

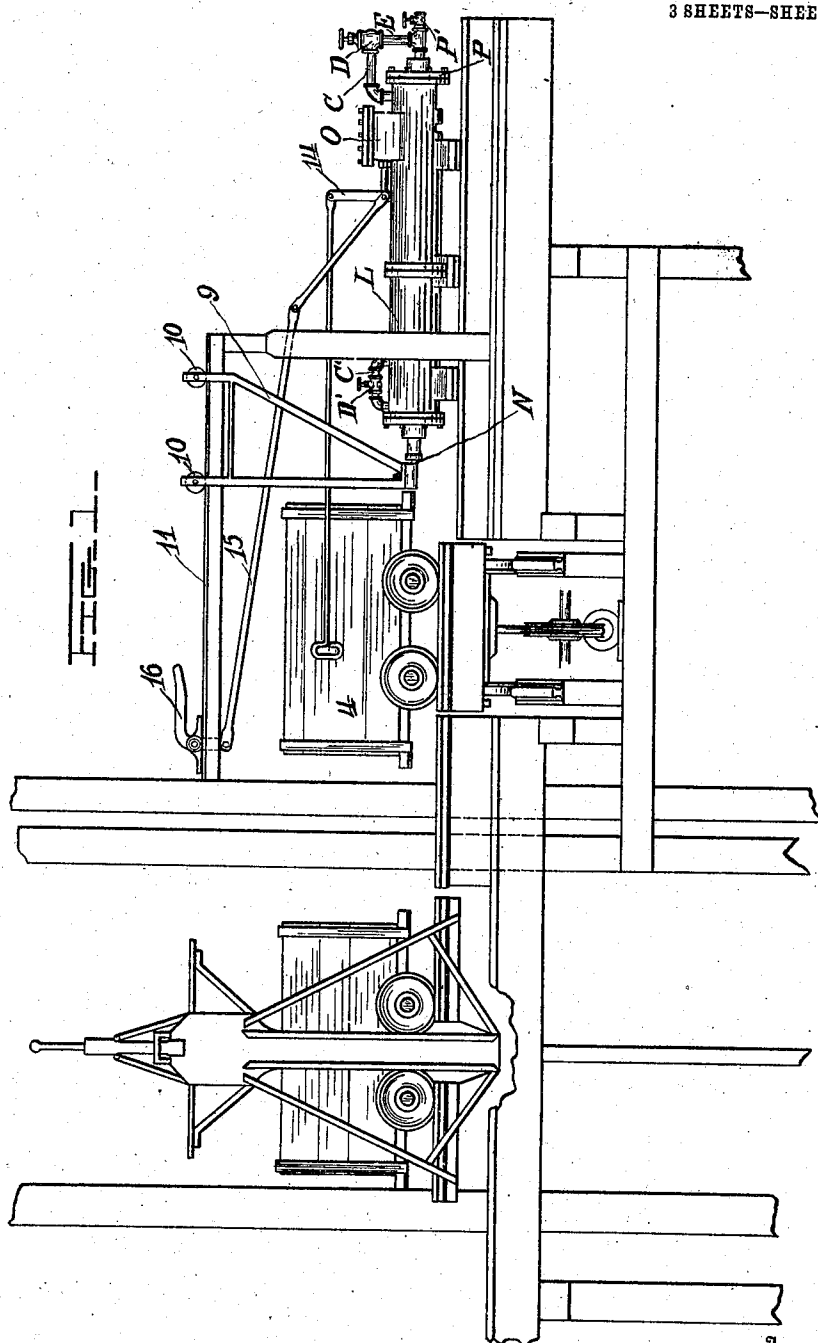
No. 847,950.

PATENTED MAR. 19, 1907.

F. I. KIMBALL.
APPARATUS FOR SHIFTING CARS.

APPLICATION FILED SEPT. 20, 1906.

3 SHEETS—SHEET 1.



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A. A. Hammond.

