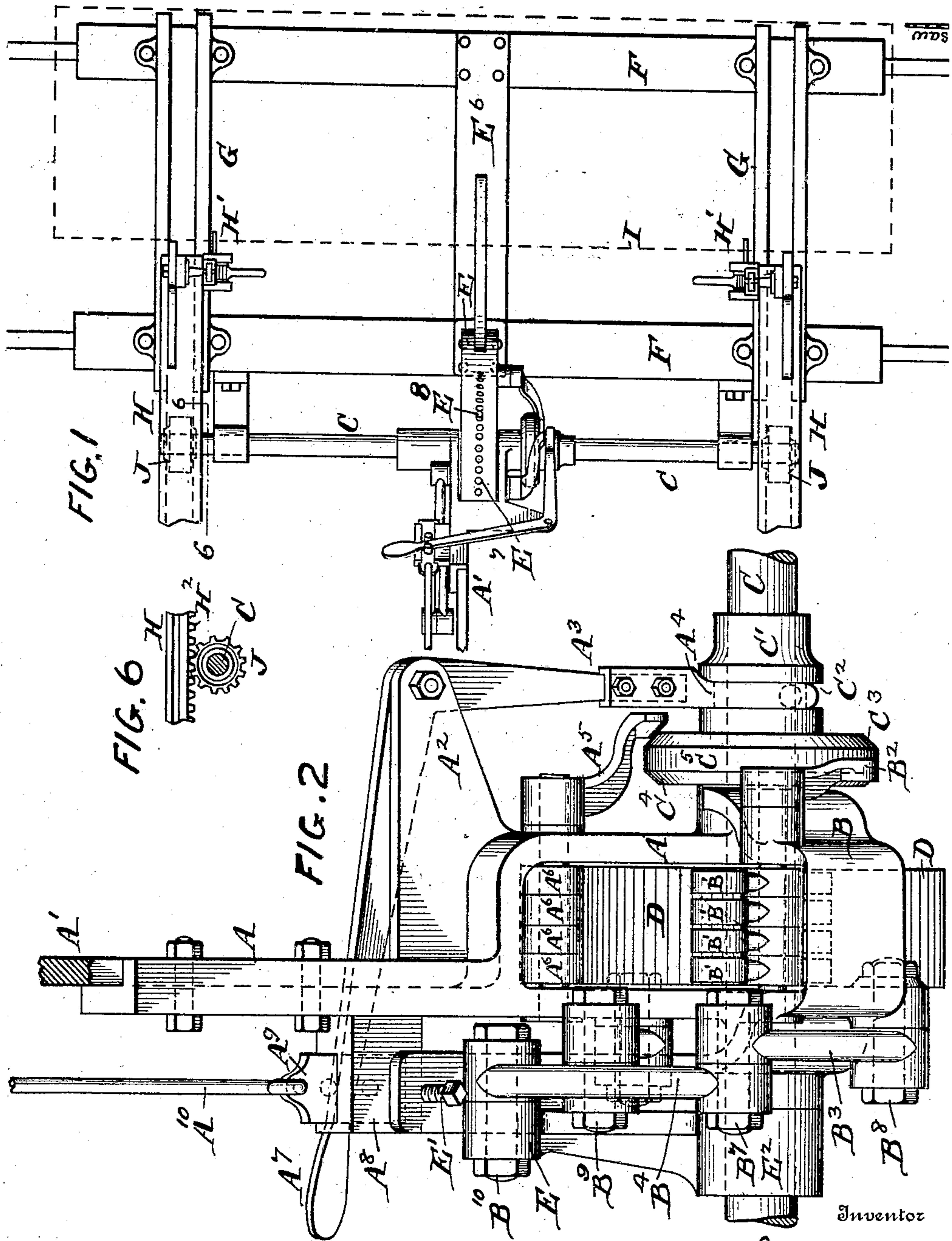


H. M. LOFTON.
 SET WORKS FOR SAWMILLS.
 APPLICATION FILED FEB. 29, 1908.

915,198.

Patented Mar. 16, 1909.

2 SHEETS—SHEET 1.



Witnesses
 Daniel Webster, Jr.
 R. M. Kelly.

