

E. H. STEARNS.  
Head-Blocks for Saw-Mills  
No. 199,667. Patented Jan. 29, 1878.

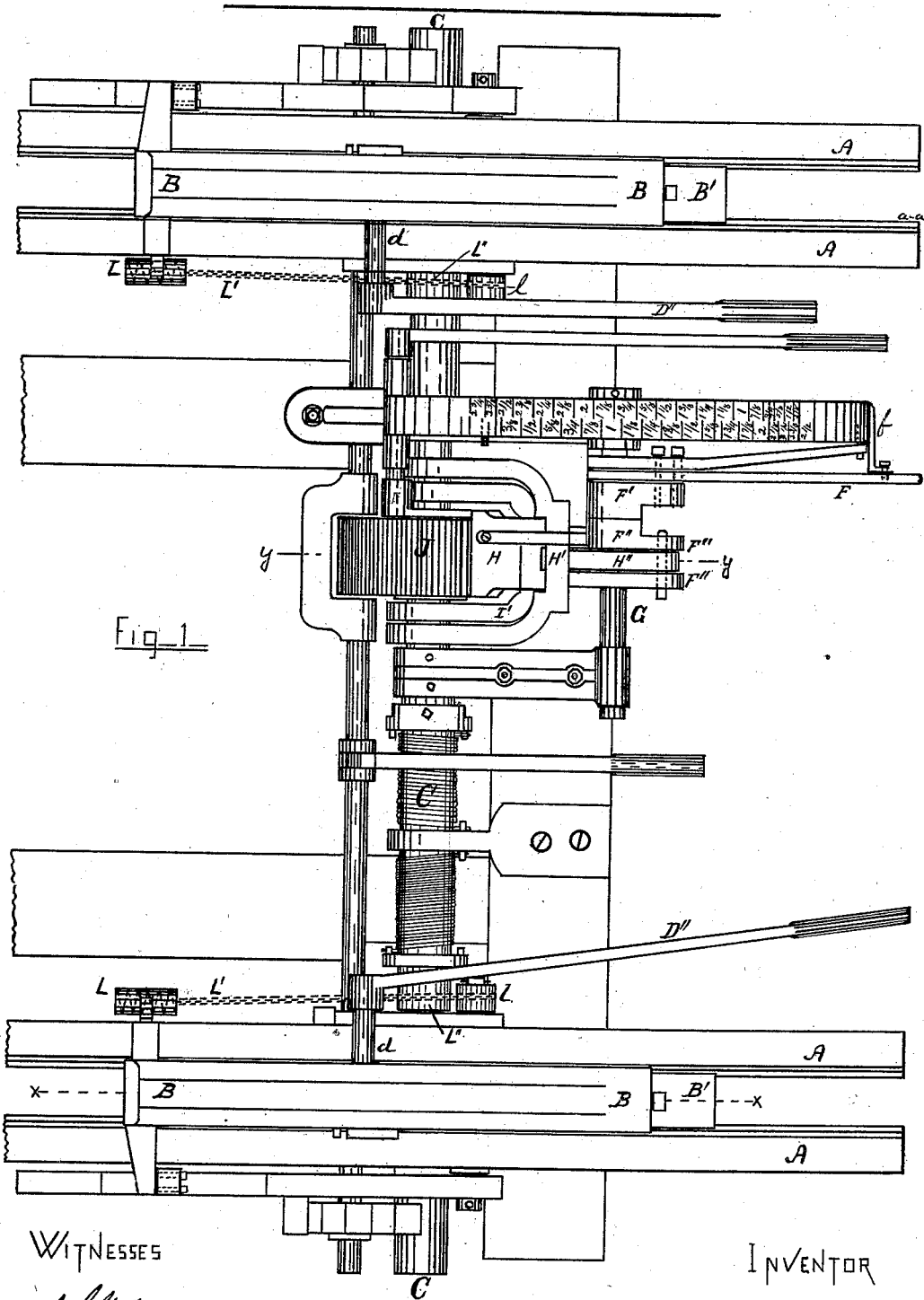


Fig. 1

WITNESSES

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Fig. 2

