(No Model.) 3 Sheets—Sheet 1.

H. G. DITTBENNER.

ENGINE FOR LOG MOVING.

No. 553,229. Patented Jan. 21, 1896.

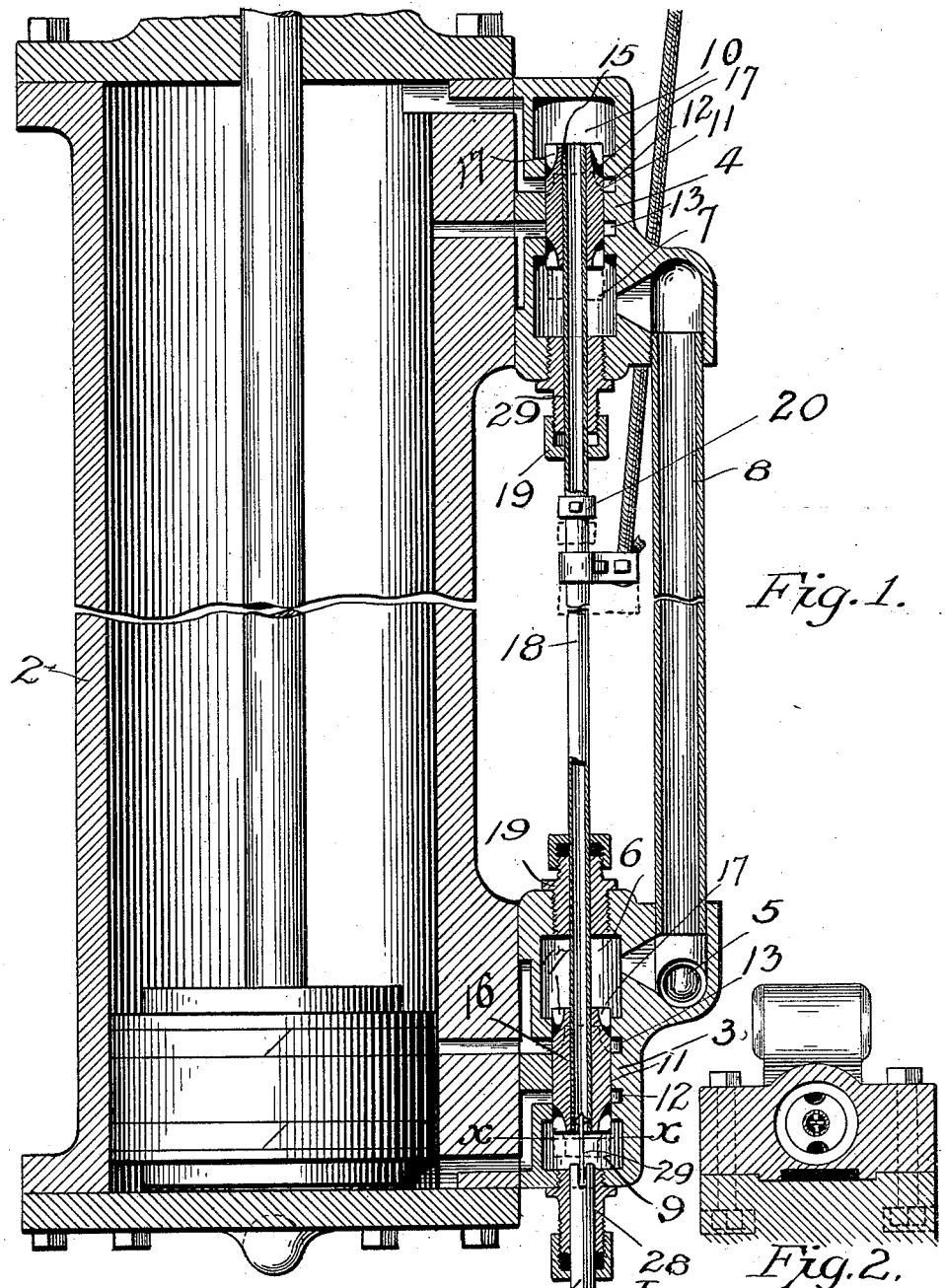

Fig. 1.

Fig. 2.