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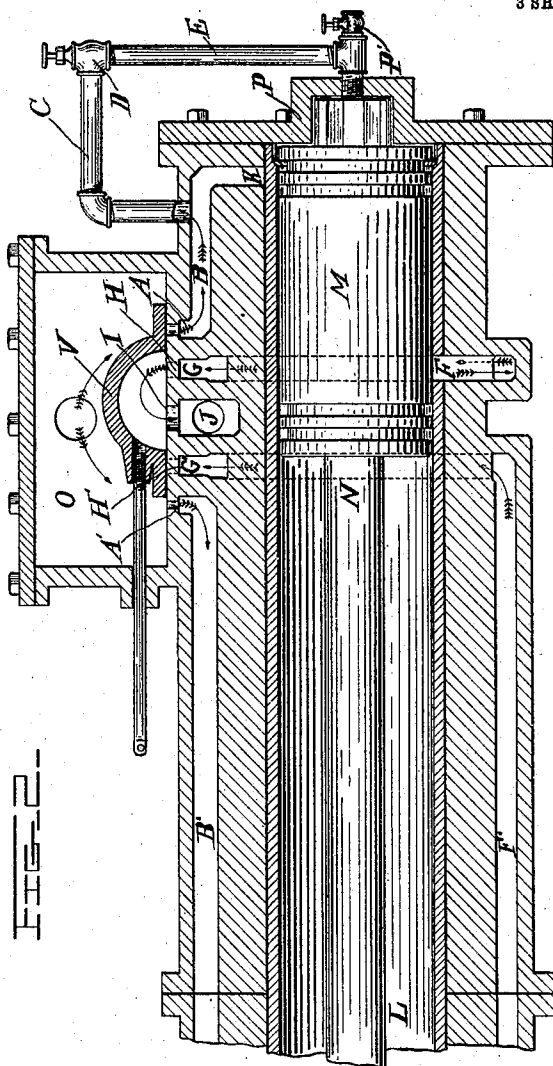
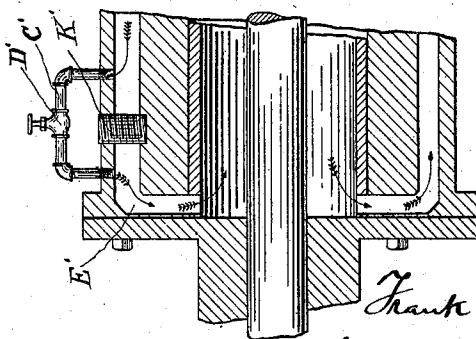


FIG. 2.



