

No. 708,598.

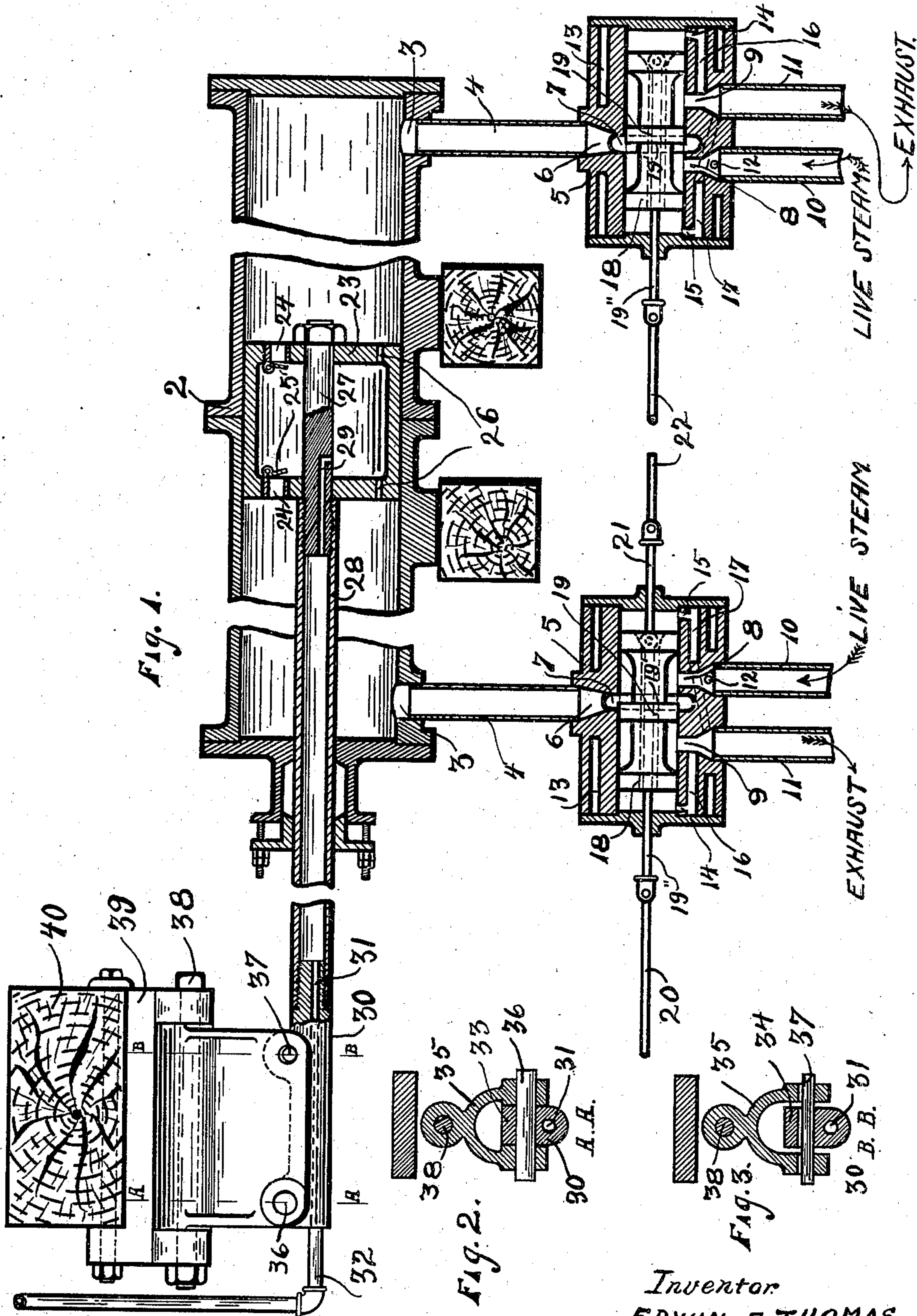
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STEAM FEED FOR SAWMILL CARRIAGES.

(Application filed Aug. 31, 1901.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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STEAM-FEED FOR SAWMILL-CARRIAGES.

