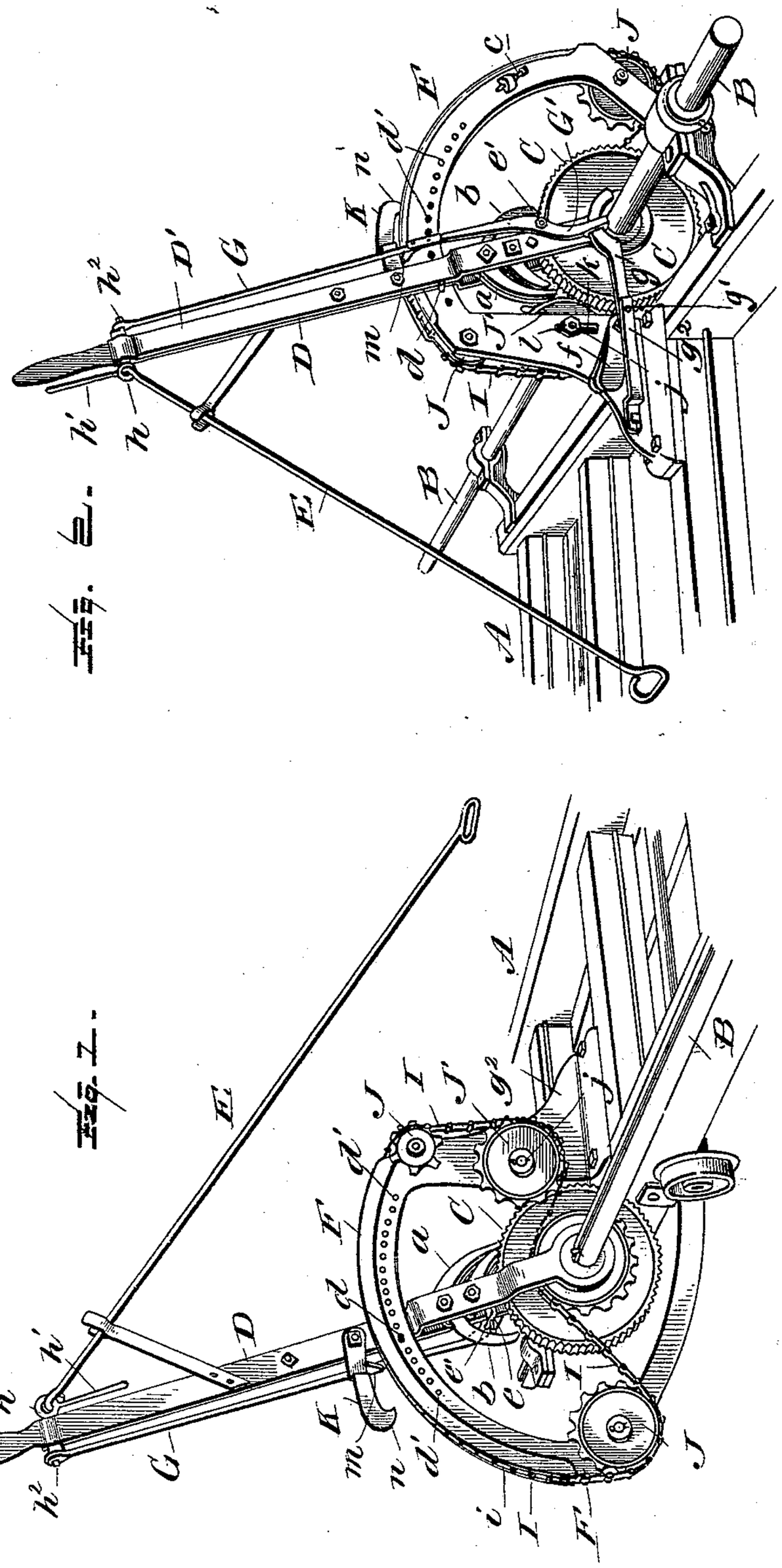
(No Model.) 2 Sheets—Sheet 1.

H. W. EISENHART, S. S. MORTON & H. B. WALTMAN.

SAWMILL SET WORKS.

