

(No Model.)

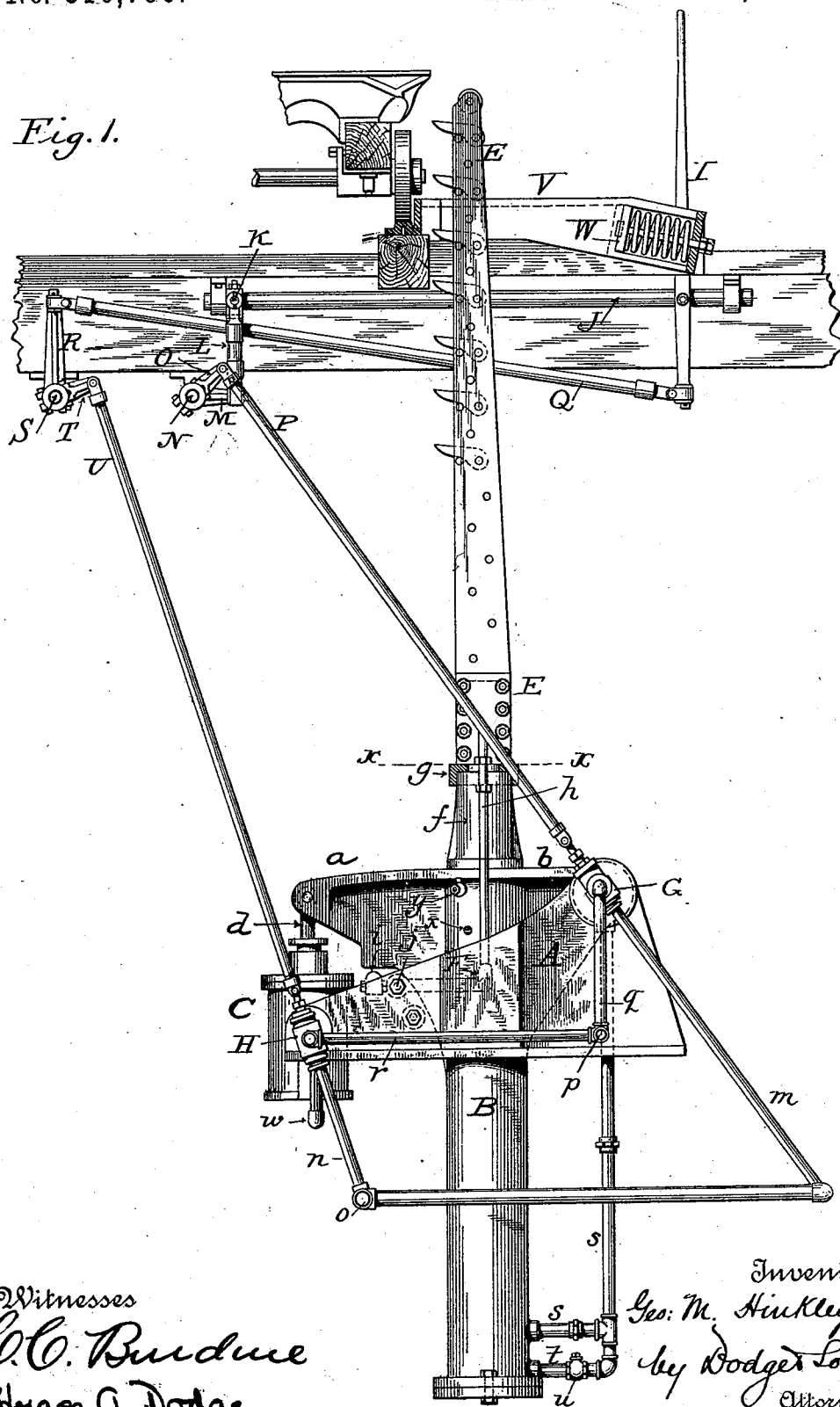
4 Sheets—Sheet 1.

G. M. HINKLEY.
LOG TURNER.

No. 510,790.

Patented Dec. 12, 1893.

Fig. 1.



