

(No Model.)

2 Sheets—Sheet 1.

W. E. HILL.
STEAM LOG LOADER AND TURNER.

No. 514,463.

Patented Feb. 13, 1894.

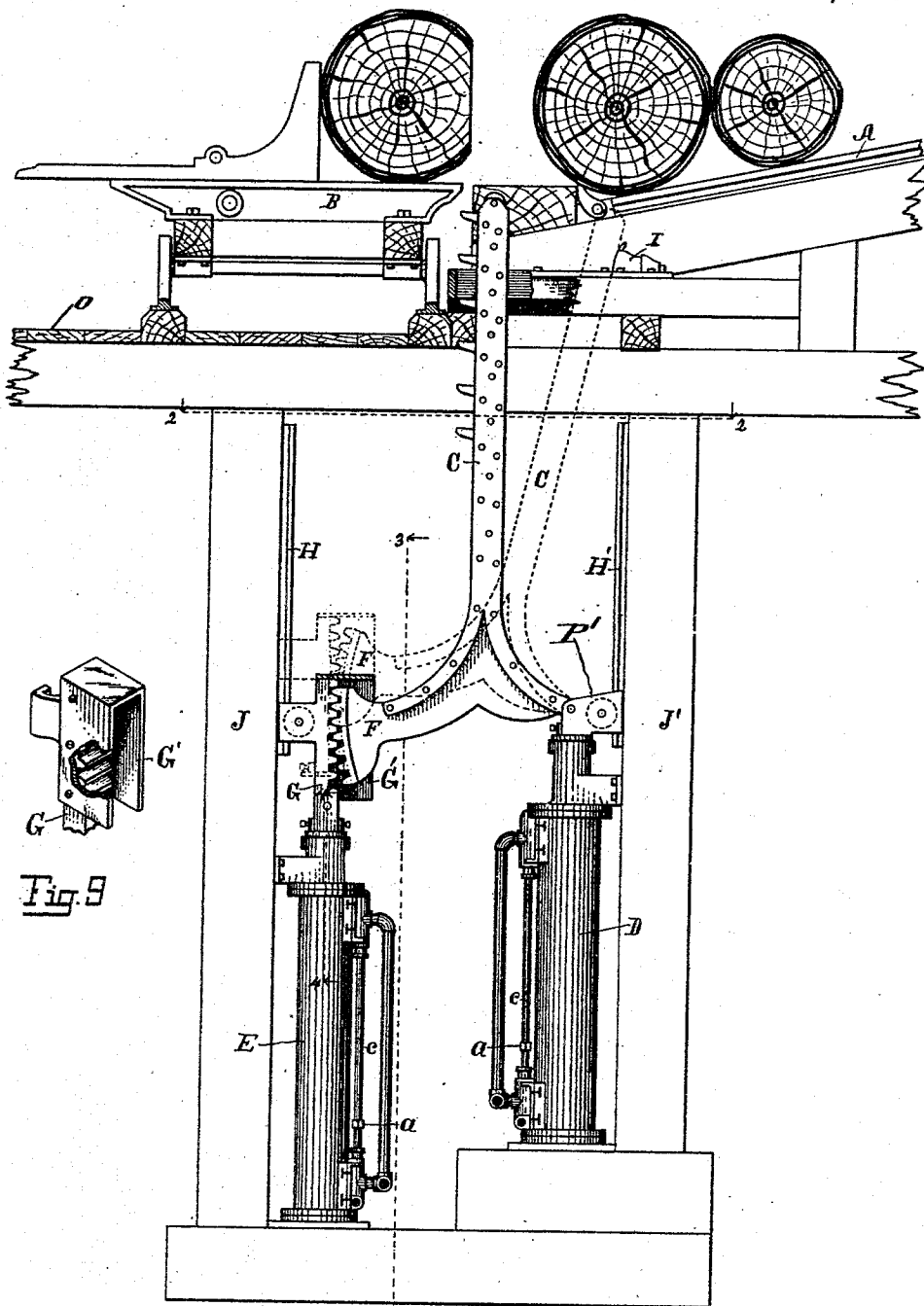


Fig. 9

Fig. 1

Witnesses:

Edw. W. Westbrook
Chas. S. Wood

Inventor

William E. Hill
By *Edw. L. Chappell*
Att'y.