Witnesses,
Chas. E. Van Dorew,
F. S. Lyon

Inventor,
Hermann G. Dittbenner,
By Paul & Hawley
his Attorneys.

ANDREW B. GRAHAM, PHOTO-LITHO. WASHINGTON, D.C.

(No Model.) 3 Sheets—Sheet 2.

H. G. DITTBENNER.

ENGINE FOR LOG MOVING.

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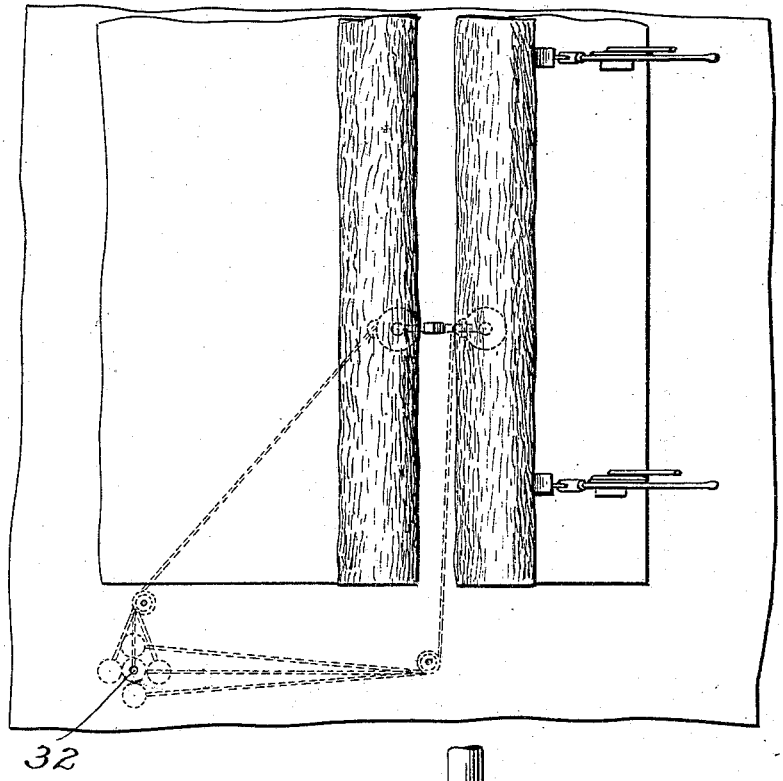

Fig. 4.

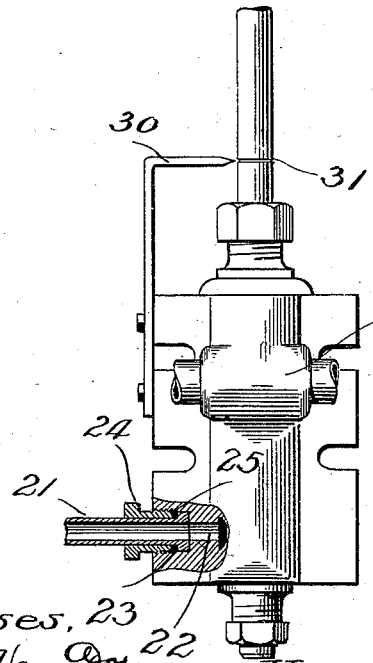

Fig. 3.

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

H. G. DITTBENNER.

ENGINE FOR LOG MOVING.

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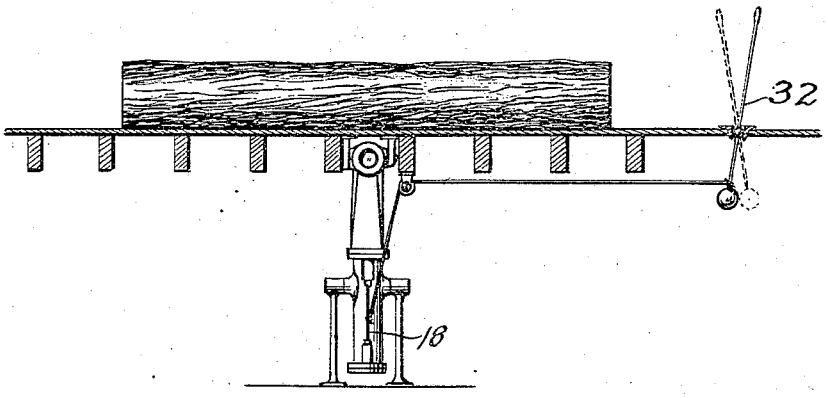

Fig. 5.