No. 495,405. Patented Apr. 11, 1893.



Witnesses
L. C. Hills
Ewell A. Dick

Inventors:
H. W. Eisenhart
S. S. Morton
H. B. Waltman
by Mitchell Bailey Attorney

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Fig. 4.

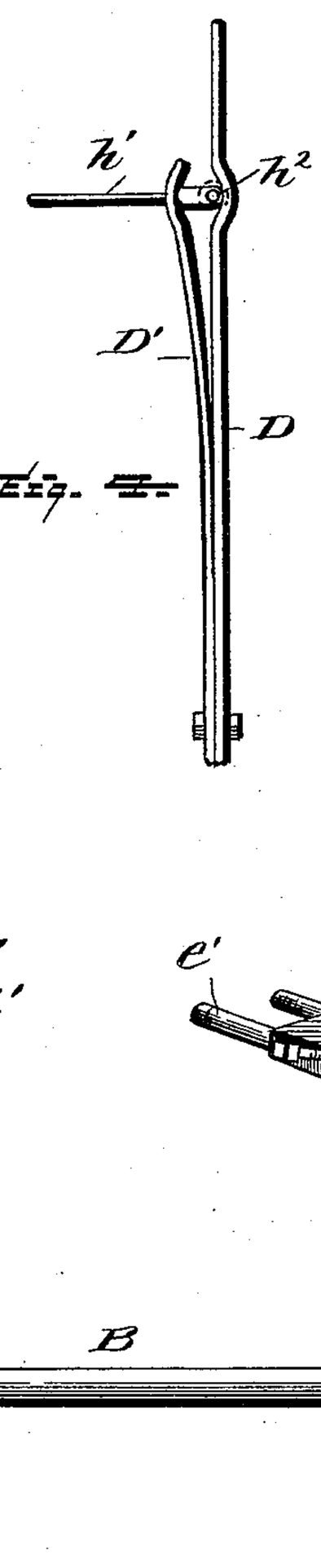


Fig. 5.

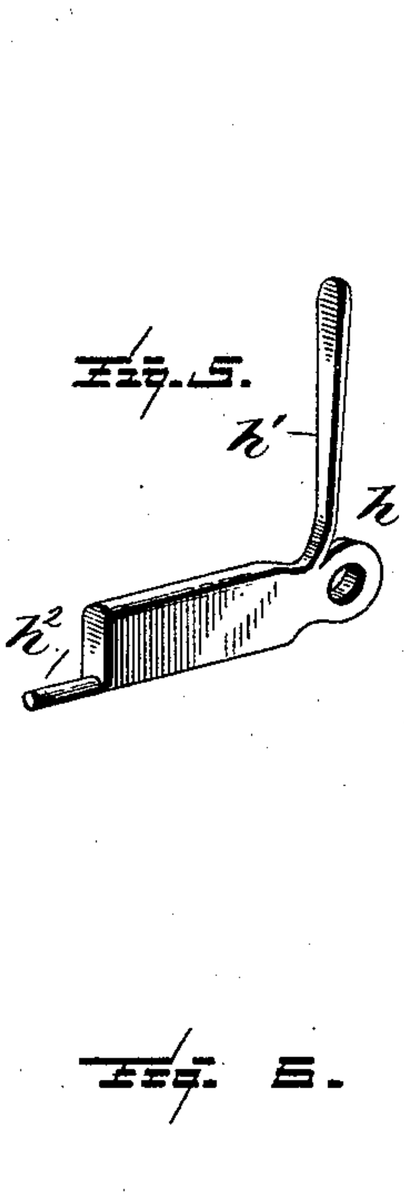
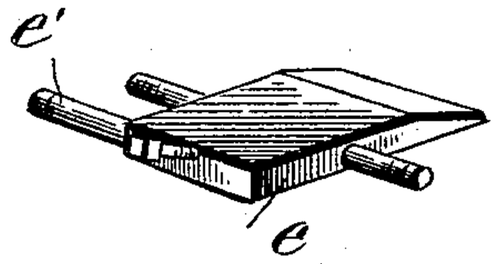


Fig. 1.

Fig. 6.



