A. S. RICHARDS.

Saw-Mill Head-Block.

No. 201,199. Patented March 12, 1878.

Fig. 1.

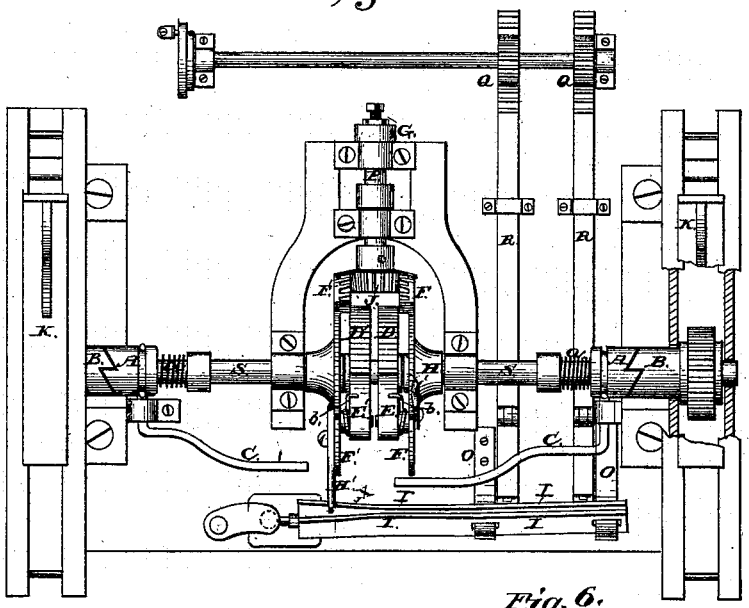


Fig. 6.

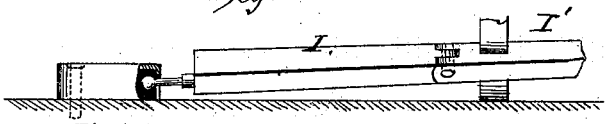


Fig. 2.

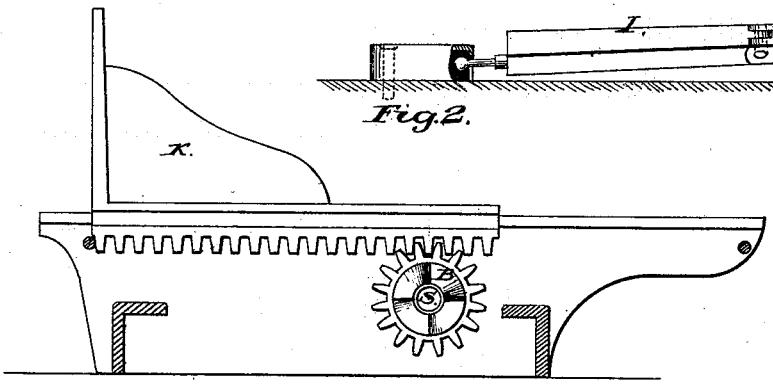


Fig. 3.

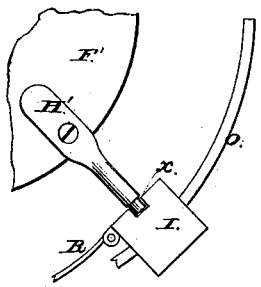


Fig. 4.

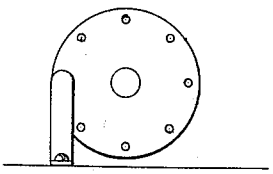
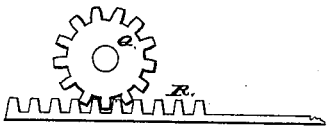


Fig. 5.



Attest:

Edwin A Burlingame

Peter L. Burlingame

Inventor:

Alfred S. Richards

UNITED STATES PATENT OFFICE.

ALFRED S. RICHARDS, OF GRAND RAPIDS, MICHIGAN.

IMPROVEMENT IN SAW-MILL HEAD-BLOCKS.

Specification forming part of Letters Patent No. **201,199**, dated March 12, 1878; application filed November 1, 1877.

To all whom it may concern:

Be it known that I, ALFRED S. RICHARDS, of the city of Grand Rapids, county of Kent, and State of Michigan, have invented a new and useful Improvement in Set-Works for Saw-Mills, of which the following is a full specification, reference being had to the accompanying drawings, in which—

Figure 1 is a top or plan view of my improved machine; Fig. 2, a transverse section of the same. Figs. 3, 4, and 5 are detail views.

My invention relates to the construction of a set-work for saw-mills which may be worked either by hand or by means of an incline so arranged that the knees may be moved upon the head-blocks independently of the setting-shaft and of each other, and so that one knee may be set in advance of the other any required distance, and then moved simultaneously; and that the log can be set forward with one movement of a lever, either forward or backward, or both forward and backward.

In the drawing, in each of the figures, like letters represent like parts.

