2 Sheets-Sheet 1.

E. H. Stearns,

Sarr-Mill Head-Block.

No. 14,700. Patented Apr. 15, 1856.

Fig B

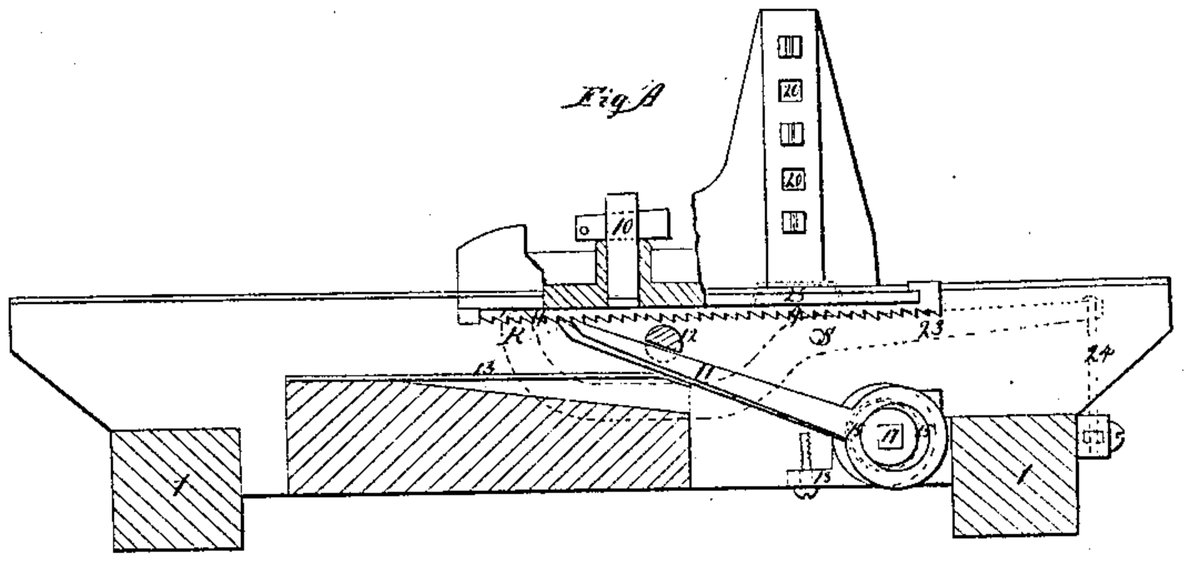