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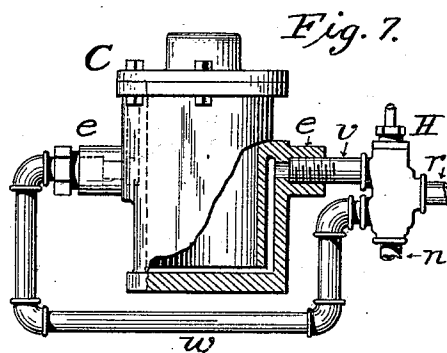
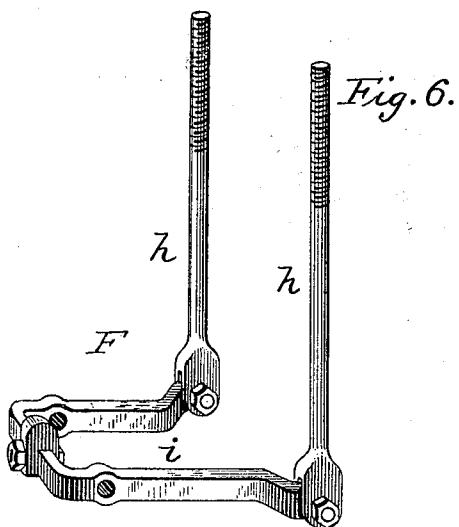
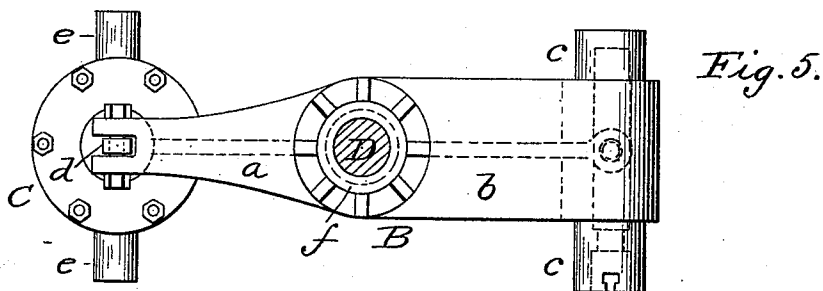