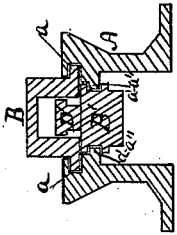
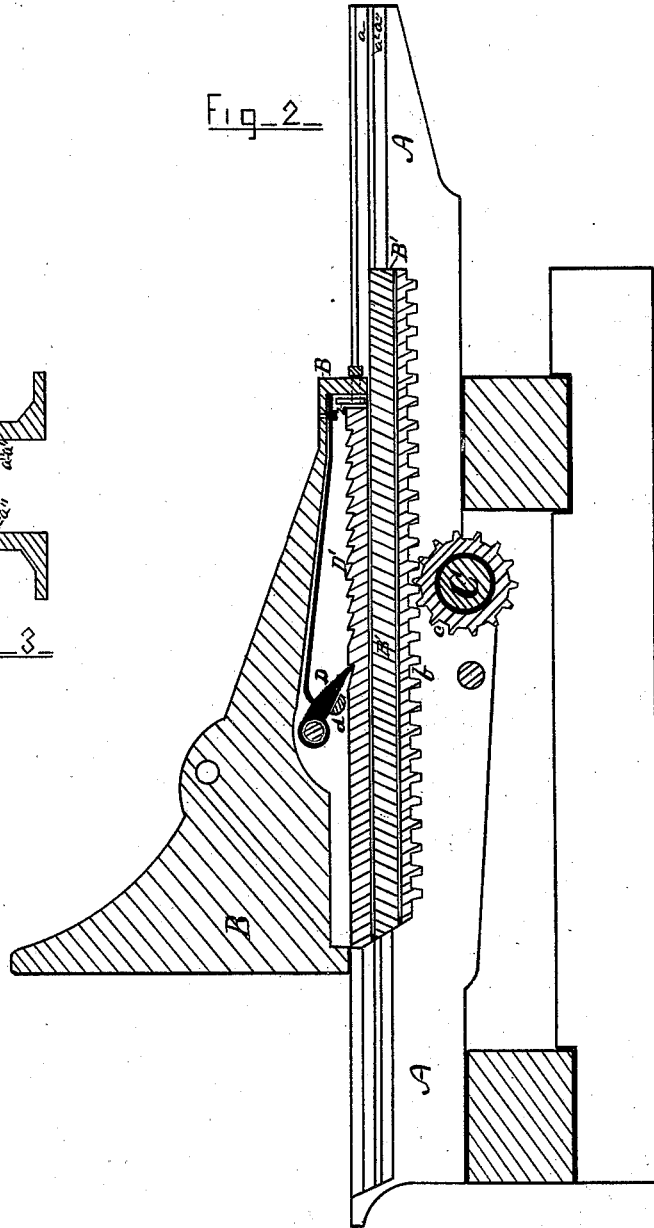


Fig. 3

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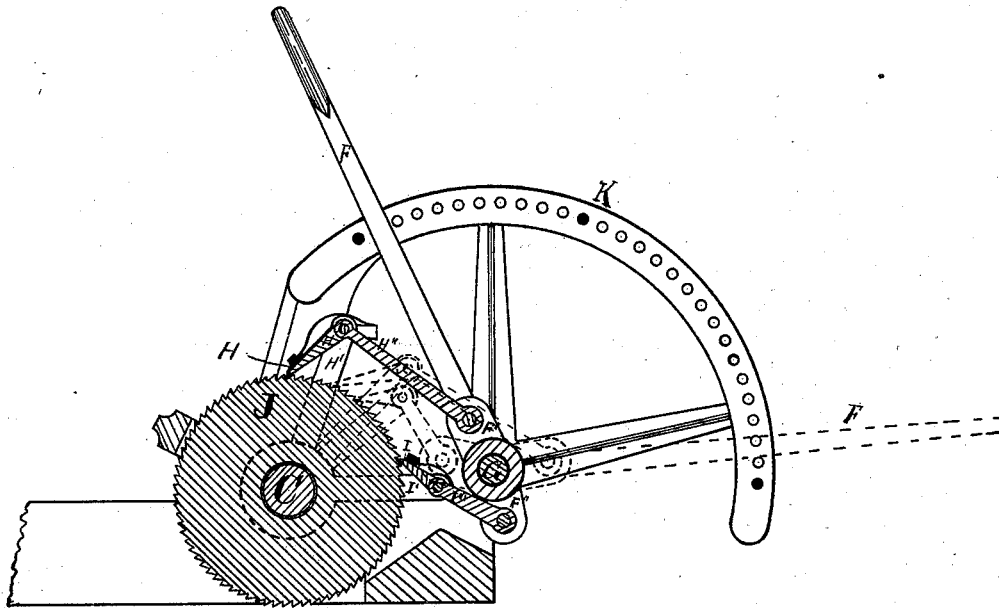