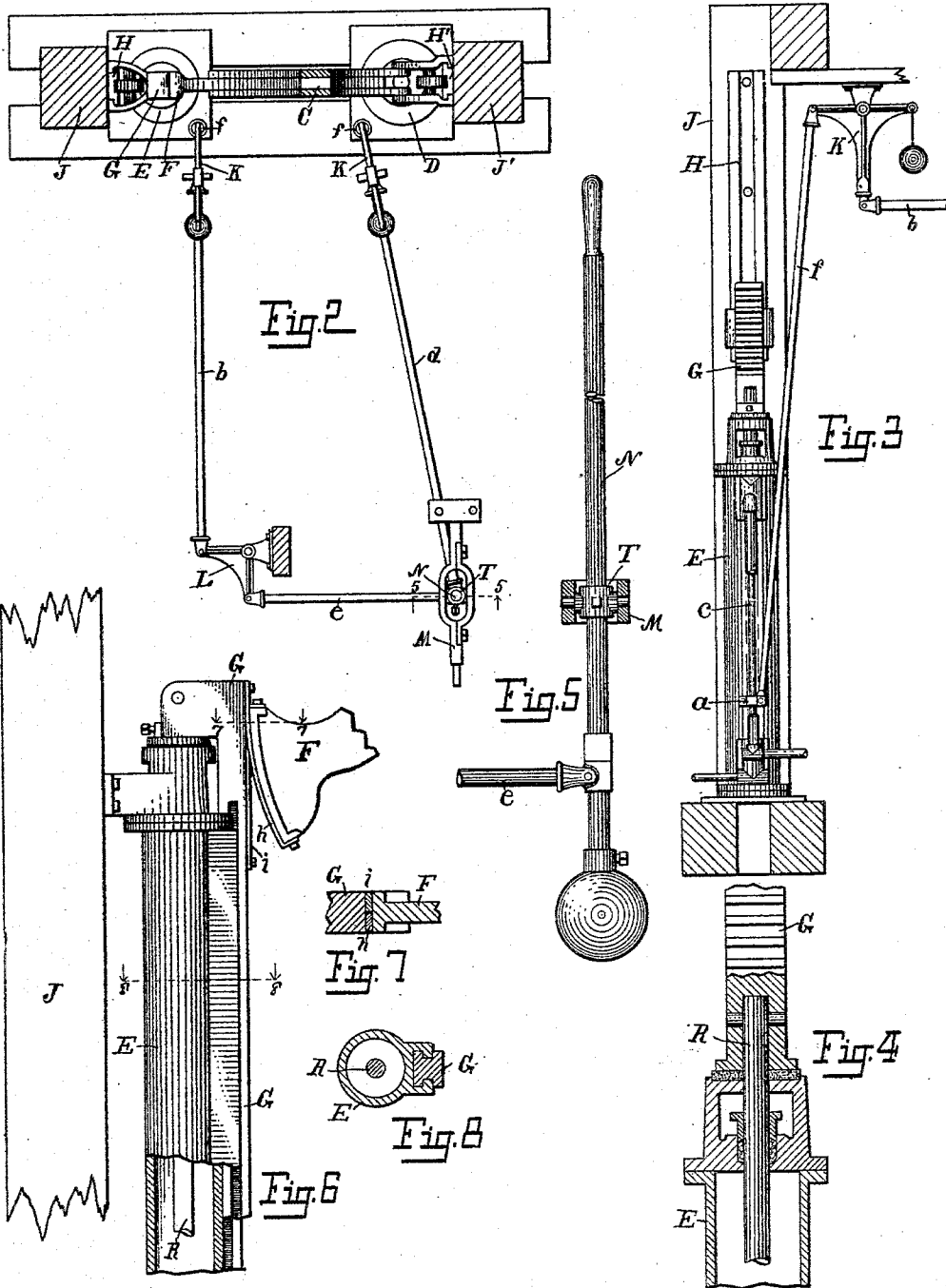
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Witnesses:

Edw. Evelyn Westbrock
Halter S. Howard

Inventor.