SPECIFICATION forming part of Letters Patent No. 708,598, dated September 9, 1902.

Application filed August 31, 1901. Serial No. 73,914. (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 Steam-Feeds for Sawmill-Carriages, of which the following is a specification.

The invention relates to improvements in sawmill machinery, and particularly in the mechanism employed for operating the log-carriage.

The object of the invention is to provide means whereby the full power or pressure of the steam will be instantly exerted on the cylinder-piston, to the end that quicker action of the carriage may be had than by the apparatus heretofore employed.

A further object of the invention is to provide means for maintaining a constant pressure of steam at the carriage for operating the mechanism thereon when the piston and carriage are stationary.

A further object is to reduce the volume of water of condensation in the cylinder.

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

The invention consists generally in a log-carriage cylinder and piston provided with means for simultaneously admitting steam to both sides of the piston and alternately exhausting therefrom.

Further, the invention consists in improved means for conveying the live steam from the cylinder to the log-carriage and maintaining a constant pressure at that point.

Further, the invention consists in improved valve devices whereby the passage of the steam to the cylinder is controlled.

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 longitudinal section of a log-carriage cylinder and its valves and showing the method of connecting the piston-rod to the log-carriage. Fig. 2 is a sectional view on the line A A of Fig. 1. Fig. 3 is a similar view on line B B of Fig. 1.

In the drawings, 2 represents a log-carriage

cylinder, having near each end the usual steam-inlet ports 3, to which pipes 4 are connected.

5 represents valve-casings having centrally-arranged ports 6, that are connected to the lower ends of the pipes 4. The valve-casings are provided in their interior walls with annular grooves 7, communicating with the ports 6 and located between steam inlet and exhaust ports 8 and 9, that are connected, respectively, with live-steam and exhaust pipes 10 and 11. The ports 8 are provided in the walls of the casings with ducts 12, communicating with steam-chambers 13, that inclose the central portion of the valve-casings and form steam-jackets therefor to equalize the expansion and prevent sticking of the valves. The valve-casings are provided at each end with small ducts 14 and 15, through which the water of condensation flows into passages 16 and 17, the former communicating directly with the exhaust ports and pipes and the latter leading into passages that are indicated by dotted lines in the figures and extend around the steam-inlet ports and ultimately connect with the exhaust-ports. This manner of disposing of the water of condensation I regard as a very simple one and particularly applicable to devices of this kind.

Within the valve-casings I provide double-ended D-valves 18, having bridges 19, that alternately cut off the passage of steam from the inlet-ports to the cylinder and from the cylinder to the exhaust-ports. These valves operate simultaneously and are balanced in their normal position stand with their bridges shutting off the passages to the exhaust-ports and allowing the steam to flow directly into the cylinder on both sides of the piston. The bridges have flat faces 19', so that when the steam is exhausted from the cylinder it will pass by these faces without disturbing the balance of the valves. The valves are provided with piston-rods 19'', that preferably extend through them from one end to another, and as said valves are arranged in tandem I connect the piston of the forward one to the sawyer's lever by a rod 20 and the rear end of the forward valve to the piston of the rear valve by a link 21 and a rod 22.

In mechanisms of this kind as ordinarily constructed the steam is shut off from the cylinder when the carriage is not in operation, and to set the machinery in motion the sawyer
 5 allows steam to flow into the cylinder on one side of the piston to move it in one direction and then exhausts the steam from that side and lets it flow into the other side to move the piston in the opposite direction. As the
 10 steam necessarily flows through several pipes and valves before reaching the cylinder, its pressure is somewhat reduced and the full power or force of the boiler-pressure is not exerted on the piston, and, furthermore, a
 15 little time is lost in raising the cylinder to the required pressure after each exhaust. With my improved construction, however, where substantially full boiler-pressure is normally on both sides of the piston I am able to in-
 20 stantly utilize the full force of the steam and at the same time obtain a quicker action of the piston than by the method heretofore employed. The carriage being at rest and substantially the full boiler-pressure being on
 25 each side of the piston, if it is desired to move the carriage the sawyer operates the valves and opens the exhaust at one end of the cylinder. The pressure at that end is immediately reduced, and the instant it falls below
 30 that of the other end the piston will be set in motion.