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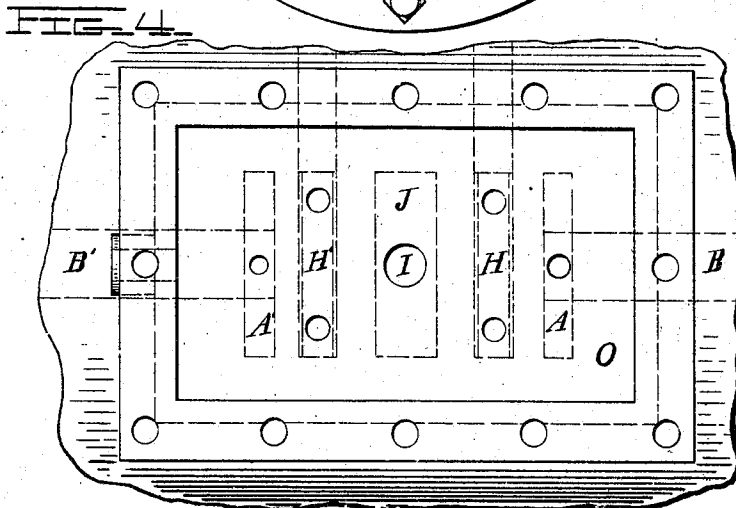
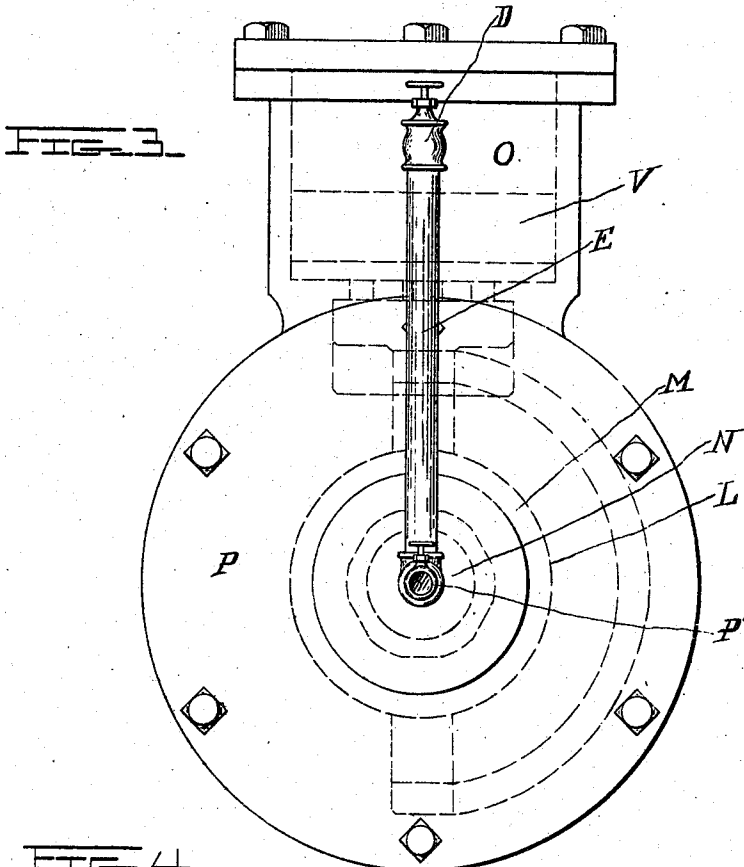
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

FRANK I. KIMBALL, OF HERMINIE, PENNSYLVANIA.

APPARATUS FOR SHIFTING CARS.

No. 847,950.

Specification of Letters Patent.

Patented March 19, 1907.

Application filed September 20, 1906. Serial No. 335,449.

To all whom it may concern:

Be it known that I, FRANK I. KIMBALL, a citizen of the United States, residing at Herminie, in the county of Westmoreland and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Shifting Cars, of which the following is a specification.

My invention relates to an improvement in apparatus for shifting cars, and has to do more particularly with the mechanism disclosed in the Ramsay patent, No. 404,656, June 4, 1889.

In the patented machine the live steam passes into and the exhaust-steam out from the cylinder through the same ports, with the result that the exhaust-steam blows out nearly all of the oil, so that the ordinary sight-feed lubricator does not afford adequate lubrication. In the machine referred to there is no efficient regulation of the steam during the return stroke—that is to say, a fixed opening is provided in the check-valve of an automatic nature and not under the control of the operator, which results in a variable speed dependent upon the pressure and dryness of the steam and temperature of the cylinder. Likewise upon the completion of the return stroke no adequate cushion is afforded to keep the piston from striking the cylinder-head.

The object of the present invention is to obviate these deficiencies, first, by the introduction of separate ports for the steam to pass into and out of the cylinder, so that the direction in which the steam travels is not reversed, thereby carrying the oil along with the steam; second, the introduction of a regulating-valve in the live-steam passage at a point between the slide-valve and the piston, so that the speed of the latter can be regulated without disturbing the slide-valve; this regulating-valve must be adjustable from the outside and conveniently arranged and located so that the operator can change the speed of the machine instantly and at will; third, the introduction of a similar valve in a pipe or by-pass leading from the steam-chest to the forward end of the machine to regulate the speed of the forward or outward stroke, which regulating-valve must be placed between the slide-valve and the piston-exhaust; if placed between the slide-valve and the boiler, as in the original machine referred to, there will not be suffi-