Herbert M. Lofton

[Signature]

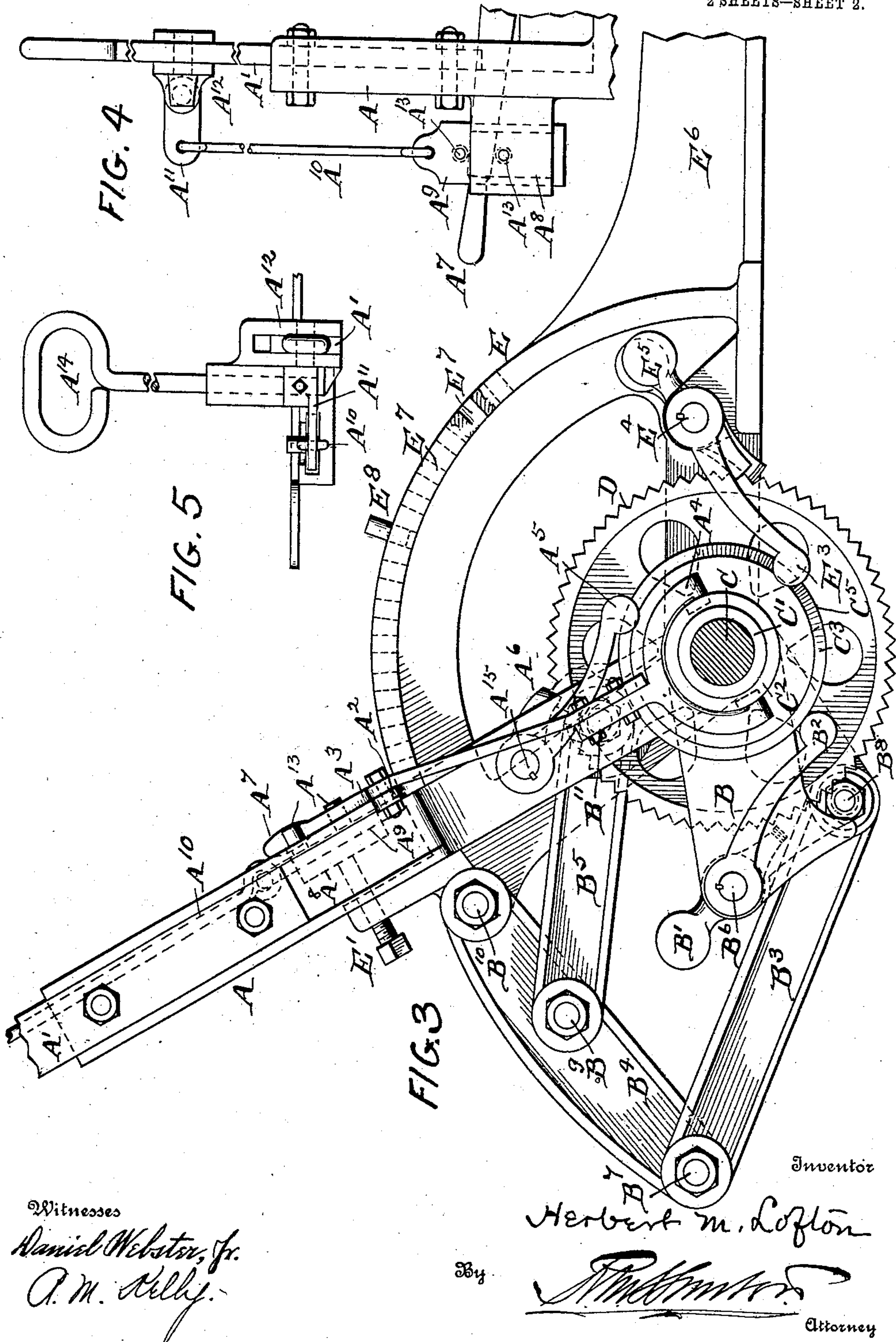
Attorney

H. M. LOFTON.
SET WORKS FOR SAWMILLS.
APPLICATION FILED FEB. 29, 1908.

915,198.

Patented Mar. 16, 1909.