Any form of piston may be used with the mechanism heretofore described; but as this apparatus is particularly adapted for use with
 35 a cylinder provided with means for conducting the steam to the log-carriage I prefer to employ a piston such as is shown indicated by the reference-figure 23. This piston is hollow, having in its upper side steam-inlet
 40 openings 24, covered on the inside by inwardly-opening check-valves 25. When the piston is moving in one direction, the valve at one end will be opened to admit steam into the piston and the valve at the opposite end will
 45 be closed. Movement of the piston in the opposite direction will reverse the operation of the valves. Near the lower side the piston is provided with small ducts 26, through which the water of condensation flows out of the piston into the cylinder. The piston is provided
 50 with a plug 27, extending therethrough and having a threaded end, to which one end of a hollow piston-rod 28 is connected. A small duct 29 communicates through the plug 27 with
 55 the interior of the piston and with the hollow piston-rod. The other end of the piston-rod is connected to the threaded end of the plug 30, that is provided with a central duct 31, communicating with the piston-rod, and with a
 60 pipe 32, that extends up to the log-carriage and supplies steam for the purpose of operating steam set-works, log-turning devices, or any other power-operated mechanism that may be located on the carriage. The plug 30
 65 is provided with lugs 33 and 34, the former being hinged to the forks of a bracket 35 by means of a snugly-fitting drive-pin 36, and

said lug 33 fits snugly between the forks of said bracket. The other lug is narrower than the space between said forks and is supported
 70 therein upon a pin 37, that fits loosely within holes in said fork and said lug. The bracket 35 is supported upon a bolt 38, passing through lugs of a hanger 39, that is bolted to a cross-
 75 timber 40 on the log-carriage. It will be evident that steam being admitted to the hollow piston will flow through the duct 29 and the hollow piston-rod up through the pipe 32 to the log-carriage, and it will also be evident
 80 that as steam is always on both ends of the cylinder when the carriage is not in motion substantially the same pressure will be had at all times on the log-carriage, so that the mechanism thereon may be operated for any
 85 purpose by power without the operation of the sawyer's lever or the slide-valves or movement of the cylinder-piston. This feature of my invention I regard as very important, as it permits operation of the log-carriage-power mechanism independently of the
 90 cylinder-piston, which has not been possible in mechanisms of this kind as usually constructed, as the steam was off the cylinder when the carriage was not running, and it was necessary to set the machinery in motion
 95 and operate the cylinder-piston in order to have steam to use for the set-works or log-turning devices or whatever appliances were operated by power on the carriage.

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

1. The combination, with a log-carriage steam-cylinder and piston having its rod connected with the carriage, of valve-casings hav-
 105 ing suitable pipe connections with the ends of the cylinder and with the steam-supply and normally admitting steam to both sides of the piston simultaneously, and suitable slide-valves provided in said casings and within
 110 control of the sawyer and when stationary allowing steam to enter both ends of the cylinder simultaneously and when operated alternately closing the steam-inlet passages and opening the cylinder to the exhausts, sub-
 115 stantially as described.

2. The combination, with a log-carriage steam-cylinder and piston having its rod connected with the carriage, of valve-casings having suitable pipe connections with the
 120 cylinder on both sides of the piston and provided with steam inlet and exhaust ports and with annular grooves between said inlet and exhaust ports communicating with the cylinder, and slide-valves provided in said cas-
 125 ings and within control of the sawyer for normally allowing the steam to flow into both ends of the cylinder simultaneously when the carriage is stationary and alternately exhausting the steam from each side of the pis-
 130 ton when the carriage is in motion.

3. The combination, with a log-carriage steam-cylinder and its piston connected with the log-carriage, of valve-casings connected

respectively with the cylinder on both sides of the piston, said casings being provided with steam inlet and exhaust ports and having annular grooves located between said ports and forming passages communicating with the cylinder, piston-valves provided in said casings and within the control of the sawyer, and bridges provided on said valves intermediate to their ends for closing the exhausts when the valves are stationary and opening the steam-inlet passages to the cylinder, and alternately opening and closing said exhausts and said inlet-ports when the valves are in motion.