cient pressure on top of the slide-valve to hold the steam-cushion in the cylinder, thus preventing the slide-valve from lifting and letting the cushion out, and, fourth, the introduction of separate ports for steam and exhaust, so that on the return stroke the piston is cushioned upon the steam shut into the end of the cylinder by the piston passing over and closing the exhaust-port, the piston being made long enough, contrary to the usual practice, to entirely cover the exhaust-port during the travel of the piston into the cushion.

Still another defect in the present machines resides in the fact that the main steam-valve has no lap, so that the pressure is always on one end of the cylinder, causing unnecessary strain on the packing and loss from radiation of heat when the machine is not working. I propose, if practicable, in the present construction to introduce a D or Myers valve with the lap arrangement of seat and ports having a sufficient lap to shut the steam out of the cylinder when the machine is not working.

With the foregoing objects in view my present invention consists in certain novel features of construction and combinations of parts, which will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of the apparatus, showing my improvements applied thereto. Fig. 2 is an enlarged section through the cylinder. Fig. 3 is an end view of the same. Fig. 4 is a view looking down on the valve-chest, the ports being indicated by dotted lines.

In the cylinder L the piston M is fitted, and this piston has a piston-rod N, which extends out through the outer end of the cylinder in position to push the car 4, as hitherto. A valve-chest O is located over the cylinder, as shown, and this chest is provided with the live-steam orifices A and A' at its opposite ends, which communicate with live-steam ports or pipes B and B', respectively, which later lead to the opposite ends of the cylinder. Orifices H and H' form the outlets of the exhaust ports or pipes F G and F' G', leading from the opposite ends of the cylinder and discharging into the main exhaust I J. The piston M must be of sufficient length to cover the exhaust-port F when the piston is against the head P, as otherwise the steam which is pushed by the piston toward the head P would escape through port F, and the

piston preferably has a double set of rings at each end to make it fit the bore of the cylinder steam-tight.

A by-pass C leads from the live-steam port B into the inner end of the cylinder L at E, and this by-pass is controlled by the regulating-valve D by the operator. A similar by-pass C' at the opposite end of the cylinder connects the live-steam port by passing the steam in the live-steam port B' around the plug K, and this by-pass is provided with a regulating-valve D', which is under the control of the operator. The exhaust-ports F G and F' G' may be cast on the outside of the cylinder, or in some machines piping may be used instead.

The main slide-valve is opened by the engineer in order to start the operation of the machine, and the piston is preferably reversed automatically when it reaches the outer end of its stroke by the same or similar mechanism to that disclosed in the Ramsay patent and which is illustrated in Fig. 1, a frame 9 being carried forward by the piston-rod N. This frame is mounted on wheels 10, which travel on the elevated track 11, so that when the frame 9 has been carried forward nearly to the end of its stroke the wheels 10 pass under an arm 16, which is connected by a rod 15 to a lever 14, which is connected with the slide-valve, and the lifting of this arm 16 reverses the slide-valve automatically. The valve is reversed just before the piston M completes its stroke, so as to maintain a cushion of steam in the outer end of the cylinder, and thereby prevent injury to the piston or cylinder-head.