Fig 4

WITNESSES

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# UNITED STATES PATENT OFFICE.

EDWARD H. STEARNS, OF ERIE, PENNSYLVANIA.

## IMPROVEMENT IN HEAD-BLOCKS FOR SAW-MILLS.

Specification forming part of Letters Patent No. **199,667**, dated January 29, 1878; application filed May 17, 1877.

*To all whom it may concern:*

Be it known that I, EDWARD H. STEARNS, of Erie, in the county of Erie and State of Pennsylvania, have invented a new and useful Improvement in Saw-Mill Head-Blocks; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to the construction of head-blocks for saw-mills.

It consists, first, in improvements in the setting mechanism; second, in improvements in the knees and their operation.

My device is shown in the accompanying drawings, as follows:

Figure 1 is a plan view of a set of head-blocks which contain my improvements. Fig. 2 is a longitudinal section of one of the knees and surrounding parts, taken on line *xx*, Fig. 1. Fig. 3 is a transverse section of the same parts, taken on line *xx*, Fig. 2. Fig. 4 is a transverse section of the setting mechanism, taken on the line *yy*, Fig. 1.

The letters of reference indicate parts as follows:

A A are the bed plates or beams, on which the log rests as it is fed to the saw. B B are the knees. B' B' are slides, which operate within the bed-plates, and to which the knees are detachably connected, and by which they are moved. C C is the actuating-shaft. J is the ratchet-wheel by which the shaft is actuated. F is the setting-lever. G is the shaft which serves as a fulcrum or journal for the setting-lever. F' is the collar by which the lever F is attached to the shaft G. F'' is a collar on the shaft G, which serves as a crank for the actuating-pawls H and I. H' and I' are yokes, which carry the pawls; and H'' and I'' are links or bars connecting these yokes with the crank F''. K is an arched index, for indicating and gaging the setting.

Other letters which may be used to indicate other parts will fully appear in the following general description.

First, the setting mechanism: J is the ratchet-wheel by which the actuating-shaft is propelled. This wheel is actuated by the action upon its surface of two pawls, H and I. As far as the action of these pawls upon the ratchet is concerned, there is nothing new. The pawls are so arranged and operated that

the actuating-lever operates the ratchet when moving in either direction—that is to say, the pawl H moves the wheel when the lever is moved toward the log, and pawl I when the lever is moved from the log. Thus any movement of the lever produces a movement of the ratchet J.

I am aware that devices have been made which produce this same result, as, for example, in the patent to Staley, Reissue No. 6,808, December 14, 1875; but I accomplish the result by other means and in a much more perfect manner.

The pawls may be of such a relative length as to divide the width of the ratchet-notches for the purpose of making accurate and minute settings, as is now commonly practiced, and as was fully described by me in my patent of April 15, 1856, and its reissue.