2 SHEETS—SHEET 2.



Witnesses
Daniel Webster, Jr.
A. M. Kelly.

Inventor
Herbert M. Lofton
By *[Signature]*
Attorney

UNITED STATES PATENT OFFICE

HERBERT M. LOFTON, OF ATLANTA, GEORGIA.

SET-WORKS FOR SAWMILLS.

No. 915,198.

Specification of Letters Patent.

Patented March 16, 1909.

Application filed February 29, 1908. Serial No. 418,413.

To all whom it may concern:

Be it known that I, HERBERT M. LOFTON, a citizen of the United States, and a resident of the city of Atlanta, county of Fulton, and State of Georgia, have invented an Improvement in Set-Works for Sawmills, of which the following is a specification.

My invention has reference to set works for sawmills, and consists of certain improvements which are fully set forth in the following specification, and shown in the accompanying drawings, which form a part thereof.

The object of my invention is to provide means whereby the knees may be intermittently moved toward the saw so as to feed the log or piece of timber toward the saw a definite distance with each stroke of the operating lever, that boards of predetermined thickness may be sawed from the log; said means also having capacity for causing the knees to be receded more quickly than they were fed forward, so as to reduce to a minimum the time necessary for the reception of another log or piece of timber.

My invention has particular reference to the mechanical devices which are adapted to operate the knees of a "set works" and which control and regulate their adjustment that they may be moved intermittently, slowly toward the plane of the saw and rapidly in the reverse direction.

My invention consists in a shaft for operating the knees of a "set works", combined with a hand operated rocking lever, power devices operated by the lever for imparting to the shaft intermittent rotations of small arcs, power devices operated by the lever for imparting to the shaft intermittent rotations of large areas, and means for putting either of the power devices into operation at one time, whereby the shaft may be intermittently rotated slowly in one direction or intermittently rotated fast in the other direction.

My invention also consists of a shaft for operating the knees and having a ratchet wheel, combined with a pivoted lever having a pawl engaging the ratchet wheel, a second pawl for operating the ratchet wheel in the opposite direction and operating mechanism connecting with the lever for imparting a long travel to the pawl, and means for engaging one pawl with the ratchet wheel to give an intermittent slow rotation or the other pawl with the ratchet

wheel to impart an intermittent rapid rotation.

My invention also consists in the features above stated when further combined with means for regulating the extent of throw of the lever to control the extent of rotation with each intermittent action.

My invention also comprehends details of construction which, together with the features above specified, will be better understood by reference to the drawings, in which:

Figure 1 is a plan view of the carriage of a sawmill having my improved set works applied thereto; Fig. 2 is a rear elevation of the set works; Fig. 3 is a side elevation of the set works with the upper end of the lever broken away; Fig. 4 is a rear elevation of a portion of the set works showing the lever and connections; Fig. 5 is a plan view of the upper end of the lever; and Fig. 6 is a sectional view of Fig. 1 on line 6—6.

This invention is a device for feeding the log or timber to be sawed toward the saw and for receding after the cut has been finished, and commonly known as "set works". It is mounted on the set shaft C of the carriage F and has direct connection with the knees H by means of pinions J, which in turn work in racks H² on the under side of the knees, thus allowing the knees to work outwardly, or to recede in accordance with the direction in which the set shaft is revolving. The knees have any suitable means H' for holding the logs or timber I, and are adjustable along the head-blocks G upon which the log or timber also rests as indicated in dotted lines.

C is the set shaft, the same being connected at the two outer ends with the pinions J previously mentioned.

D is a ratchet wheel which is secured to the set shaft C.

A, A' is the combined operating lever and yoke for carrying the upper set of pawls A^o. The lower ends of the yoke A work freely on set shaft C as a fulcrum. This yoke, in addition to carrying the pawls A^o, straddles ratchet wheel D.

B is the lower yoke which carries the lower set of pawls B' and is pivoted to the shaft C so as to work freely thereon.

E is a quadrant, and is made fast to the carriage F at E^o. The quadrant is bored and the set shaft C passes through so as to rotate freely.

