No. 690,679. Patented Jan. 7, 1902.

E. E. THOMAS.

RECIPROCATING LUMBER MOVER FOR SAWMILLS.

(Application filed Nov. 5, 1901.)

(No Model.) 3 Sheets—Sheet 1.

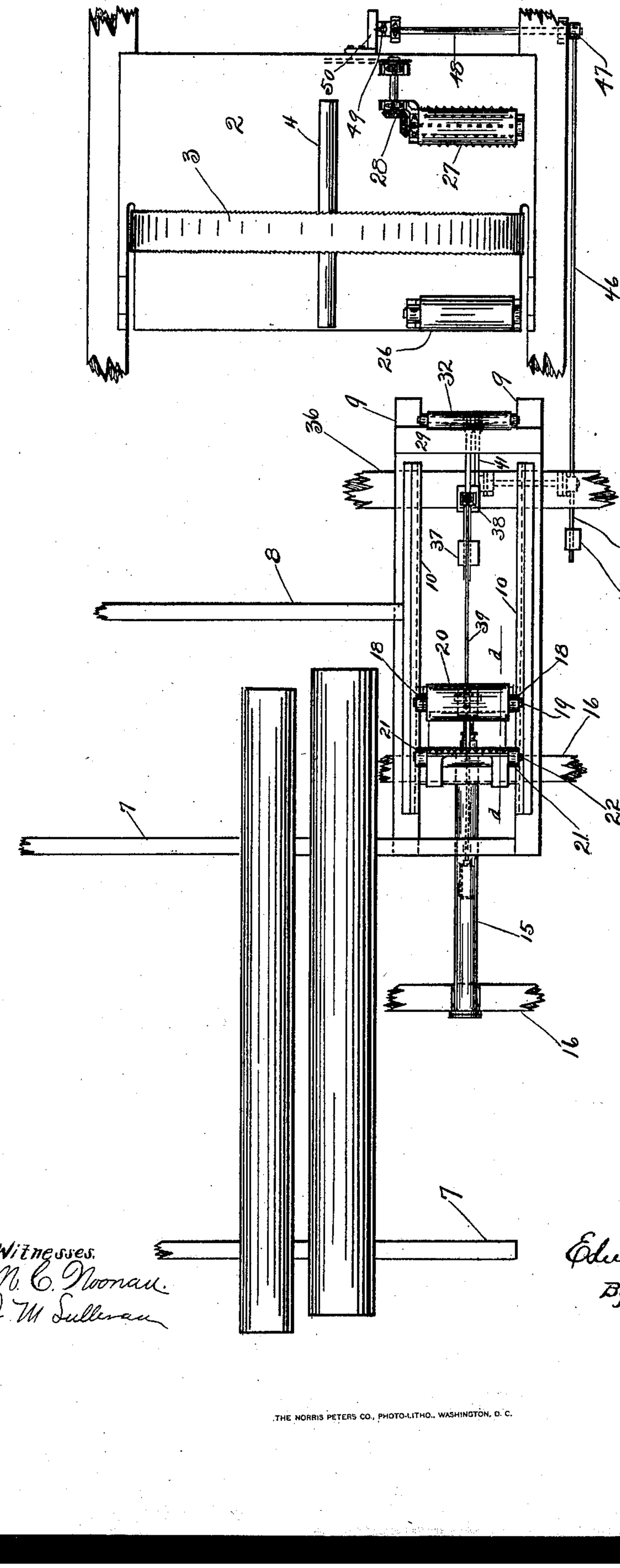

Fig. 1.