The manner in which I construct this part of my invention is as follows: Journaled onto the shaft C by the side of the ratchet-wheel, and consequently concentric with the same, are two yokes, H' and I'. Pivoted to the bow of these yokes are the pawls H and I, in such a manner that they always rest upon the wheel at the same angle, no matter at what point the yoke is placed. Thus the pawls always have a firm hold on the teeth of the ratchet. These yokes receive their motion by being connected with the crank-collar F'' on the oscillating shaft G by connecting-bars H'' and I''. The position of these parts is fully shown in Fig. 4, the dotted lines showing a change of position of parts.

By placing the pawls on oscillating collars, and then connecting these to the actuating-crank, in place of connecting the pawls directly to the crank or lever, as is done by others, I am enabled to have the said pawls as firmly set to the teeth of the ratchet when the lever is at one point in its arc as in another, while by the old method the lever could only move through a small arc, and have the pawls retain connection with the ratchet-teeth. Therefore, by my arrangement of parts, the action of the lever may be through as wide an arc as dispatch in setting the log requires.

The crank-collar F'' has two wrist-pins, one on each side of the shaft, to one of which the

bar H'' connects, and the rod I'' to the other. In constructing the crank-collar F'', I put the wrist-pins out of line with the center of the shaft, (to more or less extent,) as will be seen in Fig. 4. The object of this is to enable the connecting-rods and yokes to be worked approximately to a dead-center—that is, so as to come into nearly a straight line, and not require the actuating-lever to move through too wide an arc for convenient operation.

The shaft G may be of any length desired, and the lever may be attached at one end, and the crank-collar at any desired distance therefrom. This will permit of the actuating-levers being at one end of the carriage and the ratchet-wheel in the middle of the shaft, which is desirable on account of the torsion of the shaft.

The ratchet-wheel may be operated, if desired, by only one pawl, yoke, and connecting-bar, in which case a friction-brake or catch-dog should be used at some other point on the ratchet-wheel; and also, if so constructed, the lever would only operate the ratchet while moving in one direction.

To indicate the distance traversed by the knees as the lever is moved, I place by it an arched index. On the face of this index I have two rows of figures, which read in opposite directions. The object of the two rows of figures is to read the result of its action when moving in either direction. The lever F' is provided with a finger, *f*, which acts as a pointer on the face of the arched index. The arch K may be provided with holes, in which pins may be inserted to stop the action of the lever at any point, which is of special convenience when the whole log is to be sawed into lumber of like thickness.

Second, the construction and operation of the knees: This part of my invention relates to the construction and operation of that class of head-blocks in which the knees may be thrown out of gear with the mechanism by which they are propelled; and it consists in the means which I have provided for thus throwing the knee out of gear, and also in construction and operation of the various parts.

This part of my invention is shown best in Figs. 2 and 3, of which Fig. 2 is a longitudinal section, and Fig. 3 is a transverse section, of the knee and the bed-piece on which the knee rests and operates.

The bed-piece A is made of two walls, on the inner sides of which are the grooves *a* and *a* and the tongues *a' a'* and *a'' a''*. The knee is provided with lateral projecting tongues, which fit into the grooves *a a*, and there the said knee has its bearing, and there it slides back and forth. The knee B is also provided with a cavity on its lower side between the lateral projecting tongues. Between the walls of the bed-piece, and upon the tongues *a' a'* and *a'' a''*, slides or operates a slide-block, B'. On the upper side of this slide-block is attached a ratchet-bar, D', and on the lower

side is a rack-bar, *b*, which gears in the pinion *c* on the actuating-shaft C. By this rack-and-pinion arrangement the slide-block is moved at pleasure on the tongues *a' a'* and *a'' a''*. The slide-block does not come in contact with the knee; but the ratchet-bar, which is attached to it, lies within the cavity in the knee. Within this cavity and above the ratchet-bar, and attached to the knee, is a pawl, D, which can be raised or lowered at pleasure by moving the lever D'', which operates a cam, *d*, which operates upon the pawl. This pawl, when down, engages the teeth of the ratchet-bar D', and when thus engaged the knee B is made to move with the slide-block B'.