The yoke A of the operating lever is pro-

vided with a standard A^2 for supporting the bell crank A^3 having a handle A^7 and which connects with the stop latch A^9 at one end and at the other end with a fork A^4 . The
 5 fork A^4 is trunnioned in the groove C^2 of the moving collar C' for shifting it upon the shaft C .

A^5 is a lifting finger connected to the pawl shaft A^{15} , carrying the upper pawls A^6 .

10 A^8 is a guide for the stop latch A^9 , and is cast on the yoke A . The stop latch A^9 is connected to the operating handle A^{14} by means of the crank A^{11} and the connecting rod A^{10} , which is best shown in Figs. 4 and
 15 5. Pins A^{13} on latch A^9 operate the lever A^3 .

The yoke B previously described carries the pawls B' and mounted on the pawl shaft B^6 is a lifting finger B^2 and by means of
 20 which the pawls are lifted out of the notches on the ratchet wheel D when the collar C' and its cams are shifted.

B^3 is a connecting link or rod hinged at one end at B^8 with the yoke B , and at the other
 25 end is connected to the compounding lever B^4 , as indicated at B^7 . The compounding lever B^4 connects at the lower end at B^7 with the lever B^3 and at the upper with the quadrant E , as indicated at B^{10} . This lever
 30 B is also connected at an intermediate position B^9 with the connecting rod B^5 , which rod in turn is connected to the yoke A , as indicated at B^{11} .

The sliding collar C' on the set shaft has
 35 its movement controlled by the bell crank A^3 and its fork A^4 , and at its enlarged end it is provided with a double cone surface C^3 and C^4 , and an intermediate cylindrical surface C^5 . The object of this arrangement is
 40 to operate the lifting fingers to raise the various sets of pawls out of the ratchet wheel notches as may be desired, the same being automatically controlled by a twist of the handle A^{14} , before referred to.

45 E is a quadrant, which in its main adaptation has already been referred to. It is provided with a stop E' for limiting the throw of the controlling lever A' in one direction. The lower horizontal end of the quadrant is
 50 hubbed and bored at E^3 to form a bearing in which the set shaft C may work freely. The quadrant is provided with a series of holes E^7 into any of which the stop pin E^8 may be placed to limit the forward throw of the lever
 55 A' and its yoke A . The position of this pin E^8 determines the thickness of the board or timber sawed with each throw of the lever.

E^3 is a lifting finger connected to the pawl shaft E^4 , which works freely in standards
 60 cast on the quadrant E and carries the pawls E^5 . These pawls E^5 are stop pawls and employed to hold the set shaft against backward rotation and hence hold the knees and log up to the saw during the sawing opera-
 65 tion.

By my improved apparatus, the log may be fed up to the saw intermittently so that boards or timbers of definite thicknesses may be sawed at each operation of the lever A' . This forward feeding is made positive by the
 70 use of the locking pawls E^5 which prevent backward rotation of the set shaft when the lever is thrown back preliminary to a further advance of the log. The forward feeding is
 75 accomplished by the pawls A^6 directly by the yoke A of the hand lever, and hence the shaft C is rotated only through relatively small arcs with each reciprocation of the lever, but the power applied is a maximum because the
 80 work to be accomplished is greatest. When, however, the sawing is finished and the apparatus is to be readjusted to the original position to take on a new log or timber, the work
 85 being light and time being a factor of economy, the pawls A^6 and E^5 are thrown out of contact with the ratchet wheel D and the
 90 pawls B' put into action, with the result primarily of rotating the set shaft backward and secondly of doing this rotation at a greater speed than the forward speed, this lat-
 95 ter action being accomplished by the greater throw of the yoke B and its pawls B' because of the leverage secured through the lever B^4 . While this increased speed in the backward
 100 movement puts more leverage upon the operator, this is immaterial, because the work to be accomplished, or resistance to be overcome, is much smaller on the return move-
 105 ment than on the forward movement.