Witnesses.
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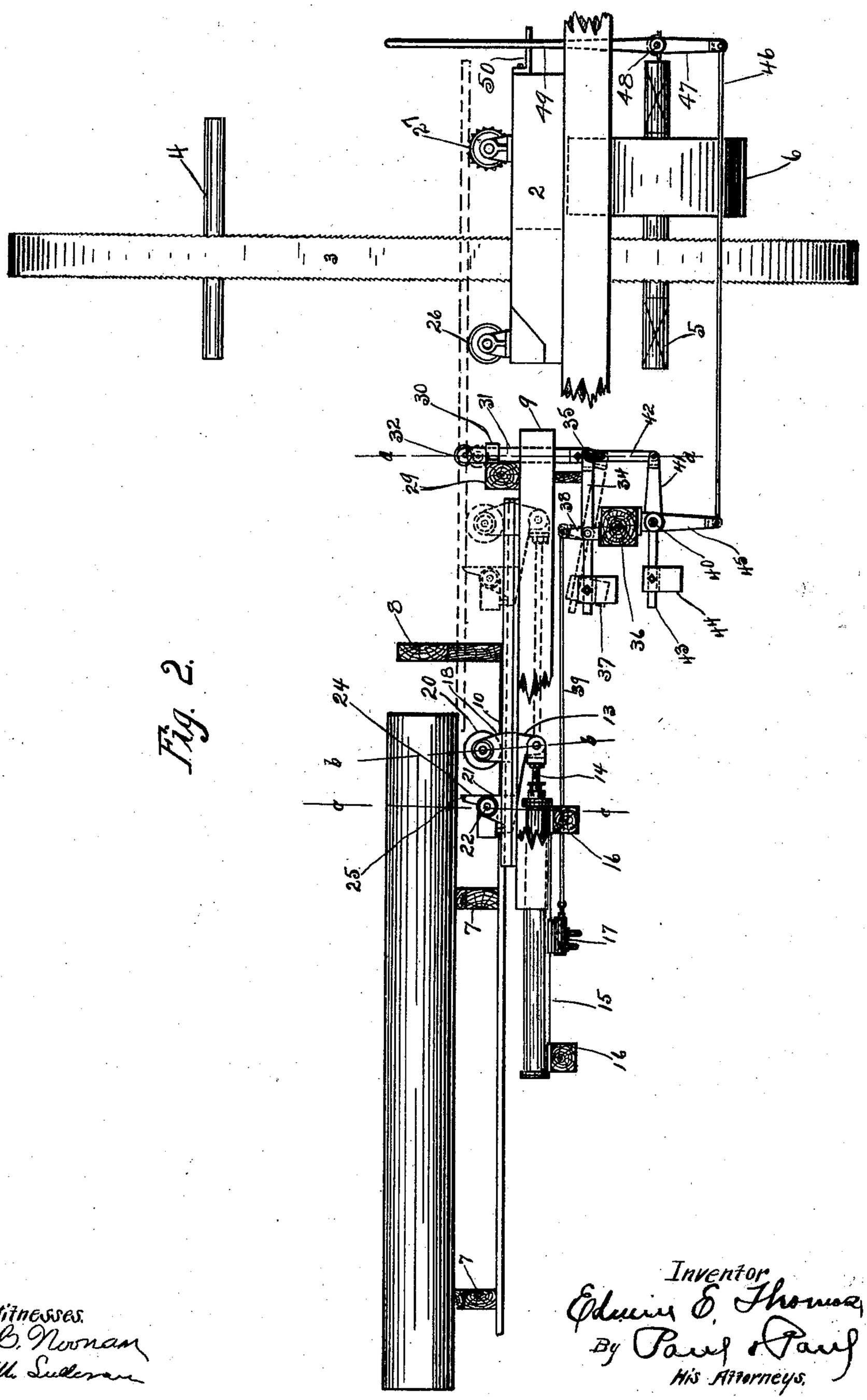
(No Model.) 3 Sheets—Sheet 2.

Fig. 2.



Witnesses.
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(No Model.) 3 Sheets—Sheet 3.