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H. W. Eisenhart
S. S. Morton
H. B. Waltman
by Marcellus Bailey Attorney

UNITED STATES PATENT OFFICE.

HENRY W. EISENHART, SAMUEL S. MORTON, AND HENRY B. WALTMAN, OF YORK, PENNSYLVANIA, ASSIGNORS TO A. B. FARQUHAR, OF SAME PLACE.

SAWMILL-SETWORKS.

SPECIFICATION forming part of Letters Patent No. 495,405, dated April 11, 1893.

Application filed December 10, 1892. Serial No. 454,765. (No model.)

To all whom it may concern:

Be it known that we, HENRY W. EISENHART, SAMUEL S. MORTON, and HENRY B. WALTMAN, of York, in the State of Pennsylvania, have invented certain new and useful Improvements in Sawmill-Setworks, of which the following is a specification.

Our improvements in set-works for the head blocks of saw mill carriages have reference to means for obtaining a quick back motion of the knees; to employing for this purpose the same lever by which the knees are advanced; and to providing means whereby the feed movement of the knees can be adjusted with the utmost nicety and precision, and at the same time with greater ease and facility than has heretofore been practicable.

The improvements can best be understood by reference to the accompanying drawings, which illustrate a mechanism embodying our invention in its preferred form.

We will first describe the mechanism represented in the drawings and will then point out specifically in the claims those features of the same which we believe to be new and of our own invention.

In the drawings—Figure 1 is a perspective view of the mechanism with the parts in position for the forward feed. Fig. 2 is a perspective view of the mechanism from the side opposite that seen in Fig. 1, with the parts in position for back motion. Fig. 3 is a rear elevation partly in section. Fig. 4 is an edge elevation of the split operating lever, with the flattened swivel bolt turned to spread the leaves of the lever apart. Fig. 5 is an enlarged perspective view of the flattened swivel bolt. Fig. 6 is a like view of the pawl lifter.

A is a portion of the saw mill carriage.

B is the set shaft.

C is the ratchet-wheel fast on the set shaft.

D is the operating lever, provided with two sets of pawls *a*, *b*, to engage the ratchet wheel—the one *a* to advance and the other *b* to draw back the knees, either set being thrown into engagement with the ratchet by mechanism carried by the lever according to the direction in which it is desired to move the knees, and E is the sawyer's rod, jointed to the upper end of the operating lever, and extending across the carriage to that side of it on which the sawyer usually stands. These elements have before been assembled and combined in the same general way in set works for saw mill carriage head blocks and are not of our invention.

To provide for an accurate and ready adjustment of the forward feed of the knees we proceed as follows: The operating lever plays between a set screw *c* in rear, and a stop pin *d* in front—the set screw being mounted on a bracketed quadrant F secured to the carriage and the pin being set in one of a series of holes *d'* formed on the quadrant. The stroke of the lever will of course vary according as the pin is set nearer to or farther from the set screw. The holes *d'* are formed at definite and ascertained distances apart. In this instance they are at such distance apart that the movement of the lever through that distance will suffice to advance the knees one-eighth of an inch. The distance between the set screw and the first hole is equal to the width of the lever, and the thickness of the saw, plus that distance required to effect a feed of an eighth of an inch, and the set screw is provided so that it may be adjusted to compensate for variations in the thickness of the saws which may from time to time be used in the machine. By setting the pin in the fourth hole (counting from the end nearest the set screw) the knees will be advanced one-half inch at each stroke of the lever; by setting it in the seventh hole the knees will be advanced seven-eighths of an inch at each stroke, and so on. In this way the sawyer is entirely independent of the scale and pointer usually employed, the one on the knee and the other on the base on which the knee slides. The adjustment is most readily and easily obtained simply by counting the holes from the set screw end until the proper one is reached, and then setting the pin in that hole. After that the sawyer need have no further care; all that is required is to give a stroke to the lever, and the knees will be advanced accurately the requisite distance. The holes are virtually a scale on the quadrant; and when the stop is once adjusted a single stroke of the lever will invariably effect the feed of the knees required for the next cut.