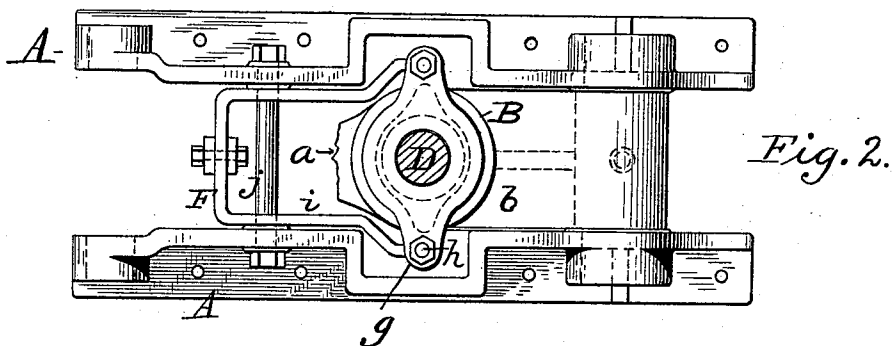
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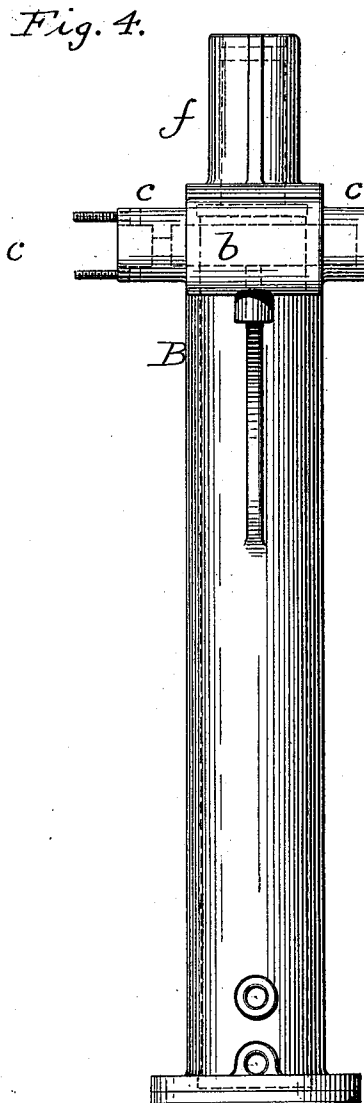
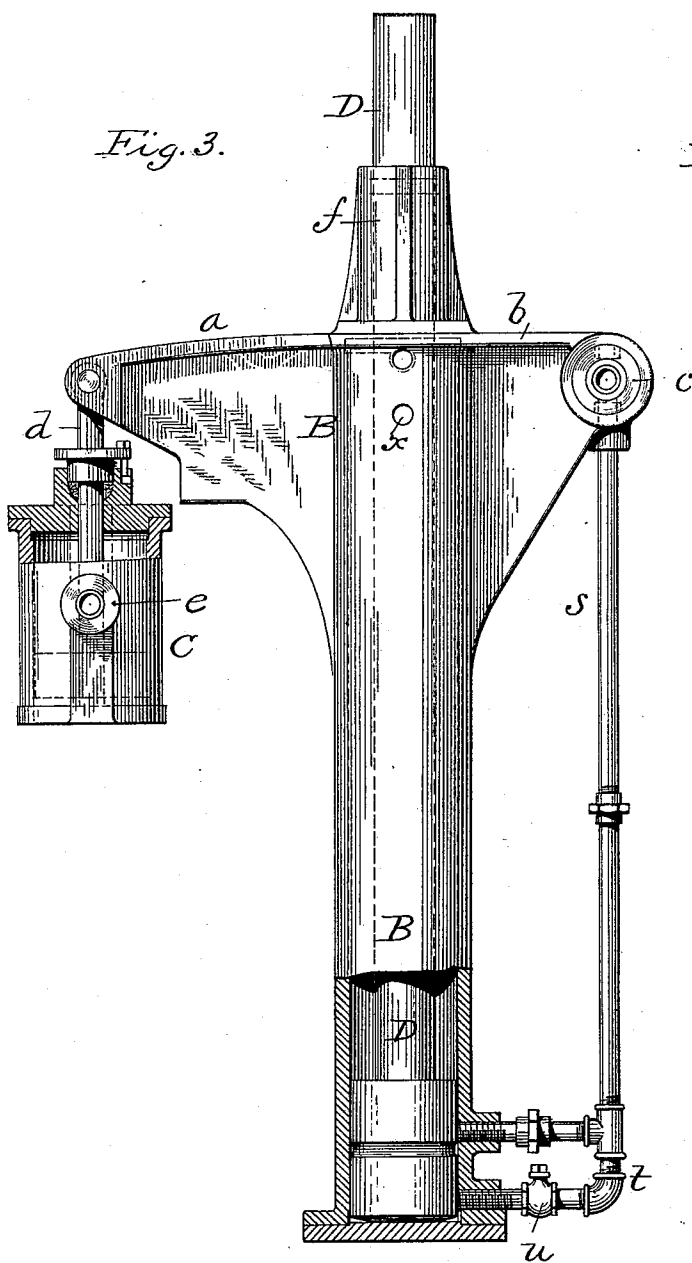
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