The position of the pawl, as shown in the accompanying drawing in Fig. 4, is at what I call the "initial point," for it is there that it rests when all the knees are pulled back to receive a new log, and it remains at that point unless it is found necessary to put the knees out of line for the purpose of receiving a tapering log, or it is desired to saw tapering stuff. When such a change from the initial point or from the initial line is desired, the pawl of such knees as it is desired to withdraw or have left behind the initial line is raised, and those knees will not advance when the feeding forward is done. The slide beneath those disengaged knees, however, moves, and when the knee is again put in communication with it the pawl D enters some notch back of the initial notch. By this simple arrangement I can bring the log at an angle to the saw-line, or I can set the knees to conform to a tapering or irregular shaped log without the use of independent knees, or knees with special mechanism for making them act independently.

In place of the pawl D and ratchet D' any suitable clutching device may be used for establishing or cutting off connection between the knee and the slide.

In Fig. 2 it will be observed that when the slide B' moves back, the end of the ratchet-bar D' will come in contact with the end of the cavity in the knee, and, no matter what notch the pawl may be in, it will traverse to the position shown—the initial position—and the knee will be carried back. At the point where the end of the ratchet-bar D' comes in contact with the end of the cavity marked Z, I place a buffer of some kind to receive and take up the shock or concussion.

On one side of the knee, near its standard, is a socket, L, in which is attached a chain, L', which passes over a pulley or roller, *l*, and finally winds around a drum, L'', which is on the main shaft C. This drum L'' has the same radius as the pitch-line of the pinion *c*, which operates the knee. When the knee is drawn back the chain is wound onto the drum, and as it advances it is unwound.

In the socket L is arranged a spring (see dotted line) or some elastic substance, by which the chain is kept rigidly taut at all times; or,

in place of this device, an elastic cord may be used. The purpose of this device or its equivalent is to take up any slack or play which may occur in the rack and pinion, so that when the knee is set forward there will be no back slack.

In head-blocks heretofore made by me I have used chains in a similar position, but for the purpose mainly of returning the knee from an advanced position. (See my patent of September 1, 1868, and Reissue No. 4,625.) In that case the chains did not wind onto the setting-shaft, but onto a reacting-shaft. The knees in that case were pushed forward by a ratchet-movement, and the chains incidentally served to hold the knee back against the ratchet work, and thus prevented any play movement.

In the present case I use the chains to perform expressly what in that case they did incidentally. As the knees in this case are pushed forward by a rack-and-pinion movement, there is greater liability, through inaccuracy of construction and wear of parts, of play. This must be provided against, and I do it by the use of the chains named and the elastic connection or some equivalent, as, for example, an elastic rope.

For the reasons above stated, I shall not, in this patent, claim, broadly, the use of chains, &c., at that point for taking up play in the working mechanism of the knee; but I shall claim them when in the combination I here show.

What I claim as my invention is—

1. The combination, within a saw-mill head-

block setting device, of the ratchet-wheel J and pawls H and I, which pawls oscillate toward and from each other alternately, and are pivoted to carriers which are concentric with each other and with said ratchet-wheel J, as and for the purposes set forth.

2. The combination, within the setting mechanism of a saw-mill head-block, of a ratchet-wheel, J, which is operated upon by a pawl, which pawl is pivoted on a yoke or carrier which is concentric with said ratchet-wheel J, and which carrier is operated by being connected by a bar with the actuating-lever or a crank upon a shaft extending from said lever, substantially as set forth.

3. The combination of the shaft C, pinion c, rack b, and slide B' with the knee B, said knee being moved only when in communication with said slide by a proper attaching and detaching device, substantially as and for the purposes mentioned.

4. In combination with the chains L', the knee B and shaft C, said chains being attached at one end to the said knee and at the other end to the said shaft C, for the purposes mentioned.

In testimony whereof I, the said EDWARD H. STEARNS, have hereunto set my hand.

EDWARD H. STEARNS.

Witnesses:

JNO. K. HALLOCK,  
JNO. D. MCFARLAND.