4. The combination, with a log-carriage steam-cylinder and its piston connected with the log-carriage, of valve-casings having pipe connections with the cylinder on each side of the piston respectively, said casings having steam inlet and exhaust ports, annular grooves provided in the walls of said casings between said ports and communicating with the cylinder, piston-valves provided in said casings and within control of the sawyer, bridges provided on said valves intermediate to their ends and permitting steam to flow into the cylinder upon both sides of the piston when the valves are stationary and alternately exhausting the steam from the ends of the cylinder when the valves are in motion, the sides of the bridges being substantially flat, for the purpose specified.

5. The combination, with a valve-casing having inlet and exhaust ports and a suitable connection with a cylinder, of a piston-valve provided within said casing, ducts for the water of condensation provided in the wall of said casing near its ends, and passages connecting said ducts with the exhaust port.

6. The combination, with a cylinder, of a valve-casing connected therewith and provided with inlet and exhaust ports and an annular duct between said ports, of a double-ended slide-valve provided within said casing and having a bridge intermediate to its ends for closing the passages from said ports to said duct and the cylinder, and ducts for the water of condensation provided near the ends of said casing and communicating with passages that lead to the exhaust, substantially as described and for the purpose specified.

7. The combination, with a log-carriage steam-cylinder and its piston connected with the carriage, of suitable means through which live steam is conducted from the cylinder to the carriage, and means for delivering steam simultaneously to both ends of the cylinder when the carriage is at rest, whereby the pressure on the carriage is always constant, and means within control of the sawyer for alternately closing the live-steam inlets and opening said cylinder ends to the exhausts, substantially as described.

8. The combination, with a log-carriage steam-cylinder, of a hollow piston therein provided with check-valves, a hollow piston-rod

provided with suitable ducts through which steam is conveyed to the log-carriage, suitable operative connections provided between said piston-rod and carriage, means through which steam is normally admitted to both sides of the piston simultaneously, whereby the pressure on the carriage is constant even when the carriage is stationary, and means within control of the sawyer for alternately shutting off the admission of steam to the ends of the cylinder and opening the same to the exhausts, substantially as described.

9. The combination, with a log-carriage steam-cylinder having a hollow piston provided with check-valves and a piston-rod connected with a log-carriage and provided with ducts through which steam is conveyed to the carriage, of valve-casings having pipe connections with the cylinder on both sides of the piston and provided with steam inlet and exhaust ports, and slide-valves provided within said casings and within control of the sawyer, and provided with means for normally allowing the steam to enter on both sides of the piston simultaneously when the valves are stationary and for alternately exhausting the steam from said sides when the valves are in motion, substantially as described.

10. The combination, with a log-carriage steam-cylinder, of a hollow piston therein provided with check-valves and ducts for the water of condensation, a plug provided in said piston, a second plug having suitable connections with the log-carriage, a hollow piston-rod connecting said plugs, suitable ducts provided in said plugs connecting said rod with the hollow piston and with pipe connections to the carriage, means through which steam is delivered simultaneously to both sides of the piston when the carriage is stationary, whereby pressure on the log-carriage will be constant, and means within control of the sawyer for alternately shutting off the passage of steam to each side of the piston and opening the same to the exhaust, substantially as described.

11. The combination, with a log-carriage steam-cylinder, of a piston having a hollow rod connected with the carriage and through which rod steam is conducted from both ends of the cylinder to the steam-operated mechanism on the carriage, means for delivering steam simultaneously to both ends of the cylinder when the carriage is at rest, whereby pressure on the carriage mechanism is always constant, and means within control of the sawyer for alternately shutting off the steam from the ends of the cylinder and opening them to the exhausts.

In testimony whereof I have hereunto set my hand this 27th day of August, 1901, at Minneapolis, Minnesota.

EDWIN E. THOMAS.

In presence of—

RICHARD PAUL,
M. E. GOOLEY.