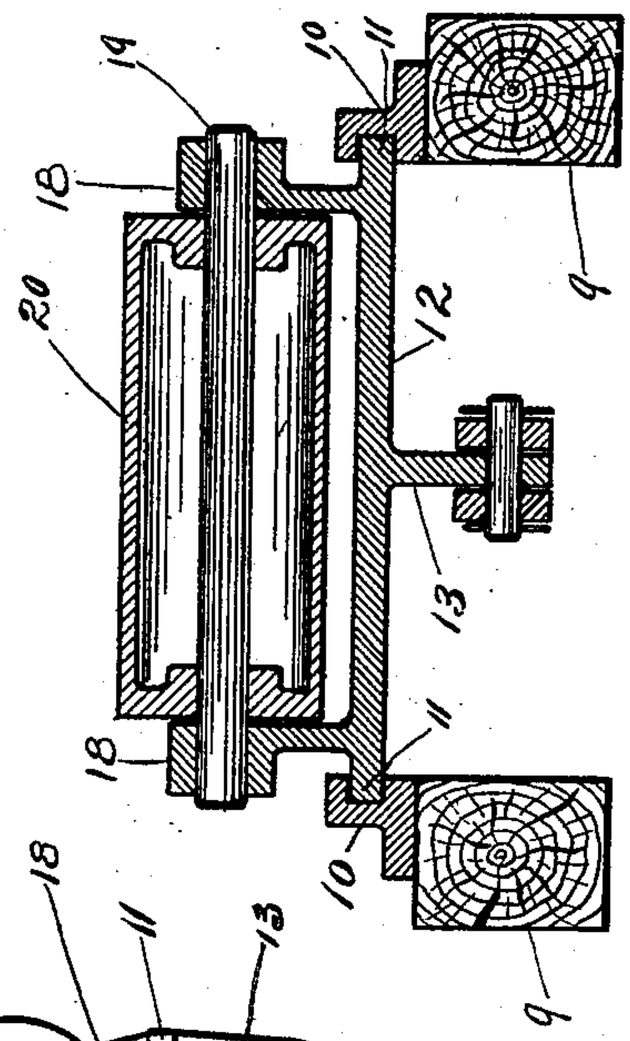

Fig. 4.

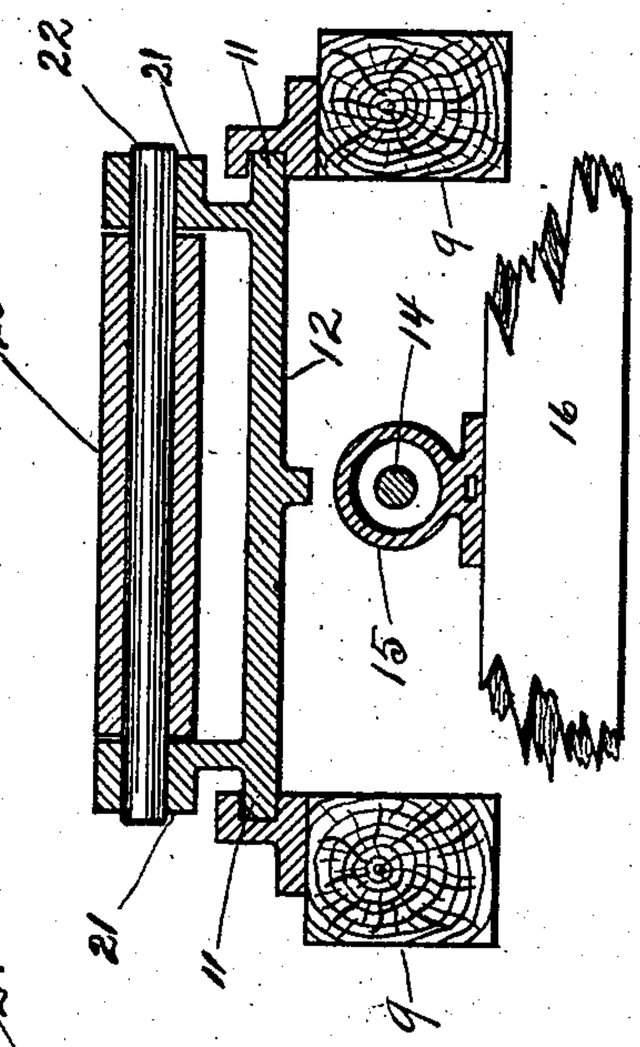

Fig. 5.

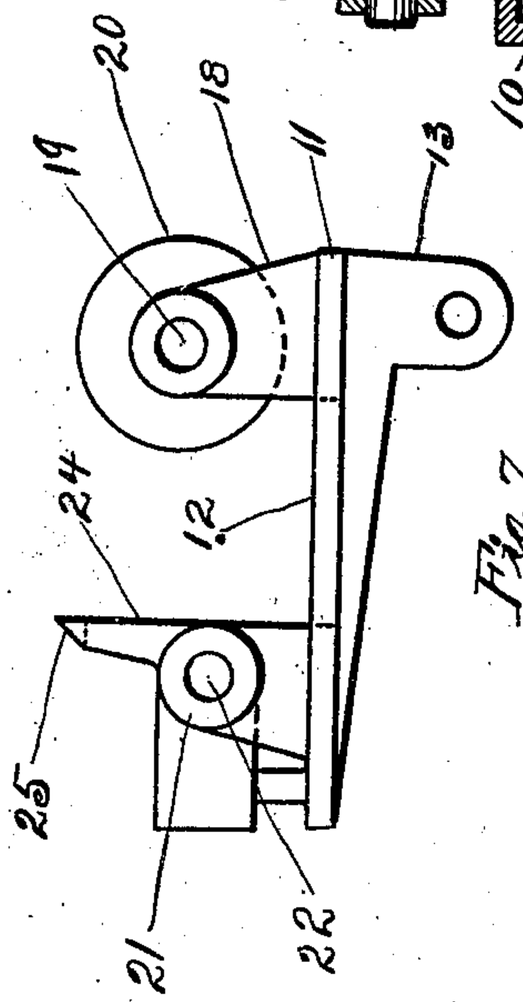

Fig. 7.