Fig B

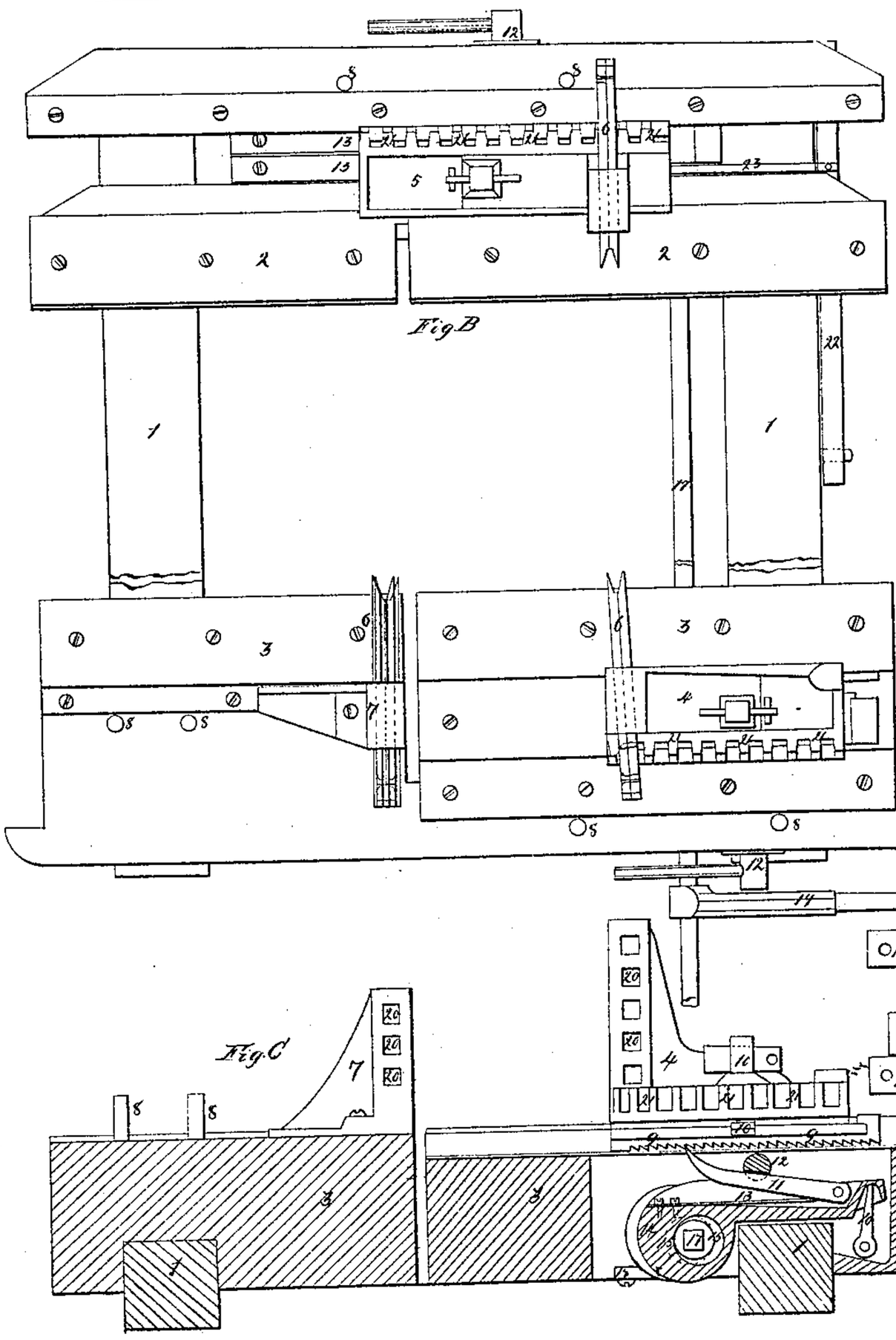


Fig E

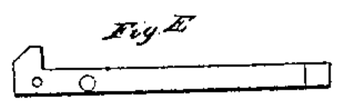
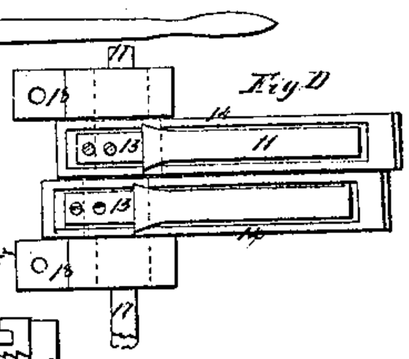