I will now more fully describe the opera-
 100 tion of the apparatus: The lever A' is moved to the right (Fig. 3), which in actual operation, would be toward the saw, and this is done by the operator pulling the handle A^{14}
 105 over. The operator may occupy a position on the mill floor directly in front of the saw, and the rod of the handle A^{14} may be made sufficiently long to reach to him. The same
 110 operation may be done by gripping the lever A' while standing on the sawmill carriage. This movement of the lever A' will cause the log to be pushed toward the saw by
 115 means of pawls A^6 engaging in the ratchet wheel D . The log can be pushed toward the saw as far as may be necessary by repeated movements of this lever. It will be
 120 noticed from Fig. 3 that the pawls B' carried by the lower yoke B are held out of position on the ratchet wheel by means of lifting finger B^2 riding on cylindrical surface C^5 of the
 125 sliding collar C' . It will also be noticed that the stop pawls E^5 are in active working order so that the ratchet wheel will be held in position as it is rotated to the right. After the
 130 timber has been cut, and it is desired to recede the knees preparatory to rolling on another log, the handle A^{14} is twisted so that the parts A^{11} , A^{10} and A^9 will operate the bell
 135 crank A^3 to shift the collar C' on the set shaft C . The shifting of the collar raises the lift-

ing fingers A⁵ and E³ so that they will lift their respective set of pawls entirely out of the ratchet wheel notches, and at the same time allow the lifting finger B³ to move toward the set shaft and permit the pawls B' to drop into the ratchet wheel notches and become active for the reverse movement of the set shaft. The operation of the lever A' now recedes the head-block, as has been previously described. It will be seen that the same movement of the lever A' to the right will, by means of the connecting rod B⁵, the compounding lever B⁴, and the lower connecting rod B³, and the yoke B, rotate the ratchet wheel in the opposite direction, which will of course recede the head-blocks. By means of the connecting rod B⁵, compounding lever B⁴, and lower connecting rod B³, this receding movement is accelerated very much as compared with the forward movement of the knees. The extent of this acceleration is determined by the location of the intermediate connection as indicated at B⁹. In other words, this feature embraces a very desirable structure in sawmills. It will be seen also that by means of the handle A¹⁴ which is arranged to stand at right angles to the lever A', the saw operator, who usually stands in front of the saw, can operate this set works, both in feeding forward and receding just as well as if he stood on the sawmill carriage. If the set works be operated by standing on the carriage and moving the lever A', to set up and recede, then the lower handle A' for moving the collar C' may be directly operated by hand.

I have shown multiple pawls A⁶ E⁵ and B', each set comprising four pawls of slightly different length and adapted to engage the same ratchet wheel, so that one of each set will be sure to engage; and by adjustment of the pin A⁸ and the adjustable stop E', an accurate operation of the pawls and ratchet wheel may be had to eliminate all appreciable lost motion and back-lash and thereby insure accurate cutting as to thickness of the boards.

I have described my invention in the form I have found most suitable for commercial use; but while I prefer the construction shown, I do not restrict myself to the details as they may be modified without departing from the spirit of my invention.

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

1. In a set works for sawmills, the set shaft for operating the head-blocks, combined with a hand operated lever, devices for rotating the set shaft forward a portion of a revolution with each reciprocation of the hand operated lever, power devices for intermittently rotating the set shaft backward, lever connections between the last mentioned power devices and the hand operated lever

whereby the set shaft is given a greater backward rotation with each reciprocation of the hand operated lever than the forward rotation, and means for putting either of the power devices into operative connection with the set shaft.

2. In a set works for sawmills, the set shaft for operating the head-blocks, combined with a hand operated lever, devices for rotating the set shaft forward a portion of a revolution with each reciprocation of the hand operated lever, means for preventing the backward rotation of the set shaft, power devices for intermittently rotating the set shaft backward, lever connections between the last mentioned power devices and the hand operated lever whereby the set shaft is given a greater backward rotation with each reciprocation of the hand operated lever than the forward rotation, and means for putting either of the power devices into operative connection with the set shaft and for throwing the means for preventing the backward rotation of the set shaft out of operation when the power devices for the backward rotation of the set shaft are put into operative connection.

3. In a set works for sawmills, the set shaft for operating the head-blocks, combined with a hand operated lever, means for adjusting the throw of the hand operated lever, devices for rotating the set shaft forward a portion of a revolution with each reciprocation of the hand operated lever, power devices for intermittently rotating the set shaft backward, lever connections between the last mentioned power devices and the hand operated lever whereby the set shaft is given a greater backward rotation with each reciprocation of the hand operated lever than the forward rotation, and means for putting either of the power devices into operative connection with the set shaft whereby the forward adjustment of the head-blocks is slow and the backward adjustment is accomplished much more quickly.