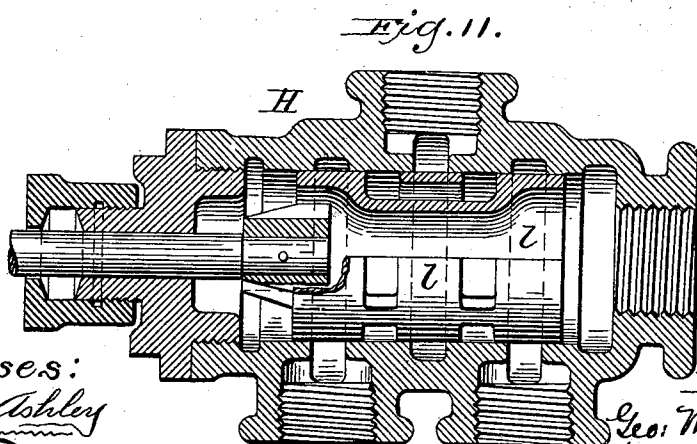
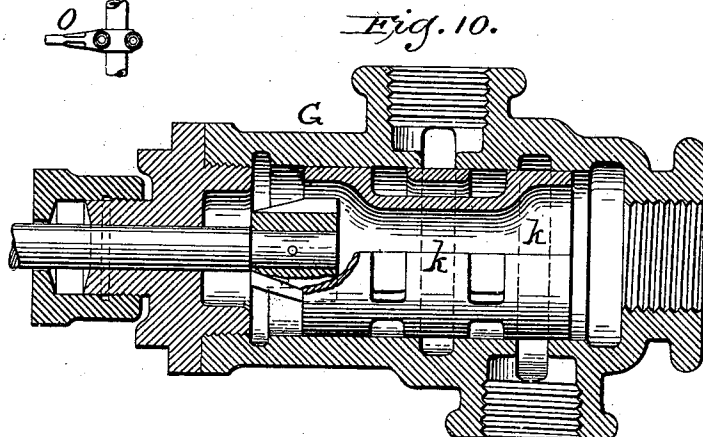
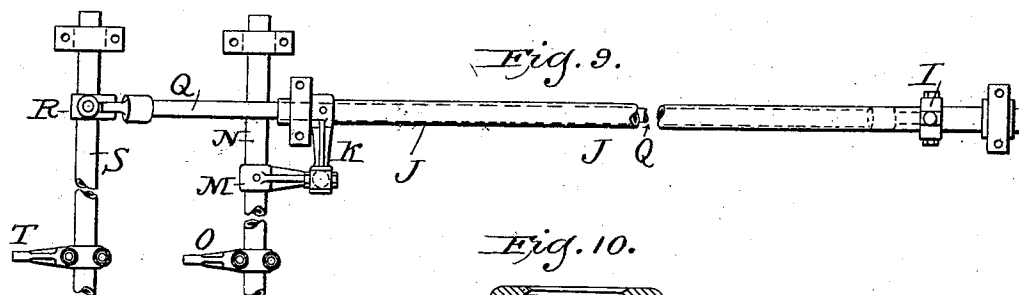
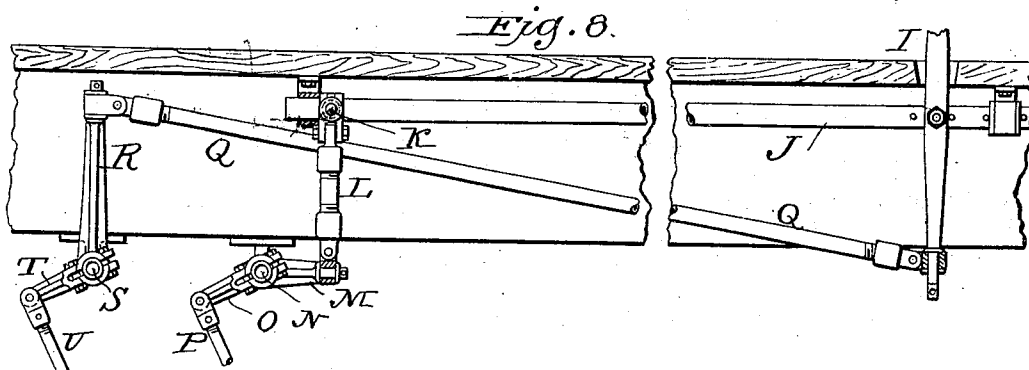
(No Model.)

