shown in the other figures of the drawing, except that no means for disconnecting the motor from the set works are shown.

I claim:

1. In a saw-mill set-works the combination with the set shaft of a rocker shaft provided with a crank arm, means for imparting movement to the set shaft from said rocker shaft, and a stop crank connected with said crank arm by a link which is adapted to be brought into line with said stop crank at one limit of the movement of said crank arm, substantially as described.

2. In a saw-mill set-works the combination with the set shaft of a rocker shaft provided with a crank arm, means for imparting movement to the set shaft from said rocker shaft, and stop cranks connected with said crank arm by links and arranged to come into line with said links at the limits of the movement of said crank arm in opposite directions, substantially as described.

3. In a saw-mill set-works the combination with the set shaft, a rocker shaft for imparting motion thereto and means for actuating the rocker shaft, of a stop crank having an adjustable supporting bearing and connected by a link with said rocker shaft, substantially as described.

4. In saw-mill set-works the combination with the set shaft, and a movable member for imparting motion thereto, of a motor for actuating said movable member, and stop cranks connected with said member by links which are arranged to be brought into line with said cranks at the limits of the movement of said member, one of said stop cranks being adjustable to vary the extent of movement of said member, substantially as described.

5. In saw-mill set-works the combination with the set shaft, and a motor for actuating said set shaft, of an adjustable arm, a crank pivoted to said arm and connected with the setting mechanism by a link which is arranged to be brought into alinement with said crank at the variable limit to the movement of the motor, substantially as described.

6. In saw-mill set-works the combination with the set shaft of a motor and a hand lever for actuating the same, a rocker shaft for communicating movement from the motor or hand lever to the set shaft provided with a crank arm, and means for simultaneously connecting the motor and disconnecting the hand lever with said crank arm and vice versa, substantially as described.

7. In saw-mill set-works the combination with the set shaft, and a rocker shaft for imparting motion to the set shaft provided with a crank arm, a hand lever having its fulcrum concentric with the rocker shaft, a motor having a link for connecting it with the crank arm of the rocker shaft, and means for connecting either said hand lever or said link with said crank arm, substantially as described.

8. In saw-mill set-works the combination with the set-shaft, and a rocker shaft for imparting motion to the set shaft, of a motor and a hand lever for actuating said rocker shaft, a crank arm fixed on said rocker shaft and having a wrist pin provided with a spring actuated clutch for connecting the hand lever therewith, and a hooked link adapted to connect the motor with said crank arm and when engaged with its wrist pin to disengage the clutch and release the wrist pin from the hand lever, substantially as described.

9. In saw-mill set-works the combination with the set shaft, of a rocker shaft provided with a crank arm for imparting motion to the set shaft, a driving crank connected by a link with the crank of the rocker shaft and standing in its home position in line with said link, a motor connected with the driving crank, and an adjustable arm provided with a crank which is connected by a link with the crank arm of the rocker shaft and is arranged to be brought into line with said link at the variable limit of the movement of the rocker shaft, substantially as described.

10. In saw-mill set-works the combination with the set shaft, of a reciprocating member for imparting a variable movement to the set

shaft, an adjustable arm provided with a crank which is connected by a link with said member and is brought into line with the link at the variable limit of the movement of said member, and a spring tending to throw said crank back out of line with said link, substantially as described.

11. In saw-mill set-works the combination with the set shaft, of a rocker shaft provided with a crank arm for imparting motion to the set shaft, a driving crank, a motor connected with said crank, a link for connecting the driving crank with the crank arm on the rocker shaft adapted to stand in line with the driving crank when it is in home position, a hand lever having its fulcrum concentric with the rocker shaft and standing parallel with said crank arm in home position, a home stop for said lever, means for securing said lever to said crank arm, and an adjustable arm having a crank which is connected by a link with said crank arm and is brought into line with said link at the variable limit of the movement of said rocker shaft, substantially as described.

12. In saw-mill set-works the combination with the set shaft, of a reciprocating member for imparting motion to the set shaft, a graduated quadrant, an adjustable arm having a detent for locking it to said quadrant, and a stop crank pivoted to said arm and connected by a link with said reciprocating member, substantially as described.

13. In saw-mill set-works the combination with the set shaft, of a rocker shaft for imparting motion thereto provided with a crank arm, a driving shaft provided with a crank which is connected by a link with said crank arm and stands in its home position in line with said link, a reciprocating motor having a rack and pinion connection with said driving shaft, a graduated quadrant, an adjustable arm having a detent for locking it to said quadrant and provided with a pivoted crank which is connected by a link with the crank arm on the rocker shaft and is brought into line with said link at the variable limit of the movement of said crank arm, and a spring tending to throw said stop crank back out of line with said link, substantially as described.

14. In saw-mill set-works the combination with the set shaft, of a reciprocating motor for actuating the same, a valve controlling the supply of motive fluid to said motor, an adjustable stop for limiting the movement of the motor and varying the set, and means connected with said stop for automatically shifting said valve and reversing the movement of the motor, substantially as described.

15. In saw-mill set-works the combination with the set shaft, of a reciprocating motor, a valve controlling the supply of motive fluid to the motor, connections for imparting motion from the motor to the set shaft, a lever connected with said valve, an adjustable stop crank connected with a member of said power transmitting connections, and an arm connected with the valve lever and adjustable with the stop crank for automatically reversing the motor at the variable limit of its movement, substantially as described.

In witness whereof, I hereto affix my signature in presence of two witnesses.

THEODORE S. WILKIN.

Witnesses:
ELINOR V. WRIGHT,
CHAS. L. GOSS.