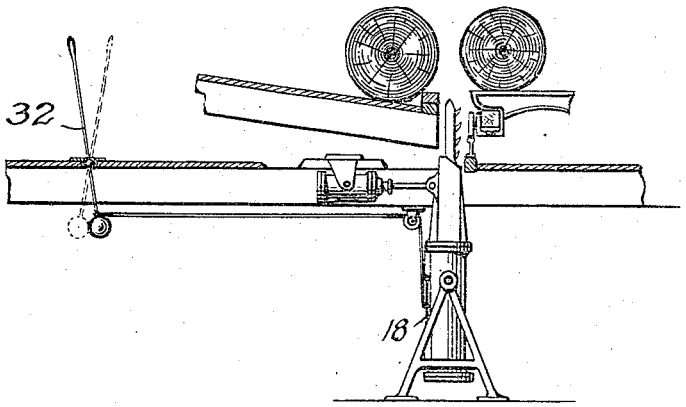

Fig. 6.

Witnesses:
Chas. E. VanDorn.
Frederick S. Lyon

Inventor:
Hermann G. Dittbenner.
By Paul & Hawley
his Attorneys.

UNITED STATES PATENT OFFICE.

HERMANN G. DITTBENNER, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO HENRY H. SMITH AND ALVARADO RICHARDSON, OF SAME PLACE.

ENGINE FOR LOG-MOVING.

SPECIFICATION forming part of Letters Patent No. 553,229, dated January 21, 1896.

Application filed December 11, 1893. Serial No. 493,293. (No model.)

To all whom it may concern:

Be it known that I, HERMANN G. DITTBENNER, of the city of Minneapolis, county of Hennepin, State of Minnesota, have invented a certain new and Improved Engine for Log-Moving, of which the following is a specification.

My invention relates to steam-niggers for sawmills for use in throwing logs from the log-platform to the log-carriage; and my invention relates particularly to improvements in the cylinder-valves and in means for operating and setting the valves.

The object of my invention is to provide means whereby the steam-valves of nigger-cylinders will be automatically returned by steam-pressure after being operated, to provide inexpensive and convenient means for operating the valves, and further to provide means for facilitating the setting of the valves.

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

My invention will be more readily understood by reference to the accompanying drawings, forming part of this specification, and in which—

Figure 1 is a longitudinal section of a steam-nigger cylinder, showing the valve-chests and the valves therein. Fig. 2 is a cross-section on the line *x x* of Fig. 1. Fig. 3 shows the back of one of the valve-chests, a portion thereof being in section. Fig. 4 is a plan diagram showing means for operating the valves.

As shown in the drawings, 2 represents an ordinary steam-nigger or a log-kicker cylinder of the usual construction, and in the main the valve-chests 3 and 4 are of the ordinary construction. The exhaust-pipe 5 leads from the upper end or cavity 6 of the chest 3, and the chest 7 of the upper valve is connected by the pipe 8 with the outgoing exhaust-pipe, which, as shown, is preferably at the lower end near the trunnioned center of the cylinder. The live-steam cavities 9 and 10 are in the outer ends of the steam-chests, the two cavities of each chest being connected by the smooth-bored valve-cylinders 11, having in their walls the inlet or exhaust channels or ports 12 and 13, respectively.

The valve-heads 15 and 16 are adapted to reciprocate in the valve-cylinders and are provided with the longitudinal notches or end grooves 17, as shown, which are moved opposite the ports. These notches decrease in size toward the middle of the valve-head and furnish increased or diminishing inlet or outlet ducts for the steam, preventing any sudden inrush of steam and consequently entirely relieving the whole device of the excessive shocks common in such devices heretofore. These grooves are so arranged that a transverse section taken at any part of the groove will have the same area as the face of the groove exposed.