The feed pawls *a* hung in the operating lever are several in number and are so arranged that one or more of them will catch in the ratchet wheel on the slightest movement of the lever—thus avoiding lost motion when the feed takes place. We make use of but one backing pawl *b* to engage the ratchet wheel, this pawl being also hung in the operating lever. These two sets of pawls are mounted in the forked part of the lever which straddles the ratchet wheel, and they are controlled by a lifter *e* also pivoted in that part of the lever and so arranged that when moved in a direction to raise the feed pawls out of engagement with the ratchet wheel, it will allow the backing pawl to drop into engagement with the ratchet wheel and vice versa. The latch or stop pawls for preventing back motion, are shown at *f* pivoted to the bracketed quadrant and controlled by a lever *g* pivoted at *g'* to a lateral stand g^2 on the bracketed quadrant and provided on its shorter arm with a cross bar which extends under the tails of the stop or latch pawls. To operate the pawl controlling mechanism we employ the rotating or swivel eye-bolt *h* mounted in a bearing in the upper end of the operating lever D, having its front end connected as usual to the sawyer's rod E, and provided on its rear end with a crank h^2 to which is jointed the rod G, which extends down along the operating lever. This rod is jointed at *e'* to the lifter *e* and is provided with a downward extension G' which hooks under the curved end of the longer arm of the latch pawl lever. By depressing the rod G the lifter will be operated to lift the feed pawls and allow the backing pawl to drop, and the longer arm of the latch pawl lever will be permitted to drop, thus causing the cross pin or bar on the shorter arm to rise and lift the tails of the latch pawls to such an extent as to disengage the points of the pawls from the ratchet wheel. When on the other hand the rod G is raised and returned to normal position the feed and latch pawls will engage the ratchet, and the backing pawl will be disengaged therefrom. These movements of the rod G can be accomplished, either by the sawyer's rod E, or by a small handle *h'* on the eye bolt *h* itself. The operating lever at the point where the eye bolt has its bearing in it is split so as to furnish a spring leaf D', and the eye bolt is flattened on two opposite sides where it passes through the lever. The flattened sides bear such relation to the crank h^2 that they will be in contact with the parts D', D, when the crank is in the position it assumes when either the feed or the backing pawls are engaging the ratchet wheel, and in this way the rod G and the parts controlled by it will be held firmly, and by what may be termed a spring detent or lock, in either one of the two positions.

We come now to the remaining feature of our improvements, which is found in the mechanism for imparting quick back motion to the knees.

Fast upon the set shaft B is a sprocket wheel H which is engaged by an endless sprocket chain I which passes over the upper portion of the same and thence up around similar guide wheels J, J', mounted to revolve on the bracketed quadrant F, and over the top of the quadrant, at which point it extends through a guide recess or trough *i* with which the top of the quadrant is formed or provided. The wheels J can act not only to guide but also to tighten the chain, to which end one of them, J' in the present instance, has the pivot or axle *j* on which it turns, mounted in a slot *k* in the quadrant, a set nut *l* being provided to hold it in adjusted position.

Upon the operating lever D is pivoted a hook pawl K, in such position as to overhang the open trough *i* in the top of the quadrant through which the sprocket chain passes, said pawl being controlled by a lifting lug or projection *m* on the rod G in such manner that it is lifted and lowered in unison with the backing pawl, so that it will drop only when the feed pawls are lifted out of engagement with the ratchet wheel. When it does drop it engages one of the links of the sprocket chain, and its form is such that it will catch and pull on this link only when the operating lever moves forward; when the lever is swung back, then the pawl by reason of the bevel *n* on its under edge will ride over the links. Thus the sprocket chain pawl K being at a greater distance from the center of motion of the operating lever than are either the feed pawls *a* or the backing pawl *b*, and the sprocket wheel H itself being considerably less in diameter than the ratchet wheel C, much more extended movement of rotation can be imparted to the set shaft through these instrumentalities, than through either the feed pawls or the backing pawl for the same length of stroke of the operating lever D. This movement we avail of for backing the knees, the forward pull of the hook pawl on the sprocket chain, causing, as will be seen by inspection of the drawings, the sprocket wheel H to revolve in the needed direction for this purpose. We might depend upon these means alone for backing the knees, and dispense with the backing pawl *b*. But we prefer to retain the latter because under the arrangement represented back motion can be obtained upon both the forward and the back stroke of the lever, the knees in this way being gigged back more rapidly than they otherwise would be. When the feed pawls are lifted, both the pawls *b* and K drop, the one into engagement with the ratchet wheel, the other into engagement with the sprocket chain. On the forward stroke of the lever the hook pawl pulls on the chain, and thus revolves the sprocket wheel H, while the other pawl *b* rides over the teeth of the ratchet wheel. On the back stroke of the lever the reverse action takes place; the hook pawl rides over the chain, while the backing pawl takes hold of and rotates the ratchet wheel.