G. M. HINKLEY.
LOG TURNER.

4 Sheets—Sheet 4.

No. 510,790.

Patented Dec. 12, 1893.



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UNITED STATES PATENT OFFICE.

GEORGE M. HINKLEY, OF MILWAUKEE, WISCONSIN, ASSIGNOR OF ONE-HALF
TO THE EDWARD P. ALLIS COMPANY, OF SAME PLACE.

LOG-TURNER.

SPECIFICATION forming part of Letters Patent No. 510,790, dated December 12, 1893.

Application filed August 17, 1893. Serial No. 483,393. (No model.)

To all whom it may concern:

Be it known that I, GEORGE M. HINKLEY, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Log-Turners, of which the following is a specification.

My invention relates to log turners, and has reference more particularly to that class of devices actuated by a suitable fluid under pressure,—preferably steam.

In the drawings,—Figure 1 is a vertical sectional view through a portion of a saw mill showing the devices in side elevation; Fig. 2, a horizontal sectional view on the line $x-x$ of Fig. 1; Fig. 3, a side elevation of the main cylinder and the tipping chamber, with parts in section; Fig. 4, a rear face view of the main cylinder; Fig. 5, a plan view of the devices shown in Fig. 3; Fig. 6, a perspective view of the yoke connection between the main cylinder and the supporting frame; Fig. 7, a face view of the tipping-cylinder, partly in section; Figs. 8 and 9, views illustrating the construction of the valve-operating mechanism; Fig. 10, a longitudinal sectional view through the valve-casing and valve for the main cylinder; and Fig. 11, a similar view of the valve casing and valve for the tipping or tilting-cylinder.

A indicates a suitable frame or support which may be of most any desired construction, but which in the present instance comprises two heavy metallic plates or frames arranged parallel to each other and suitably connected. This frame will be mounted upon or supported by masonry or timbers,—not shown,—so as to remain rigid and firm.

Between the separated parallel plates of the frame or support A, is mounted the main cylinder B, which latter is provided on its front and rear with horizontal webs or flanges a and b , at its upper end, as shown in Figs. 1, 2, 3, 4, and 5. The rear web b is provided with laterally-extending hollow journals or trunnions c , Figs. 4 and 5, which are mounted in suitable bearings in the frame or support A, and which permit the main cylinder to swing or rock in a vertical plane toward and from the saw mill carriage above. The front flange or web a is connected with the piston rod d

of a piston working within the small cylinder C which effects the tipping or tilting of the main cylinder,—which cylinder C will, in order to distinguish it from the main cylinder, be hereinafter termed the tipping-cylinder. Cylinder C, which is much shorter than cylinder B, is also provided with lateral hollow journals e which are mounted in suitable bearings in the frame A, as shown in Fig. 1,—the said tipping-cylinder being arranged substantially parallel to the main cylinder and in the same framework or support therewith.

The main cylinder is provided with an upward tubular extension f to guide and support the piston rod D, which latter is made nearly one-half the diameter of the cylinder, so as to prevent springing or yielding when the toothed bar E, which is rigidly bolted to the upper end of the piston rod, is reciprocated and comes into contact with the log. Fitting loosely upon the end of the extension f is a cap plate g , whose laterally-extending ears, Fig. 2, are perforated to receive the upper ends of the threaded rods h of the pivoted yoke F shown in Figs. 1 and 6. These rods h , of which there are two, are pivotally connected at their lower ends to a bail i which is hung or pivoted between its ends upon a bolt j extending from side to side of the frame A, as shown in Fig. 2. The front end of this bail i of yoke F bears against the under or lower face of the front web or flange a of the cylinder B, see Fig. 1, and thus not only normally maintains the cylinder B in proper relation to the frame and relieves the tipping-cylinder C and its piston from strain and weight, but also acts as a stop to limit the forward movement of the toothed bar instead of throwing this work upon the tipping cylinder.

Applied to the rear journal or trunnion of the main cylinder is a valve casing G containing a valve k , shown in detail in Fig. 10, while applied to the rear journal of the tipping-cylinder is a valve casing H and valve l , shown in Fig. 11. An exhaust pipe m extends from the casing G, while a similar pipe n extends from the casing H, the two pipes communicating with a common exhaust pipe o , as shown in Fig. 1. As also shown in this figure, a steam supply pipe p is provided with branches

g and *r*, which convey steam to the casings G and H. As steam is supplied only to the lower end of the main cylinder B, a single pipe *s* extends from the lower end of said cylinder up to the hollow journals *c c* to the near one of which the valve casing G is applied, the steam passing to and from the said casing, through the journals, and pipe *s*, to and from the lower end of the cylinder. A short section of pipe *t* connects at one end with the lower end of pipe *s*, and at the opposite end with the cylinder B, and is provided with an inwardly-opening check valve *u*, as shown in Fig. 1.