B B are loose pinions geared to knees K upon head-block, for the purpose of moving knees K forward to set the log, which pinions B B are notched to fit notches in clutches A A. A A are clutches revolving with shaft S, but so arranged, by means of feather-keys or similar device, as to slide longitudinally upon shaft S when being thrown in and out of gear, as they may be, by means of trips C C. C C are trips for throwing clutches A A out of gear with pinions B B, when it is desired to move knees K K either backward or forward (as they may be moved) independently of the set-works or of each other. *a a* are spiral springs surrounding shaft S, for the purpose of throwing clutches A A in gear with pinions B B. D D′ are ratchet-wheels solid on shaft S, and which, when revolved, will also revolve shaft S. E E′ are pawls for revolving ratchets D D′—E for revolving ratchet D, and E′ for revolving ratchet D′. F F′ are bevel-gears attached to pawls E E′, and working them upon ratchets D D′ in such a manner that ratchets D D′ are made to revolve forward no matter which way the bevel-gears F F′ are worked. J is a pinion geared between bevel-gears F F′, so as to transfer the power and reverse it from one bevel-gear to the other, and consequently from one pawl to the other, and thus from one ratchet to the other, so that no matter which way the bevel-gears are worked, the power being thus transferred, the ratchets D D′ and shaft S must all the time have a forward revolution, and consequently knee K must continually move forward when clutches A A are in gear with pinions B B. H H′ are levers to operate the set-works, and are attached, lever H to bevel-gear F, and lever H′ to bevel-gear F′. Lever H is used when it desired to set by hand, and lever H′ is operated by double incline I when it is desired to set automatically. I I is a double incline, differing from the ordinary incline used for setting purposes in this, that the single incline is formed in one piece, and would only set as the lever H′ moved in one direction, while my double incline is formed in two pieces, I I, Fig. 1, with space *x* between to guide lever H′, and will, in connection with my setting apparatus, set either way the lever H′ may be moved, whether up or down the incline; but Fig. 3 more accurately represents my double incline, which, instead of consisting of two inclines, I I, and a space between them, as shown in Fig. 1, consists of a single piece, I, with groove X for guiding lever H′, as seen in Fig. 3.

Fig. 6 represents a modification of my grooved incline, and which is made in two sections, I I′, hinged or pivoted together, whereby a proper entrance can always be obtained for the ready insertion of lever H′ in the groove of the incline, said hinged section I also forming a support for the horizontal section I′ of the incline.

When, for any reason, more power is required for setting than can be obtained by use of levers H or H′, acting upon bevel-gears F F′, as above described, an adjustable lever or similar device, or a ratchet and pawl, may be used upon shaft P, which, being worked to right and left, or to right or left, will, through pinion J, acting upon bevel-gears F F′, move the setting-works with great power.

The operation of the above-described invention is as follows: Suppose a log to have been finished, it is now desired to recede knees K K. This is done by placing the foot on trips C C, which throws clutches A A out of gear,

when knees K are free to be moved. The log is placed upon the head-blocks in front of knees K K. If it is desired to move one knee K in advance of the other, to divide the taper of the log, this may be done by setting the foot upon one of trips C, and advancing the other knee by means of setting-works, or the one out of gear by hand. The log being in place, it may be set to saw any thickness, from the one-sixty-fourth of one inch up to and including four inches, by one movement of lever H or H′. If lever H be moved forward, it carries with it bevel-gear F and pawl E, thereby revolving ratchet D, and setting the log at the same time by means of pinion J. The motion is reversed upon bevel-gear F′, which moves backward, carrying with it pawl E′.

If lever H be moved backward, bevel-gear F is moved backward, and carries with it pawl E. At the same time the motion is reversed, as before, and bevel-gear F′ is moved forward, carrying pawl E′, which revolves ratchet D′ and sets the log, as before. If lever H′ be used, (by means of double incline I,) the same results are obtained, the processes being reversed.

With the above-described combination, the following results are obtained: Uniform thickness of lumber at one down or up stroke of the lever from one-sixty-fourth of an inch to and including four inches. Both ends of the log will be advanced the same distance. The pawls will not slip, nor will more than two be required, and thereby a saving of over one-half the time required by any other process will be accomplished.

By means of my double incline, these set-works may be made self-setting, and by the movement of lever H′ up in the groove of the double incline one-half of the required set is made, and by the return of the lever the set is completed, thereby accomplishing the required set with but one-half the angle necessary to set by the ordinary single incline.

By the use of the loose pinions and clutches, a log of greater diameter at one end than the other can be sawed with greater economy of lumber by shifting the clutch out of the pinion under the knee, against which the larger end of the log rests, and by a movement of lever H advancing the smaller end in such a manner as to divide the difference between the diameters of the ends of the log, and give an equal amount of taper to each slab, thus avoiding, to the greatest extent practicable, sawing the log across the grain.

In the same manner lumber may be sawed to almost any reasonable taper.

I claim as my invention and desire patented—

1. The combination, with the head-blocks, of the knees K, having racks in their under sides, loose pinions B, and clutches A A, arranged on shaft S, whereby the knees are adapted to be moved by hand or automatically, substantially as specified.

2. The combination, with the head-blocks, of the knees K, having racks in their under sides, pinions B B, shaft S, having clutches A A, bevel-gears E E′, pinion J, ratchets and pawls D D′ F F′, and levers H H′, the several parts constructed and relatively arranged to operate substantially as herein shown and described.

3. The combination, with the set-work mechanism, of the lever H′ and movable grooved incline I, substantially as and for the purpose herein shown and described.

ALFRED S. RICHARDS.

Witnesses:
EDWIN A. BURLINGAME,
PETER L. BURLINGAME.