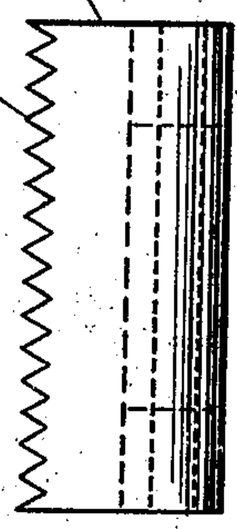

Fig. 8.

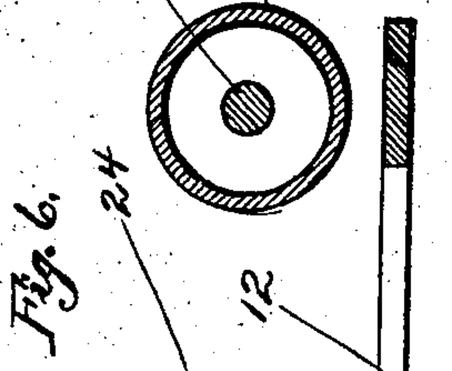

Fig. 6.

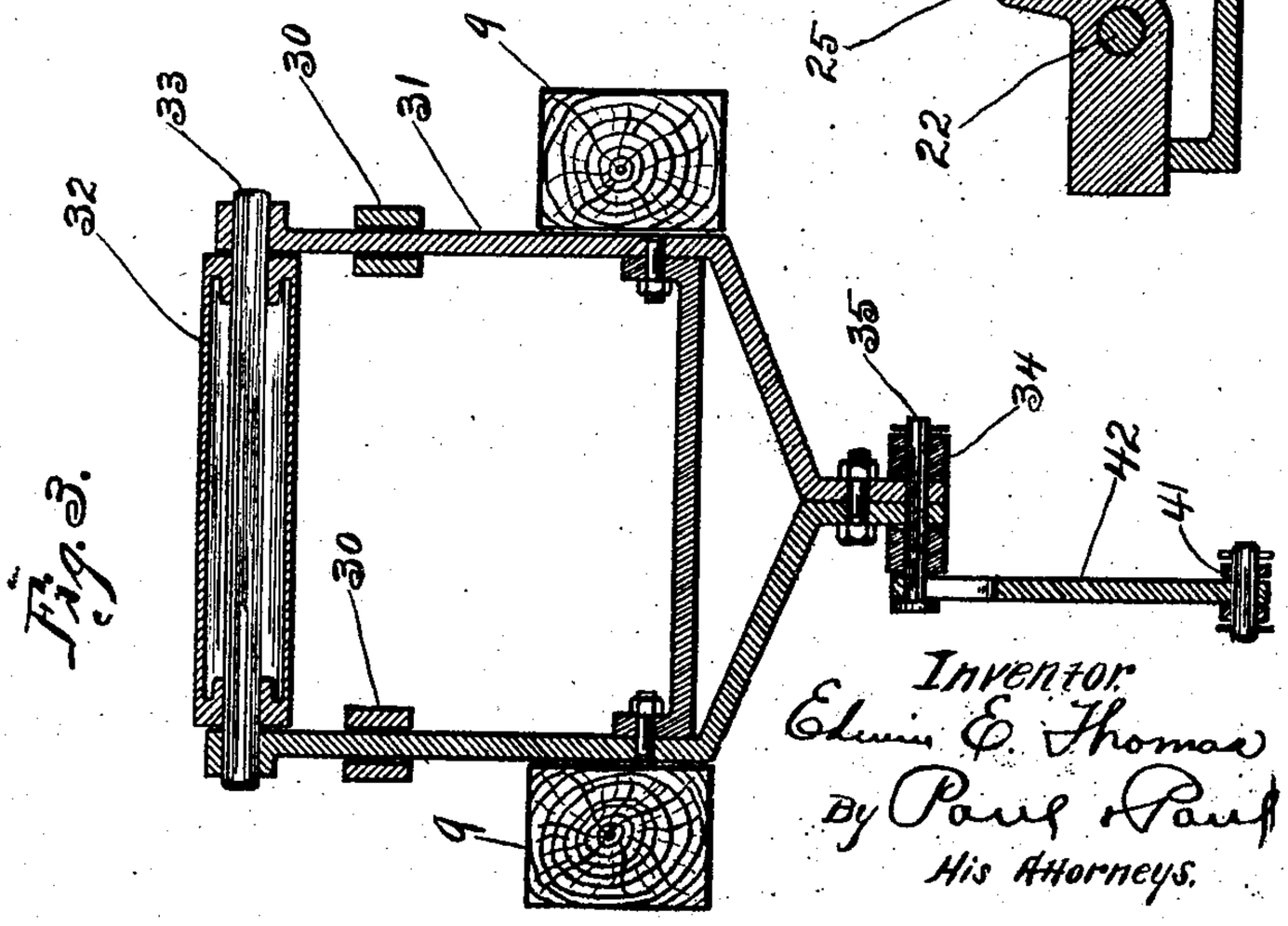

Fig. 3.

Witnesses.
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His Attorneys.

UNITED STATES PATENT OFFICE.

EDWIN E. THOMAS, OF ST. PAUL, MINNESOTA, ASSIGNOR OF ONE-HALF TO UNION IRON WORKS, OF MINNEAPOLIS, MINNESOTA, A CORPORATION OF MINNESOTA.

RECIPROCATING LUMBER-MOVER FOR SAWMILLS.

SPECIFICATION forming part of Letters Patent No. 690,679, dated January 7, 1902.

Application filed November 5, 1901. Serial No. 81,181. (No model.)

To all whom it may concern:

Be it known that I, EDWIN E. THOMAS, of St. Paul, Ramsey county, Minnesota, have invented certain new and useful Improvements in Reciprocating Lumber-Movers for Sawmills, of which the following is a specification.

The invention relates to sawmill machinery, and particularly to that employed in connection with a double-cutting band-mill. A large percentage of the logs that come to sawmills of the present day are comparatively small, and hence are brought into the mill and sawed up very rapidly. This rapid sawing of the logs necessitates a quicker removal of the lumber as it falls on the return or backward movement of the carriage, and it has been found that the usual lumber moving or conveying means were inadequate or unsatisfactory for this purpose.

The primary object, therefore, of my invention is to provide means for moving the lumber away as it falls from the carriage more rapidly than it can be moved by the usual means employed.

A further object is to provide a lumber-moving apparatus which while particularly adapted for use with a double-cutting band-mill may be used with those of the single-cutting type or with mills where a circular saw is employed.

Other objects of the invention will appear from the following detailed description.

The invention consists generally in providing reciprocating lumber-moving means located in the double-cutting mill between the log-deck and saw, said means being normally at rest and adapted to be released by the lumber as it falls from the carriage.

Further, the invention consists in providing means for releasing the operating means by hand.

Further, the invention consists in various constructions and combinations, all as hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a plan view of a double-cutting band-mill with my invention applied thereto. Fig. 2 is a side elevation of the same. Fig. 3 is a section on the line *a a* of Fig. 2. Fig. 4 is a section on the line *b b* of Fig. 2. Fig. 5 is a section on the line *c c* of Fig. 2. Fig. 6 is a section on the line *d d* of Fig. 1. Fig. 7 is a side elevation of the cross-head, showing the dog and roll carried thereby. Fig. 8 is a side view of the cross-head dog.