4. In a set works for sawmills, the combination of the set shaft for operating the head-blocks, a hand lever, a ratchet wheel secured to the set shaft, a pawl operated by the hand lever for rotating the ratchet wheel and set shaft forward, a rocking frame, a pawl carried by the rocking frame and arranged to rotate the ratchet wheel and set shaft in a backward direction, lever connections for operating the rocking frame from the hand lever, and hand controlled means for throwing either pawl out of operation whereby the rocking of the hand lever may rotate the set shaft forward or backward as desired.

5. In a set works for sawmills, the combination of the set shaft for operating the head-blocks, a hand lever, a ratchet wheel secured to the set shaft, a pawl operated by the hand

lever for rotating the ratchet wheel and set shaft forward, a rocking frame, a pawl carried by the rocking frame and arranged to rotate the ratchet wheel and set shaft in a backward direction, lever connections for operating the rocking frame from the hand lever and imparting to the pawl it carries a greater range of travel than that of the pawl operated by the lever for the forward rotation of the set shaft, and hand controlled means for throwing either pawl out of operation whereby the rocking of the hand lever may rotate the set shaft forward or backward as desired and the backward rotation will be at a greater speed than the forward rotation with each reciprocation of the hand operated lever.

6. In a set works for sawmills, a set shaft, combined with two frames pivoted concentrically with the shaft, means for rocking one of said frames, connecting means between the two frames whereby they are rocked simultaneously but through arcs of different degrees, separate devices operated by the respective pivoted frames for rotating the set shaft in opposite directions, and means for putting either of the separate devices into or out of operative connection.

7. In a set works for sawmills, a set shaft, and a ratchet wheel on the set shaft, combined with two frames pivoted concentrically with the shaft, means for rocking one of said frames, connecting lever devices between the two frames whereby they are rocked simultaneously but through arcs of different degrees, separate pawls operated by the respective pivoted frames for rotating the set shaft and ratchet wheel in opposite directions, and means for putting either of the pawls into or out of operative connection.

8. In a set works for sawmills, a set shaft for operating the head-blocks, combined with two movable frames, continuously connecting means between the frames whereby they move simultaneously but to different extents, means for transmitting motion from the frame of smallest movement to the set shaft to rotate it forward to feed the head-blocks toward the saw, means for transmitting motion from the frame of largest movement to the set shaft to rotate it backward to feed the head-blocks away from the saw, hand operated means to reciprocate the movable frames, and devices independent of the movement of the movable frames for throwing either of the means for transmitting motion into or out of operation, whereby the set shaft may be rotated forward at a slow rate of speed and be rotated backward at a fast rate of speed.

9. In a set works for sawmills, a set shaft for operating the head-blocks, combined with two movable frames, continuously connecting means between the frames whereby they move simultaneously but to different ex-

tents, means for transmitting motion from the frame of smallest movement to the set shaft to rotate it forward to feed the head-blocks toward the saw, means for transmitting motion from the frame of largest movement to the set shaft to rotate it backward to feed the head-blocks away from the saw, means for preventing the set shaft from rotating backward, hand operated means to reciprocate the movable frames, and devices independent of the movement of the movable frames for throwing either of the means for transmitting motion into or out of operation and also for throwing the means for preventing the set shaft from rotating backward out of action when it is desired to rotate the set shaft backward, whereby the set shaft may be rotated forward at a slow rate of speed and be rotated backward at a fast rate of speed.

10. In a set works for sawmills, the set shaft having a ratchet wheel secured to it, combined with a pivoted hand lever, a pawl moved by the lever for engaging the ratchet wheel for rotating it in a forward direction, a pawl also receiving movement from the hand lever for engaging the ratchet wheel for rotating it in a backward direction, a collar sleeved upon the shaft and having two cam parts, fingers respectively connecting with the two pawls for operating them and adapted to be operated by the respective cam parts of the collar whereby when one pawl is thrown into engagement with the ratchet wheel the other pawl is thrown out of engagement and vice versa, and a lever structure for shifting the collar hinged to the hand lever.