Fig C

Fig D

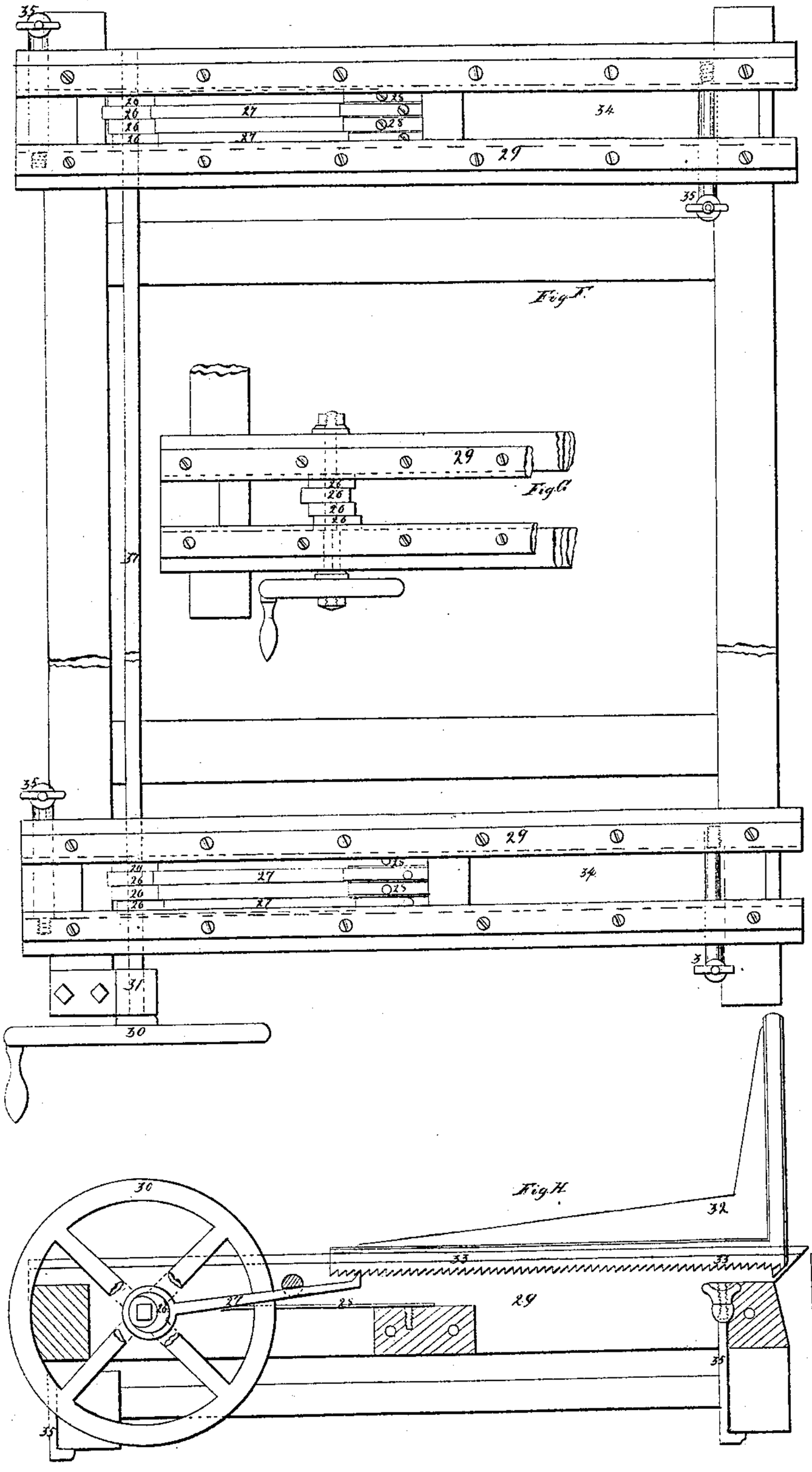


2 Sheets-Sheet 2.

E. H. Stearns,

Saw-Mill Head-Block.

No. 14,700. Patented Apr. 15, 1856.



UNITED STATES PATENT OFFICE.

E. H. STEARNS, OF CINCINNATI, OHIO.

HEAD AND TAIL BLOCK FOR SAWMILLS.

Specification forming part of Letters Patent No. 14,700, dated April 15, 1856; Reissued September 12, 1871, No. 4,551.

To all whom it may concern:

Be it known that I, E. H. STEARNS, of the city of Cincinnati, in the county of Hamilton and State fo Ohio, have invented a new and useful Improvement in what I denominate "Double-Acting Eccentric Head and Foot Blocks for Sawmills;" and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, and to the letters and figures of reference marked thereon.

Similar letters and figures refer to corresponding parts of the improvement.