In the drawings, 2 represents a double-cutting band-mill having a saw 3 and suitable upper and lower wheels provided with shafts 4 and 5, the latter having a driven pulley 6. This band-mill is of the ordinary or preferred construction and is illustrated for the purpose of showing the application of my invention. 7 represents the log-deck skids, and 8 the guard between the deck and the band-saw. The skids 7 project across the space between the deck proper and the saw-mill carriage, which for clearness and convenience of illustration I have omitted from the drawings. The skids 7 extend a sufficient distance above the top of the lumber-moving means, hereinafter to be described, to permit the logs to be rolled directly thereover to the carriage. Beneath the skids 7 I provide timbers 9, which extend substantially at right angles to the skids 7 and below the level of the same. Upon these timbers I arrange guide-rails 10, wherein the flanges 11 of a cross-head 12 are slidable. This cross-head on its under side is provided with a lug 13, that is connected to a piston-rod 14 of a steam-cylinder 15. This cylinder is supported upon suitable timbers 16 beneath the log-skids and has a valve 17. Upon the forward end of the cross-head I provide standards 18, connected by a rod 19, whereon an idle roll 20 is mounted. The opposite end of the cross-head has standards 21, connected by a rod 22, whereon a dog 23 is pivoted. This dog on one side of its pivot has an upwardly-turned lip or flange 24, provided with a series of teeth 25, and on the opposite side of the pivot is weighted to cause the part 24 to stand normally in an upright position, as shown in Figs. 6 and 7. The teeth 25 when in their normal position project above the top of the roll 20, so that the lumber falling upon said roll will be engaged firmly by the teeth of the dog.

Upon the band-mill base upon one side of the saw is an idle roll 26 and on the other side of the saw a spiked roll 27, operated from a suitable driving mechanism 28. Upon the timbers 9, near the idle-roll 26, I provide a cross-timber 29, carrying guides 30 for a vertically-slidable frame 31, which at its upper end carries a roll 32 upon a rod 33. The lower end of the frame 31 is secured in the forked end of a lever 34 by means of a pivot-pin 35. This lever is centrally pivoted on a timber 36 and is provided with an adjustable weight 37. An arm 38 on said lever is connected with a cylinder-valve 17 by a rod 39, so that oscillation of said lever will open and close the valve. The roll 32, as indicated in Fig. 2, normally projects above the level of the roll 20 and the dog-teeth 25 and will be first engaged by the lumber as it falls from the carriage. The weight of the lumber falling upon said roll 32 will cause a depression of the frame 31, rock the lever 34, open the valve, and admit steam to the cylinder. By the time the frame has been depressed sufficiently to bring the lumber into engagement with the teeth of the dog steam will have been admitted to the cylinder, and the lumber will be moved rapidly toward the band-saw driven by the teeth of the dog in engagement with the under side thereof. The lumber will slide over the idle rolls, pass between the band-wheel onto the spiked live roll, and upon being engaged thereby will be driven forward to mingle with the lumber that is cut on the forward movement of the carriage. The weighted side of the dog will hold its teeth in proper position to engage the lumber, and as soon as the lumber is engaged by the spiked roll and drawn forward the dog will tilt forward and allow the lumber to slide off its teeth. Backward tilting, however, of said dog during the forward movement of the cross-head is prevented by engagement of the dog with the frame of the head, as shown in Fig. 6.

The speed of the cross-head, and consequently the movement of the lumber, may be regulated by increasing or decreasing the supply of steam to the cylinder, a suitable valve being arranged in the supply-pipe for that purpose. If large logs are being sawed, the operator may adjust the lumber-moving mechanism to operate less rapidly than when small logs are passing through the mill.

It sometimes happens that the operator desires to depress the roll 32 by hand, and with this end in view I provide a rock-shaft 40, supported, preferably, on the under side of the timber 36 and provided with an arm 41, connected by means of a slotted link 42 with the pin 35. During the automatic operation of the mechanism the pin slides in said slot and the rock-shaft remains stationary. The shaft is also provided with an arm 43, carrying an adjustable weight 44, with a depending arm 45, that is connected by a link 46 with an arm 47 on a rock-shaft 48. An operating-lever 49 is secured upon said shaft and normally engages a notch in a stud or projection 50. By springing said lever slightly it may be disengaged from said notch and then oscillated to depress the roller 32 and admit steam to the cylinder to actuate the cross-head.

In operation the lumber as it falls from the carriage on its return or backward movement will strike the roll 32, depressing the same, and will engage the toothed dog 24. The depression of said roll 32 will admit steam to the cylinder, and the cross-head will immediately be driven toward the band-saw, carrying the lumber with it to the position indicated by dotted lines in Fig. 2. By the time the cross-head reaches the end of its stroke toward the saw the lumber will have engaged the spiked roll and, driven by said roll, will continue to move away from the band-mill. As soon as the lumber passes off the roll 32 the weight 37 will return said roll to its normal position, admitting steam to the cylinder to return the cross-head to its normal position.