The operation is briefly as follows: As shown in Fig. 2, the piston M is at the end of the return stroke, the piston-rod N being drawn back into the cylinder L. In order to start the machine, the slide-valve V is drawn forward by hand to the left end of valve-chest O. Steam being admitted to the orifice A and the right steam-port B, the steam passes down into the port B and thence through pipe C, passing the regulating-valve D and through opening E into the rear end of the cylinder L. The pressure on the piston M forces the latter and its rod forward, pushing the car 4 which is in front of it, as in the Ramsay patent. When the car is pushed far enough, the slide-valve is automatically reversed, as previously explained, and live steam admitted through the orifice A' into the port B', the same movement of the valve-closing orifice A, orifice H', exhaust-port F' G' and opens the orifice H into main exhaust I J, permitting the steam in the inner end of the cylinder to exhaust through exhaust-port F G. The live steam passes through orifice A' into the port B', thence through by-pass C' passes the regulating-valve D' through the outlet E' into the outer end of the cylinder L. The piston M is

forced back by the steam-pressure toward the position shown in Fig. 2 of the drawing. The exhaust-port F G, orifice H, and main exhaust-port I J are now all open, the exhaust-steam passing freely out and into the open air, while the port F' G' and orifice H' are closed by the valve at H'. As soon as the piston M passes over the exhaust-port F G the steam which is contained in the inner end of the cylinder between this exhaust-port and the cylinder-head P is shut in and forms a cushion to stop the piston M. It will be observed that the piston M must be long enough to cover port F G when the piston is against the head P, or else the steam which is pushing the piston M from the other end would escape through port F G. A small opening in the head P, controlled by a small regulating-valve P', allows the cushion and any steam which may leak through the valve D to slowly escape, as otherwise the piston M would "chatter"—that is to say, rebound on the cushion and be again forced against the cushion by the live steam on the other side of the piston. The piston is now ready for another forward stroke. The valve is again moved to the right by hand, opening orifice A, closing orifice H to the main exhaust-port I J, opening orifice H' and the main exhaust-port I J, and closing orifice A'. The piston M is again forced forward, and steam passes out through ports F' G' and orifice H' to the main exhaust I J to the open air. In this way a most efficient apparatus is provided entirely obviating the objections hitherto present in apparatus of this character, while subjecting the entire control of the stroke in both directions to the will of the engineer in control.

While the apparatus has been described as adapted for steam, it is evident that pneumatic pressure might be used or possibly hydraulic pressure.

It is also evident that slight changes might be resorted to in the form and arrangement of the several parts described without departing from the spirit and scope of my invention, and hence I do not wish to limit myself to the exact construction herein set forth; but,

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

1. The combination with a cylinder, piston, steam-chest and valve therein, said steam-chest having an orifice, and independent live and exhaust steam ports extending from opposite ends of the cylinder to the orifices in the steam-chest, said live-steam ports each having by-passes, each by-pass having a valve therein and a valve to permit the steam cushioning medium in the end of the cylinder to slowly escape.

2. The combination with a cylinder, piston, steam-chest and valve therein, said

steam-chest having orifices, and independent live and exhaust steam ports extending from opposite ends of the cylinder to the orifices in the steam-chest one of the exhaust-ports 5 leading from the extreme end of the cylinder and the other leading from the cylinder at a point an appreciable distance from the end of the cylinder, and a valve for bleeding this end of the cylinder of means within the control of the operator independent of the main 10 slide-valve for controlling the amount of live steam discharging into the ends of the cylinder.

3. The combination with a cylinder, piston, steam-chest and valve, of live-steam 15 ports leading from the steam-chest to the opposite ends of the cylinder and independent exhaust-ports leading from opposite ends of the cylinder to the steam-chest, one exhaust- 20 port located at the extreme end of the cylinder and the other an appreciable distance

from the end of the cylinder and the piston being of greater length than the distance between this latter exhaust-port and the end of the cylinder whereby the exhaust is closed by 25 the piston in order to trap steam into the end of the cylinder to form a cushion.

4. The combination with a cylinder, piston, steam-chest, valve, live and exhaust ports, of a by-pass, discharging into the extreme end of the cylinder, a regulating-valve 30 therein and a valve to permit the steam cushioning medium in the end of the cylinder to slowly escape.

In testimony whereof I have signed my 35 name to this specification in the presence of two subscribing witnesses.

FRANK I. KIMBALL.

Witnesses:

HARRY McCUNE,
ALBERTA WANAMAKER.