The valve casing H, Fig. 11, is provided with two steam ports, one of which is connected by a short pipe *v* with the hollow journal *e* of cylinder C, while the other is connected by a pipe *w* with the journal *e* of said cylinder; the said cylinder being adapted to receive steam on both faces of its piston.

As steam is not admitted to the upper end of the main cylinder (owing to the fact that the weight of the toothed bar, piston, and piston rod is sufficient to cause the parts to fall when steam is shut off and allowed to exhaust), I provide the cylinder B with a hole or opening *x*, and also with an inwardly-opening check valve *y*, at its upper end, as shown in Fig. 1.

In order to actuate the valves *k* and *l*, I employ a single hand lever I which straddles and is pivoted to one end of a rockshaft J journaled in suitable bearings upon the under side of the floor of the mill, as shown in Figs. 1, 8 and 9. This rockshaft is provided at its opposite end with a radial arm K, which is connected, by a link L, with an arm M projecting from a short rockshaft N at right angles to shaft J. Shaft N is provided with a second arm O which is connected by a long link or rod P with the stem of valve *k*. From this it will be seen that by merely rocking the lever I laterally, the shafts J and N will also be rocked, and the valve *k* reciprocated longitudinally within its casing. Lever I is extended below shaft J and connected by a bar or rod Q with an arm R projecting from a rockshaft S, Figs. 1, 8 and 9; said rockshaft having a second arm T, which, by means of bar or rod U is connected with the stem of valve *l*. Now, by moving the lever I backward and forward, the shaft S is rocked in its bearings, and, through the connections T U, a reciprocating motion is given to valve *l*.

In order that the lateral or rocking movement of the lever I in actuating valve *k* may not affect the connections for actuating the valve *l*, the bar or rod Q has a swivel connection at its ends with the lever I and arm R respectively. At its upper end, the toothed bar E works within an open casing V which carries a spring-sustained buffer-plate W, as shown in Fig. 1, and which limits the distance the said toothed bar may fall back away from the carriage.

The operation of the device is as follows:

By rocking lever I laterally, the valve *k* will be opened and steam will be admitted into the casing G from which it passes through the hollow journals *c* (closed at one end) and pipe *s* into the lower end of the cylinder B. Steam entering this cylinder, causes its piston to rise and carry with it the toothed bar E, which bar in rising past the carriage turns the log or cant thereon. As the piston rises and closes the hole *x* near the upper end of the cylinder, so much of the air which was above the piston and did not escape through hole *x*, will be caught between the upper face of the piston and the upper end of the cylinder, and, being prevented from escaping through the inwardly-opening check valve *y*, will act as a cushion and prevent injury to the cylinder or piston. After the log has been turned as desired, the movement of the lever I is reversed and the valve *k* moved to a position to connect the exhaust pipe *s* with the exhaust pipe *m*. The piston now begins to fall rapidly, and all the steam that does not escape before the exhaust port or mouth of the exhaust pipe *s* in the lower end of the cylinder B is covered by the piston, is confined between the lower face of the piston and the bottom of the cylinder to act as a cushion, the escape of this body of steam through pipe *t* being prevented by the inwardly-opening check valve *u*.

By placing the pivots or journals of the main cylinder B in rear or back of the center of the latter, the toothed bar will press against the log with sufficient force to act properly. In order, however, to throw the upper end of the toothed bar back away from the carriage for the purpose of getting a log lying upon the deck but near to the carriage, I move the lever I in such direction as to so move the valve *l* as to permit steam to enter beneath the piston within cylinder C. As this piston is connected with the main cylinder, the rising of the piston will effect a rocking tipping, or oscillation of the main cylinder, and the toothed bar.