The two valve-heads are connected by the hollow rod or pipe 18 passing through stuffing-boxes 19 on the cylinder-chests. The movement of the valve rod and heads is preferably limited in its upward stroke by a collar 20 upon the rod or other suitable means. The valve rod or pipe opens through opposite ends of the valve-heads, and the live steam is supplied through the swiveled pipe 21 leading into the lower cavity 9 of the lower steam-chest, passing thence up through the hollow pipe into the upper chest. This pipe 21 is swiveled to allow the cylinder to rock upon its trunnions. The inlet-opening 22 passes clear through the wall of the chest and is enlarged at its outer end to receive the enlarged end 23 of the steam-pipe 21. A bushing 24 is then screwed into the hole, a suitable steam-packing 25 being placed between the end of the bushing and the shoulder on the end of the pipe. In this way the pipe is securely swiveled and at the same time made steam-tight in the wall of the chest.

27 represents a plug adapted to move in the sleeve 28, extending from the end of the lower steam-chest and having the stuffing-box, as shown. This plug is connected by the pivoted link 29 with the lower end of the valve-head, the link preferably extending into the open end of the valve-rod therein. Sufficient space, however, is left for free passage of steam through the valve-rod. The valves are obviously balanced and the weight of the

valves and rod is about supported by the valve-operating mechanism, which is placed upon the overlying floor of the sawmill. Owing to the use of the free plug 27 this balance is destroyed by steam-pressure upon the inner end of the plug, which acts to draw the valve down into the position shown by dotted lines in Fig. 1. The valves are thus automatically returned after being operated, and when so returned the upper steam-port is left open.

To facilitate in setting the valves I provide a pointer 30 upon some part of the cylinder and provide a line or shallow groove 31 upon the valve-rod, the line and pointer being placed so that when opposite the valves will be exactly centered, with respect to the inlet and exhaust ports. In the event of any alteration being necessary the exact movement of the valves may be readily ascertained by these marks.

Heretofore rods and bell-cranks have been employed in connection with the lever for moving the valve-rods, and the employment of these has often been made extremely inconvenient by the positions of floor-beams or approximate machinery, owing to the fact that the rods cannot well be bent to avoid the same. In place of these rods I employ ropes, which may be passed around sheaves wherever required. These ropes are arranged to pull up on the valve-rods, and after being passed around near sheaves are connected with the lower end of the hand-lever 32, as shown in Fig. 4.

By movements in the four directions, as indicated by dotted lines, of the weight-ball upon the lever the ropes may be drawn or loosened to raise or lower the valves of the two cylinders of the steam-nigger and thus cause the proper operation of the pistons thereof.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with the cylinder, of the valve chest upon opposite ends thereof, the valves in said chest, the valve rod connecting the same, the sleeve in the end of one of said chests, and the free plug provided in said chest and connected with the adjacent valve head, whereby steam pressure exerted upon the end of the plug actuates the automatic return of the valves.

2. The combination, with the cylinder and its valve chests, of the valves therein, the rod connecting the valve heads, the open sleeve upon the end of one of said chests, the free plug adapted to move in said sleeve and in line with the valve heads, and the pivotal link connecting said plug with the valve head, said sleeve extending from the live steam cavity of said chest, substantially as described.

3. The combination, with the two cylinders, of a steam nigger, of the valves thereof, the operating lever 32 universally pivoted, and the valve ropes extending from said lever or oppositely placed sheaves to connections with the valve rods of said cylinders, whereby said valves may be operated by a single lever, substantially as described.

4. The combination, with the cylinder having the port grooves, of the valve chest upon opposite ends thereof, the valves in said chest, the valve rod connecting the same, the sleeve in the end of one of said chests, the free plug in said chest and connected to the adjacent valve head, and said valve heads being provided with longitudinally diminishing grooves adapted to lap over said port grooves when the head is moved, for the purpose set forth.

5. The combination, with the cylinder of the valve chest upon opposite ends thereof, the exhaust pipe provided in one of said chests, the pipe 8 connecting said exhaust pipe with the opposite valve chest, the valve in said chests, the rod 18 connecting said valve heads, the collar for limiting the movement thereof, the sleeve provided in one of said chests, the plug arranged to move in said sleeve, and the link connecting said plug and the adjacent valve head, for the purpose set forth.

In testimony whereof I have hereunto set my hand, at Minneapolis, Minnesota, this 14th day of November, 1893.

HERMANN G. DITTBENNER.

In presence of—

C. G. HAWLEY,

FREDRIK S. LYON.