Whenever desired, the operator may admit steam to the cylinder and actuate the cross-head by means of the lever 49 and its connections with the valve-operating mechanism. I have shown this lumber-moving apparatus in connection with a double-cutting band-saw mill, but obviously the same may be used to advantage with those of a single-cutting type or with circular-saw mills.

I claim as my invention—

1. The combination, with a reciprocating lumber-moving means and means for operating the same, of idle rolls or supports whereon the lumber falls, and means operated by the descent of the lumber toward said rolls for releasing said operating means.

2. The combination, with a reciprocating cross-head provided with a lumber-engaging dog, of means for operating said head, rolls or supports whereon the lumber falls, and means operated by the descent of the lumber for releasing said operating means.

3. The combination, with a band-mill, of reciprocating lumber-moving means and means for operating the same, idle rolls whereon the lumber falls, and means operated by the descent of the lumber toward said rolls for releasing said operating means.

4. The combination, with a band-mill, of a reciprocating cross-head and means for operating the same, a lumber-engaging dog provided on said head, idle rolls, and means depressed by the weight of the lumber falling on said rolls for releasing said operating means.

5. The combination, with a double-cutting band-mill and the log-deck, of a reciprocating cross-head arranged between said mill and deck, means for operating said head, a lumber-engaging dog provided on said head, idle rolls, and means operated by the lumber falling upon said rolls for releasing said operating means.

6. The combination, with a double-cutting band-mill, of a reciprocating cross-head located between the mill and log-deck, means

for operating said head, a lumber-engaging dog provided on said head and having a series of teeth, idle rolls below the level of said teeth, and means depressed by the weight of the lumber falling on said rolls for releasing said operating means.

7. The combination, with reciprocating lumber-moving means and means for operating the same, of idle rolls, and a vertically-movable roll depressed by the weight of the lumber falling thereon for releasing said operating means.

8. The combination, with a double-cutting band-mill, of reciprocating lumber-moving means located between said mill and the log-deck, a motor for operating said lumber-moving means, idle rolls whereon the lumber falls that is cut on the return or backward movement of the carriage, a vertically-movable roll projecting above the level of said idle rolls and adapted to be depressed by the weight of the lumber falling thereon, and operative connections provided between said vertically-movable roll and said motor.

9. The combination, with a double-cutting band-mill, of a reciprocating cross-head located between said mill and the log-deck, a motor for operating said head, a lumber-engaging dog and an idle roll provided on said head, said dog normally projecting above the level of said roll, vertically-movable means adapted to be depressed by the weight of the lumber falling from the carriage on its return or backward movement, and operative connections provided between said vertically-movable means and said motor.

10. The combination, with a double-cutting band-mill, of reciprocating lumber-moving means provided between said mill and the log-deck, a cylinder having its piston connected with said lumber-moving means, idle rolls whereon the lumber falls on the return or backward movement of the carriage, a vertically-movable frame, a roll carried thereby and normally projecting above the level of said idle rolls, and operative connections provided between said frame and said cylinder-valve, substantially as described.

11. The combination, with reciprocating lumber-moving means and means for operating the same, of idle rolls whereon the lumber falls, means normally projecting above said rolls and actuated by the falling lumber to automatically release said operating means, and means within control of the operator for releasing said operating means by hand.

12. The combination, with a double-cutting band-mill, of reciprocating lumber-moving means located between the mill and log-deck, a motor for operating said reciprocating means, idle rolls whereon the lumber falls on the return or backward movement of the lumber, the vertically-movable frame, a roll carried thereby and normally projecting above the level of said idle rolls, operative connections provided between said frame, a motor, and means within the control of the operator for depressing said frame by hand, substantially as described.

13. The combination, with a double-cutting band-mill provided with a spiked live roll, of reciprocating lumber-moving means provided between said mill and the log-deck, a motor for operating said reciprocating means, idle rolls whereon the lumber falls on the return or backward movement of the carriage, a vertically-movable roll normally projecting above the level of said idle and spiked rolls and adapted to be depressed by the weight of the lumber falling thereon, and operative connections provided between said vertically-movable roll and said motor.

14. In a double-cutting band-mill, a lumber-moving device arranged between the saw and the log-deck and whereon the lumber falls that is cut on the return or backward movement of the carriage, means for operating said lumber-moving device, and means actuated by the falling lumber for releasing said operating means.

In witness whereof I have hereunto set my hand this 1st day of November, 1901.

EDWIN E. THOMAS.

In presence of—
RICHARD PAUL,
M. C. NOONAN.