11. In a set works for sawmills, the set shaft having a ratchet wheel secured to it, combined with a pivoted hand lever, a pawl moved by the lever for engaging the ratchet wheel for rotating it in a forward direction, a pawl also receiving movement from the hand lever for engaging the ratchet wheel for rotating it in a backward direction, a collar sleeved upon the shaft and having two cam parts, fingers respectively connecting with the two pawls for operating them and adapted to be operated by the respective cam parts of the collar whereby when one pawl is thrown into engagement with the ratchet wheel the other pawl is thrown out of engagement and vice versa, a lever structure for shifting the collar hinged to the hand lever, a handle connecting with the hand lever and extending laterally therefrom for moving it, and connecting devices between the handle and lever structure whereby the parts may be operated from a distance.

12. In a set works for sawmills, the set shaft having a ratchet wheel secured to it, combined with a pivoted hand lever, a pawl moved by the lever for engaging the ratchet wheel for rotating it in a forward direction, a

pawl also receiving movement from the hand lever for engaging the ratchet wheel for rotating it in a backward direction, a collar sleeved upon the shaft and having two cam parts, fingers respectively connecting with the two pawls for operating them and adapted to be operated by the respective cam parts of the collar whereby when one pawl is thrown into engagement with the ratchet wheel the other pawl is thrown out of engagement and vice versa, a lever structure for shifting the collar hinged to the hand lever, means for stopping the back rotation of the set shaft when the forward propelling pawl is in operation, and devices for controlling said means operated by the cam part of the collar.

13. In a set works for sawmills, the set shaft having a ratchet wheel secured to it, combined with a pivoted hand lever, adjusting means to vary the limit of movement of the pivoted hand lever, a pawl moved by the lever for engaging the ratchet wheel for rotating it in a forward direction, a pawl also receiving movement from the hand lever for engaging the ratchet wheel for rotating it in a backward direction, a collar sleeved upon the shaft and having two cam parts, fingers respectively connecting with the two pawls for operating them and adapted to be operated by the respective cam parts of the collar whereby when one pawl is thrown into engagement with the ratchet wheel the other pawl is thrown out of engagement and vice versa, and a lever structure for shifting the collar hinged to the hand lever.

14. In a set works for sawmills, the set shaft, combined with a hand lever mounted concentric to the shaft, means for adjusting the possible oscillations of the lever, and means for rotating the set shaft with a slow speed forward and a quick speed backward, said means consisting of a single ratchet wheel secured to the shaft, a pawl device forming a direct power transmitting connection between the hand lever and the ratchet

wheel for rotating it in a forward direction with a slow speed, a second pawl device for rotating the same ratchet wheel in the reverse direction, means continuously connecting the last mentioned pawl device with the lever for quick speed and by which it is reciprocated with every oscillation of the lever, and means for maintaining said two pawl devices alternately out of contact with the ratchet wheel during different periods of oscillation of the hand lever.

15. In a set works for sawmills, the set shaft, a pivoted lever, means operated by the lever for rotating the shaft forward, means also operated by the lever for rotating the shaft backward, controlling cam devices for determining which of said two means shall be put into operation at any moment, a lever for operating the cam devices, a handle A^{14} journaled on the end of the pivoted lever and having a rocker arm A^{11} , a rod A^{10} connected with the arm A^{11} , and a stop latch A^9 for operating the lever for operating the controlling cam devices.

16. In a set works for sawmills, the set shaft, a pivoted hand lever on said shaft, means operated by the hand lever for rotating the set shaft forward, a frame pivoted to the set shaft, means operated by the frame for rotating the set shaft backward, a lever for operating the frame, connections between the lever and hand lever whereby the frame travels through a greater arc than the hand lever, and devices for throwing one of the means into operation and the other out or vice versa, whereby the set shaft may be rotated forward at a slow speed and backward at a fast speed.

In testimony of which invention, I have hereunto set my hand.

HERBERT M. LOFTON.

Witnesses:

E. A. DORR,
T. T. SMITH, Jr.