This we believe to be quite new. We know of no lever set-works having two sets of backing devices of any description, acting alternately in the same direction upon the set shaft, the one on the forward and the other on the back stroke of one and the same operating lever.

Having described our improvements and the best way now known to us of carrying the same into effect, what we claim herein as new and of our own invention is—

1. A "gig-back" or back motion mechanism for the head blocks of saw mill carriages, comprising a sprocket wheel fast upon the "set" shaft, an endless sprocket chain supported by suitable guides and engaging said sprocket chain, a pawl to engage the chain, a pivoted operating lever carrying said pawl, and means for bringing the pawl into and out of engagement with the chain.

2. The combination with the set shaft and the forward feed mechanism, of a back motion mechanism, whereby the set shaft is revolved in a direction opposite to that in which it is moved by the forward feed mechanism, a single operating lever connected to and adapted to operate said mechanisms during its movement in one and the same direction, and means whereby the one mechanism is thrown out of engagement when the other is thrown into engagement with said lever, substantially as and for the purposes hereinbefore set forth.

3. The combination with the set shaft and a single operating lever, of two distinct sets of back motion devices acting alternately in the same direction on the set shaft, the one during the forward and the other during the back stroke of the operating lever, substantially as hereinbefore set forth.

4. The combination with the set shaft, and the usual ratchet wheel, backing and forward feed pawls, lifter therefor and operating lever, for effecting the back and forth movements of the knees, of an auxiliary backing mechanism and a separate pawl therefor which is mounted on the said operating lever, is lifted and lowered into and out of operative connection with said auxiliary backing mechanism in unison with the backing pawl for the ratchet wheel, and engages said auxiliary mechanism only when the operating lever moves in the direction in which the other backing pawl rides over the ratchet wheel, substantially as hereinbefore set forth.

5. In saw mill set works the combination of the operating lever having a laterally expansible and spring closing bearing, the cranked rotatable eye bolt having a flattened portion which passes through and is seated in said bearing, the pawl operating rod connected to said eye bolt, and the backing and feed pawls carried by the lever, and controlled by the pawl operating rod, the set shaft and mechanism engaged by the pawls, substantially as and for the purposes hereinbefore set forth.

6. The combination substantially as hereinbefore set forth of the set shaft, the ratchet wheel, the operating lever, the backing and feed pawls for engaging said ratchet wheel, the mechanism for controlling said pawls, the sprocket wheel fast on said set shaft, the endless sprocket chain engaging said sprocket wheel and passing around suitable guides, the additional pawl on the operating lever for engaging said sprocket chain, and means whereby said pawl is lifted and lowered in unison with the backing pawl for the ratchet wheel.

7. In combination with the set shaft, the sprocket wheel and the sprocket chain, the bracketed quadrant having a guide groove or channel on top for the passage of the sprocket chain, guide wheels on said quadrant for said sprocket chain; the operating lever, and the sprocket chain pawl mounted on the lever, and overhanging the channel in the top of the quadrant, substantially as hereinbefore set forth.

8. The bracketed quadrant having the top channel for the support and guidance of the sprocket chain, and provided with the series of holes d', the pin d and the set screw c, in combination with the operating lever the sprocket chain, the set shaft and the forward-feed and back-motion devices for said shaft, substantially as and for the purposes hereinbefore set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

HENRY W. EISENHART.
SAMUEL S. MORTON.
HENRY B. WALTMAN.

Witnesses:
BENJAMIN H. FARQUHAR,
J. HERMAN STALLMAN.