The nature of my improvement consists in the several parts composing the head and foot blocks. Firstly, the means employed for moving the sliding heads that present the log to the saw laterally, so that each end of the log will be moved the same distance with certainty and precision, and also any required distance with perfect accuracy. Secondly, the mode of holding the log by means of self-tightening or expanding dogs formed of two distinct pieces, or which pieces may be joined together at their heads, but not sufficiently close or firm to prevent the points of the dog from expanding or parting when driven into the log, so that they are forced from each other, or expand, owing to the bevel given to the ends driven into the logs, which firmly clamps the dogs in the opening they pass through, and thus prevents the log from having any motion upon the saw-carriage while being sawed, which motion is always the result of allowing the dogs to have play in the openings they pass through. Thirdly, I also provide the foot block with a self-adjusting trip, the office of which is to throw the feed motion out of gear that moves the carriage, so as to prevent the saw from running against the dog when it comes opposite to it, thereby preventing damage to the saw. The ordinary trip is set a few inches back of the new safety trip, in order to saw the boards entirely off and leave no stub.

As regards moving the log laterally to the saw in an accurate manner, there have been many plans invented and tried, to effect the object, but all have proved ineffectual owing to imperfections in the different parts of the mechanism employed for the purpose. A common method is, to provide the sliding heads with screws furnished with mitre pinions at their ends, and worked by similar pinions placed on a square shaft and made to slide, and the said shaft extending from the head to the foot block, so that each sliding head on the head and foot block could be moved simultaneously, which would move each end of the log likewise. And in some cases, instead of using screw and miter or bevel gear, spur gear and racks are employed, the racks being attached to the sliding heads. The defect of these plans, lies chiefly in the accuracy required in working them to move the log a given distance, and also in the spring of the shaft (when made of a reasonable size,) which causes an unequal movement of the two ends of the log, and therefore produces unequal thicknesses of lumber. Now, the spring of the shaft has no effect or disadvantage in the method I employ for moving the sliding heads, and the necessity of strict attention and accuracy on the part of the operator is likewise dispensed with in setting the log an exact given distance, all of which is effected by using eccentrics placed upon the shaft that connect the head and foot blocks together for moving the sliding heads, which eccentrics work pawls or catch-levers that operate in a ratchet rack attached to the under part of the sliding heads. And from the nature of the motion given by a cam (which is similar to a crank) it will be readily seen that with half a revolution of the rod to which they are attached, or by giving the rod an entire revolution, and having the notches or teeth on the ratchet rack made the same length and operated upon simultaneously, they will move each sliding head the same precise distance. For instance, if the eccentrics were made to throw one inch scant, and the notches were each a half inch long, the sliding heads would be moved one half-inch at each revolution of the shaft, and in this case there would be nearly three quarters of the revolution of the shaft in which its motion could be stopped without having any effect on the distance the sliding heads have been moved. And, by providing the shaft with two eccentrics at each end,

with a scant inch throw, and giving it one revolution, it would move the sliding head one inch, and in this case, nearly one-fourth of the revolution of the shaft could be stopped in its motion, and at the same time accurately move both ends of a log the same distance. And, in the same manner, there can be four eccentrics used, and in this case there would be nearly one twelfth of the revolution of the shaft in which its motion could be stopped and which would have no effect on the accuracy of the motion given to the sliding heads at each end of the log.

Inasmuch as the shaft would not spring sufficiently, if it were provided with any number of eccentrics, to have any effect on the distance of the motion given to the sliding heads, and the latter part of the throw produced by the eccentric is so gradual that if the shaft should spring enough to prevent the eccentric from getting over center, it would do no harm, as there is always sufficient time during the idle motion of the eccentric to allow the shaft to recover or straighten up, and thereby move each sliding head the same exact distance.

To enable others skilled in the art to make and use my improvement, I will proceed to describe its construction and operation by referring direct to the accompanying drawings.

Figure A, (Plate 1,) represents a longitudinal sectional view of the foot block with the improvements attached. Fig. B, is a top view of the head and foot block on the carriage ways. Fig. C, is a longitudinal sectional view of the head block with the improvements attached. Fig. D, is a top and separate view of the lever springs and catches, worked by the eccentrics in the foot block. Fig. E, is a side view of one of the improved self-tightening or expanding dogs.