William E. Hill
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UNITED STATES PATENT OFFICE.

WILLIAM E. HILL, OF KALAMAZOO, MICHIGAN.

STEAM LOG LOADER AND TURNER.

SPECIFICATION forming part of Letters Patent No. 514,463, dated February 13, 1894.

Application filed February 7, 1893. Serial No. 461,366. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. HILL, a citizen of the United States, residing at the city of Kalamazoo, in the county of Kalamazoo and State of Michigan, have invented certain new and useful Improvements in Steam Log Loaders and Turners, of which the following is a specification.

My invention relates to improvements in steam log loaders and turners in which two upright steam cylinders operated by a single lever actuate an upwardly projecting toothed bar to manipulate logs or timbers in a saw-mill.

The objects of my improvements are to provide a means by which the toothed bar may be tilted with little lateral strain on the cylinders; provide a more direct means of attaching the operating lever to the valve stems of the cylinders and an improved and simple manner of hanging the operating lever. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1, is a side view of my machine in position in a saw-mill the operating mechanism not being shown. Fig. 2, is a view on line 2—2 of Fig. 1, looking down, showing also the operating lever and its connecting mechanism. Fig. 3 is a view on line 3—3 of Fig. 1, looking to the left. Fig. 4, is a section of cylinder E on line 4—4 looking to the left. Fig. 5, is a view of the weighted operating lever T on line 5—5 looking toward the steam cylinders. Fig. 6, is a detailed view of a modification of guide, piston and attachments of cylinder. Fig. 7 is a section on line 7—7 of Fig. 6. Fig. 8, is a section on line 8—8 of Fig. 6. Fig. 9, is a detailed view in perspective of the shield G' of Fig. 1.

Similar letters refer to similar parts throughout the several views.

In the views, A, B, O, J, J' are the skidway, carriage and headblocks, sill and floor, and posts of a saw-mill in the usual form.

E and D are upright stationary steam cylinders having pistons and piston rods projecting through boxes and guides. The piston rod of cylinder D is attached to a guide block P' containing an antifriction roller and reciprocates on the guide H'. A lateral ex-

tension of the bar C is also hinged directly to this piston rod.

To the top of the piston rod of cylinder E, a rack G, is attached on the back of which is a guide block containing an antifriction roller that reciprocates on the guide H. The rack G, meshes with the cogged segment F. The center of the circle of which F is a segment is the center of the pivot which attaches the toothed bar C to the piston rod of cylinder D.

G' is a guard over the gearing to keep dust and other obstructions from the gearing. I prefer to attach the rack G to the piston rod of cylinder E by a pivot as it prevents binding of the parts. However, this mode of connection is immaterial to my invention being only a detail of construction.

N is the weighted operating lever which is hung in a yoke M by means of the collar T. The collar T is pivoted at right angles to the journal bearings of the yoke M. The lever N is attached by the connecting rod b and counterbalanced bell crank K, and connecting rod f to the valve stem C, of cylinder D. The lever N, is also attached by the connecting rod e, bell crank L, connecting rod d, &c., to the valve stem of cylinder E.

To use my machine the operator merely tips the operating lever which by its connection with the valve stems gives perfect control of the cylinders. The action will be understood by examining Figs. 2, 3 and 5. Tipping the lever N in a line at right angles to connecting rod C, will push or pull connecting rod d and cause by its connections only the valves of cylinder D to operate. Tipping the lever M at right angles to connecting rod d will push or pull connecting rod C, and cause by its connections only the valves of cylinder E to operate. I say tipping the lever at right angles, &c., because it is practically correct. The true motion would be in a curved line that would cause the point of attachment to the lever of the connecting rod mentioned to describe an arc of a circle of which the connecting rod is the radius. Tipping the lever in directions between those above indicated will cause the valves of both cylinders to operate. The lever thus operates each cylinder independently of the other, either one alone or both together. That is to say, by tipping

the lever N steam can be admitted to the top or bottom of both cylinders together or each one separately or to the top of one cylinder and to the bottom of the other and vice versa.