When the main cylinder has been brought to the desired angular position, steam is admitted to the main cylinder and the toothed bar caused to rise, and after the bar has thus been raised or projected up behind the log, steam is admitted to the top of the tipping-cylinder C, whereupon the main cylinder with its projected bar will be swung over toward the carriage and carry the log with them; the purpose of the tipping-cylinder being to move the toothed bar backward and forward as desired for the purpose of getting a log from the deck, or for pressing it against the carriage knees.

When steam is admitted to the main cylinder, to raise the toothed bar, the lower end of the latter, which encircles the piston rod, is raised up off the cap *g* and the latter being freed from the weight of the bar will rise slightly, owing to the rearward or eccentric pivoting of the main cylinder, and the con-

sequent application of weight or pressure to the front end of bail *i*, thereby allowing the toothed bar to press firmly against the log.

When, however, the bar descends, it will press
5 down upon the cap, and through the rods *h* throw the front end of the bail *i* up against the under side of web or flange *a* of cylinder B; the said bail or lever serving to slightly tip or move the bar and cylinder away from
10 the carriage.

The yoke F may be variously constructed without in any manner departing from my invention; for instance, only one rod *h* need be employed, and the cap *g* omitted; the
15 toothed bar in such case bearing directly upon the upper end of such rod. So too, the bail or lever *i* instead of having two arms, need have but one.

While I have shown the cylinder B as being adapted to receive steam at the upper end only, it is obvious that it may be so connected as to receive steam at both ends.

Having thus described my invention, what I claim is—

25 1. In combination with the main frame; the cylinder B pivoted therein and provided with a piston and a toothed bar; and means for automatically tipping the cylinder forward and backward as the toothed bar ascends and
30 descends.

2. In combination with the main frame; the cylinder B pivoted therein and provided with a piston and a toothed bar; and means substantially such as shown and described, controlled by the toothed bar for effecting an automatic movement of the cylinder toward the log as the toothed bar rises.

3. In combination with the main frame; the cylinder B pivoted therein and provided with
40 a piston and a toothed bar; and means for automatically tipping the cylinder backward when the toothed bar descends.

4. In combination with a suitable frame; a cylinder B journaled therein and provided
45 with a piston and toothed bar; a bail or lever *i* pivoted in the frame and bearing at one end against the cylinder; rods *h h* connected to the opposite end of the bail; and a cap *g*

carried by the cylinder in position to receive the weight of the toothed bar, and connected
50 with the rods *h*.

5. In combination with the main frame; the cylinder B pivoted eccentrically therein and provided with a piston and a toothed bar; and a yoke pivoted in the main frame to sup-
55 port the cylinder on the side opposite the pivots thereof.

6. In combination with the main frame, the cylinder B pivoted therein and provided with a piston and a toothed bar; a yoke pivoted in
60 the main frame and supporting the cylinder on that side opposite the journals of the latter, and acted upon by the weight of the toothed bar, whereby when the toothed bar is raised, the cylinder is permitted to tip
65 slightly.

7. In combination with the main frame; the cylinder B pivoted eccentrically therein and provided with a piston and a toothed bar; an independent tipping-cylinder C pivoted in
70 the main frame substantially parallel with the cylinder B, and having its piston rod connected with the said cylinder B, on that side opposite the pivots of the latter.

8. In combination with the main frame; the
75 cylinder B pivoted therein and provided with a piston and a toothed bar; an independent tipping-cylinder pivoted in the main frame and having its piston rod connected with the cylinder B; and a yoke pivoted in the main
80 frame and adapted to support the cylinder B.

9. In combination with the main frame; the cylinder B provided with a piston and a toothed bar; the flanges *a* and *b* projecting from the front and rear of the cylinder; the
85 journals *c c* projecting from the flange *b*; and the tipping-cylinder C journaled in the main frame and having its piston rod connected with the flange *a*.

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

GEORGE M. HINKLEY

Witnesses:

FRANK W. GREENLEAF,
THEODORE F. WAMBOLD.