1, 1, represent the carriage ways, provided with a head block 2, and foot block 3.

4 represents the sliding head, provided with dogs 6, passing through the openings 20, for holding the log. The sliding heads receive their motion from the cams 15 on the connecting shaft 17, through the medium of the levers 14 and catch levers 11, which work in the ratchet rack 9 attached to the sliding block; (the levers 14 in the foot block are not used.)

13 are springs for holding the catch levers 11 up against the ratchet 9, so as to render their operation certain.

The levers 14 in the head block are supported at their ends by the vibrating arms 16. The eccentrics 15 revolve in bearings 18, 18, which are attached to the under part of the head and foot block. The sliding blocks are provided with teeth 21 for moving them with a bar, which bar will be placed against the pins 8. In the top of the blocks 7 is a stationary stock, into which a part, or all the dogs from the head opposite may be shifted as occasion requires.

10, represent T head pins provided with wedges for tightening the sliding blocks 4 and 5. The heads of these pins will catch under the metal placed on the top of the blocks for the sliding head to work on.

12, represent bolts passing transversely into the head and foot blocks, for throwing the levers 11 out of gear from the ratchet rack 9. These bolts are of a cylindrical form, and flattened on one side, which flattened side is turned next to the catch-levers 11, which permits the levers to catch in the ratchet-rack 9, and when the catch-levers are to be thrown out of gear with the ratchet rack, the flattened portion of the bolts are turned up, the operation of which will be readily comprehended by referring to the accompanying drawings. 19 represents the lever for working the shaft 17.

23, is a lever, working on an axis *s*, which serves as a safety-guard, and is self-adjusting, the object of which is, to prevent the saw from coming in contact with the dog that holds the log. As the dog comes opposite the saw, the R end of the lever 23 (which is inclined upward) rises in the recess 25 made in the sliding head 5, under the dogs, and the lever 22, attached to the side of the saw-carriage, falls, (which lever 22 is suspended by a bolt to the lever 23) and the motion of the carriage brings the lever 22 in contact with a stop lever or its equivalent that throws the feed gear out of operation and thus stops the motion of the saw-carriage.

Plate 2, represents different views of a saw-carriage for circular saw mills, showing the application of the eccentrics for moving the sliding heads for presenting the log laterally to the saw. Fig. F, is a top view of the saw carriage provided with head and foot blocks. Fig. H, is a longitudinal sectional view of the head block. Fig. I, is an end view of the same. Fig. G, represents a plan for working the eccentrics in the head and foot blocks independent of each other by means of a crank or wheel, so that one end of the log can be set and the saw started, and the operator can step to the other end of the log and set it likewise. This plan may be used in a sash as well as a circular mill, which method dispenses with the shaft for connecting the head and foot blocks together.

26, 26, in Plate 2, represents the eccentric attached to the shaft 37, which shaft has a permanent bearing at one end at 31, and worked by the wheel and handle 30.

27 are the catch levers that work in the ratchet racks 33 for moving the sliding head 32, which work on the space 34 as represented in the head and foot block 29.

28 are the springs for holding the catch levers to the ratchet rack 33, and the catch levers are drawn out of connection with the ratchet rack by means of a bolt as described and represented in Plate 1.

35 are bolts for holding the head and foot block to the saw carriage, which bolts are made to turn up, in order to pass the cross-pieces that connect the side pieces of the carriage together by having the bolts pass through an opening in a cylindrical piece of iron that is screwed into the sides of the head and foot blocks, and made capable of turning, so that the bolt can be turned up and passed over the cross-piece when moving either of the blocks.

The eccentric, as applied to the shaft and represented in Plate 1, is worked by a lever, but could be worked with a wheel as the plan is represented in Plate 2. Where there are more than two eccentrics used, it will be found move convenient to work them with a wheel, for the purpose of giving the shaft to which they are attached a rotary instead of a reciprocating motion. I do not confine myself to any particular number of eccentrics and setting arms—one, two, four, more or less may be used if desired.