5 In operation steam is first admitted to the bottom of cylinder E, which raises the rack G, and tips the bar back as represented by the dotted lines in Fig. 1. Steam is then admitted to the bottom of cylinder D, which carries the bar up against the log or timber as the case may be. A little steam is then admitted to the top of cylinder E, which holds the bar with an elastic pressure against the log. Steam is freely admitted to cylinder D, and the log is rolled to its place. After the log is in position on the carriage it may be turned by admitting steam to the bottom of both cylinders. Comparatively a small amount being admitted to cylinder E. To push the log solid against the headblocks after it is on the carriage steam can be admitted to the top of cylinder E, or to the bottom of cylinder D, or steam may be admitted both at the top of cylinder E, and the bottom of cylinder D. Any other fluid under pressure can be used instead of steam.

I have shown in Figs. 6, 7 and 8 a modified form of cylinder E, and its attachments. In this arrangement the guide is on the side of the cylinder and the bar or rack as the case may be is attached by its top to the top of the piston by a projecting portion. Fig. 8, is a cross section showing grooves on the bar G, and the guides projecting into them.

35 In this modified device flexible straps or bands of any suitable material are attached to the segment and the vertically reciprocating bar so as to tip it the same as the cogs. The band *i* having its upper end attached to the reciprocating bar and its lower end attached to the segment and the band *h* having its upper end attached to the segment and its lower end to the reciprocating bar. The bands *i* and *h* are only equivalents of the cog gear.

45 In the operating lever and its connecting mechanism the bell crank L, is not absolutely essential to the successful operation of the machine. The connecting rod *e* might be connected directly to the bell crank K of cylinder E. It would require greater care in the manipulation of the operating lever N, owing to the decreased angle between the connecting rods. I prefer to change the direction of the connecting rods by the introduction of a bell crank as L. The nearer the angle between

the connecting rods *d* and *e* is to a right angle the less care will be required to operate the machine.

I am aware that steam cylinders with their pistons and piston rods operated by means of a single lever have been in use to actuate a toothed bar for the purpose of handling logs, prior to this invention, so I do not claim that broadly but

What I do claim, and desire to secure by Letters Patent, is—

1. In a steam log loader and turner two upright stationary steam cylinders with piston rods projecting through stuffing boxes and guides at the top and reciprocating in parallel lines, one actuating a block to which the lower portion of the toothed bar is pivoted and the other actuating a perpendicular bar which by any known gear actuates a segment attached to the lower end of the toothed bar, the segment being revoluble on the point of attachment to the piston rod of the first cylinder.

2. In a log loader and turner a toothed bar having a laterally projecting portion at the bottom supporting a segment which is driven by a reciprocating bar acting through any known gear and revoluble on a pivot attached to the toothed bar the bearing of the pivot and the reciprocating bar that drives the segment both reciprocating independently in parallel lines all being suitably guided.

3. The combination of the vertical cylinders E and D, the bar C, the segment F, the reciprocating bar G, and the pistons and piston rods of the cylinders all suitably guided substantially as described for the purpose specified.

4. In a log loader and turner the combination of the vertical cylinders E and D containing pistons and piston rods, an upwardly projecting toothed bar pivoted to the piston rod of cylinder D and bearing a segment F which is connected to the vertically reciprocating bar G by a gear composed of straps *h* and *i*, attached as described, the vertical bar G being suitably guided on the side of cylinder E and reciprocated by its piston substantially as described.

In witness whereof I hereunto set my hand and seal in the presence of two witnesses.

WILLIAM E. HILL. [L. S.]

Witnesses:

E. S. ROSS,
CORA E. WESTBROOK.