In providing the head and foot blocks with eccentrics and ratchet racks, the throw of the eccentrics should be made so that it will move the ratchet or log a given even distance—for instance, make the teeth on the rack $\frac{1}{2}$ an inch long, and give the eccentric such throw, and make the setting arms the proper length so that one eccentric in a revolution will move the sliding block $\frac{1}{4}$ of an inch, or in other words have the two eccentrics with their setting arms, to operate in one notch and move the sliding head or log, which is easily done by giving the setting arms the required length.

The throw of the eccentric, ratchet teeth, and setting arm, will be made so as to move the log $\frac{1}{4}$ of an inch with one eccentric, but can be made to throw $\frac{1}{2}$ of an inch, or any other distance under or over those given. But $\frac{1}{4}$ of an inch will be more convenient, as most lumber required for use, varies $\frac{1}{4}$ of an inch in thickness, such as $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, 2 inches, and so on, which will render the setting of the log convenient at all the different thicknesses.

The self-adjusting strip, which is composed of the levers 22 and 23, is operated by the motion of the sliding block 5, which is provided with a recess 25 made in its under side, into which recess the R end of the lever 23 rises, and by this means properly sets the lever 22 for acting on the feed motion for stopping the saw-carriage, as before stated. The operation of these levers are made to depend upon the motion of the sliding head to give them their proper set, so as to stop the saw-carriage at the proper point to prevent the saw from striking the dogs. I claim this or any other plan for setting the self-adjusting trip where their motion is obtained from the sliding block for carrying the log.

The dogs for holding the logs can be made to contract and tighten themselves in the openings they pass through, as well as to expand and tighten themselves, by having two separate openings made sufficiently near each other so that both dogs can be driven in and out by the same blows of the mill-bar, each being provided with a gib-head as shown in Fig. E, plate 1. When the dogs are constructed for contracting or closing, for tightening themselves in the opening they pass through, then the points of the dogs will have to be beveled or chamfered on the opposite side compared to those intended for expanding in the openings to tighten themselves.

One great advantage gained by using the self-tightening dogs, is, that they can be both driven in and out of the log with the same blows of the mill-bar when connected together and made to pass through one opening, or when in two pieces and made to pass through separate openings. When the dogs are made to pass through two openings, they may be connected together by means of a bolt or otherwise, in such a manner however as to allow the two parts to separate sufficiently to pass through their respective openings, and this manner of constructing dogs prevents the log from slipping sidewise when driven into the log as the two parts of the dog react against each other.

What I claim as my improvement, and desire to secure by Letters Patent, are—

1. The eccentrics 15, 15, one, two, four, more or less, or their equivalents, in combination with the setting arms 11, 11, and ratchet racks 9, 9, or their equivalents, for the purpose of moving and setting the log laterally to the saw, substantially as set forth in the foregoing specifications; the said eccentrics being worked substantially as specified, and represented in the accompanying drawings, or by other equivalent means.

2. I claim the combination of two or more pieces composing the sliding dogs, passing through one or more openings on the same side of the saw, so near each other that they may be driven in or out of the log by the same blows of the mill-bar, the ends of these dogs being so beveled or chamfered as to cause them to bind and tighten themselves in the openings through which they pass, which dogs may be made in separate parts or joined partially at their heads, but not so close or firm as to prevent the parts from binding in their openings when driven into the log, as substantially set forth in the foregoing specifications.

3. I claim the combination of the levers 22 and 23, and recess 25 made in the under part of the sliding head 5 in the foot block, and operated by the motion given to the sliding head, which combination forms an extra safety trip for stopping the saw-carriage when the dogs come opposite the saw, to prevent the saw from striking the dogs, all substantially as and for the purposes set forth in the foregoing specifications, or any other mechanical equivalents, which are operated by the motion given to the sliding head 5, as before mentioned.

EDWARD H. STEARNS.

Witnesses:
MARTIN BENSON,
L. W. SMITH.

[FIRST PRINTED 1912.]