No. 813,214. PATENTED FEB. 20, 1906.

J. F. JOY.

LUBRICATOR FOR CARS.

APPLICATION FILED APR. 17, 1905.

2 SHEETS—SHEET 1.

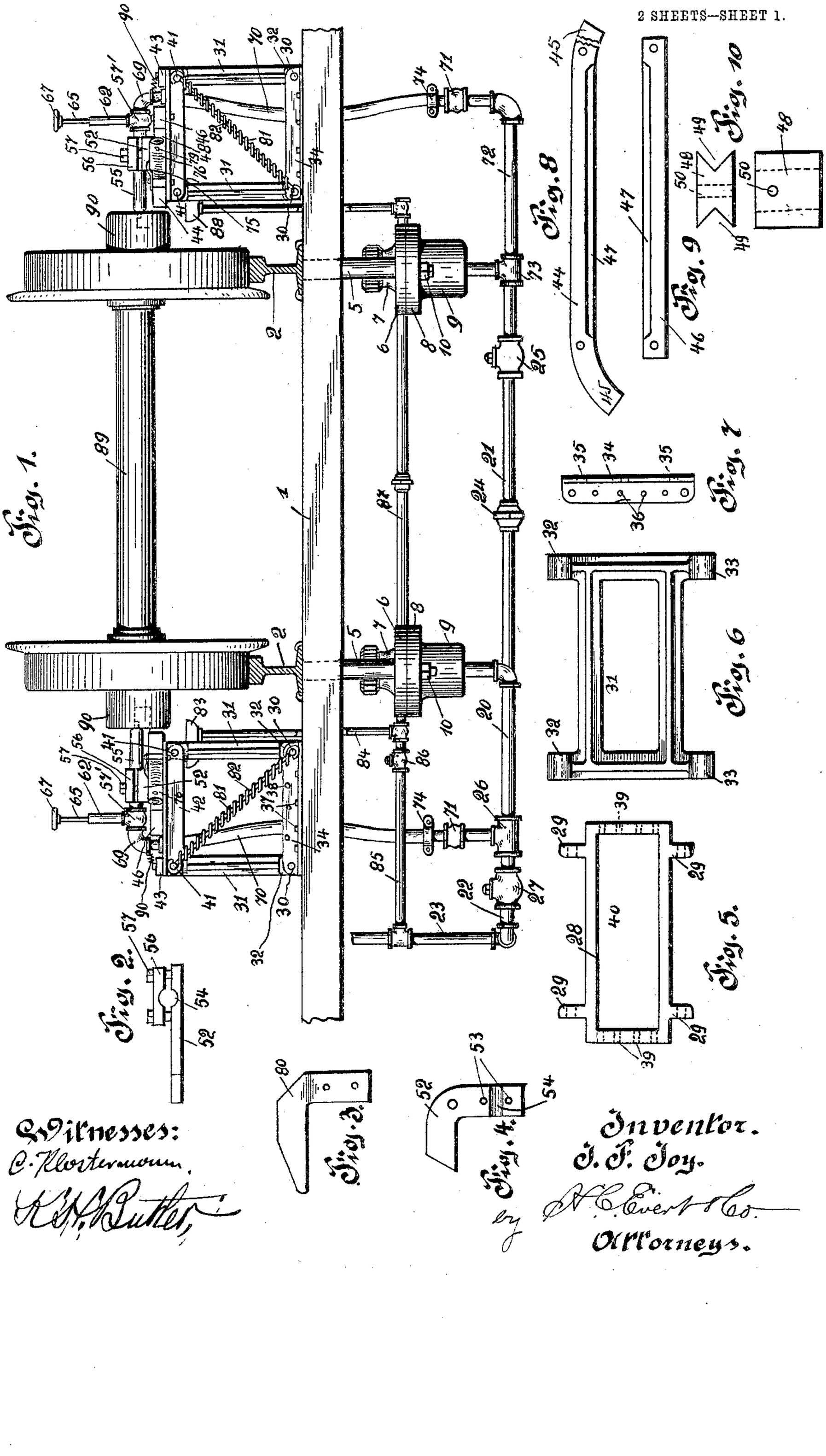

Fig. 1.



Fig. 2.



Fig. 3.



Fig. 4.



Fig. 5.



Fig. 6.



Fig. 7.



Fig. 8.



Fig. 9.



Fig. 10.

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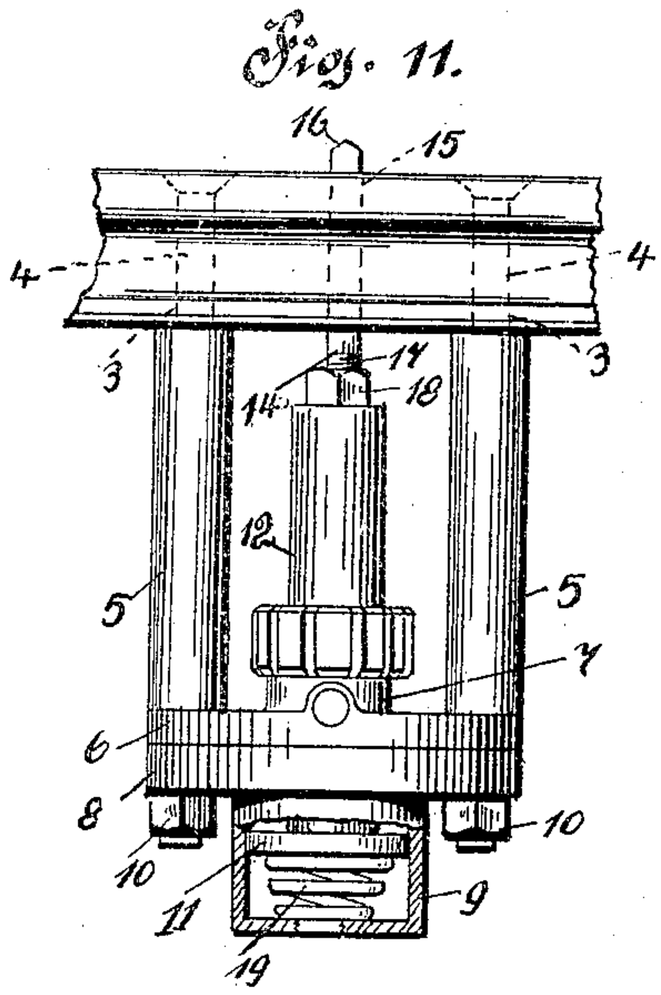
2 SHEETS—SHEET 2.

Fig. 11.



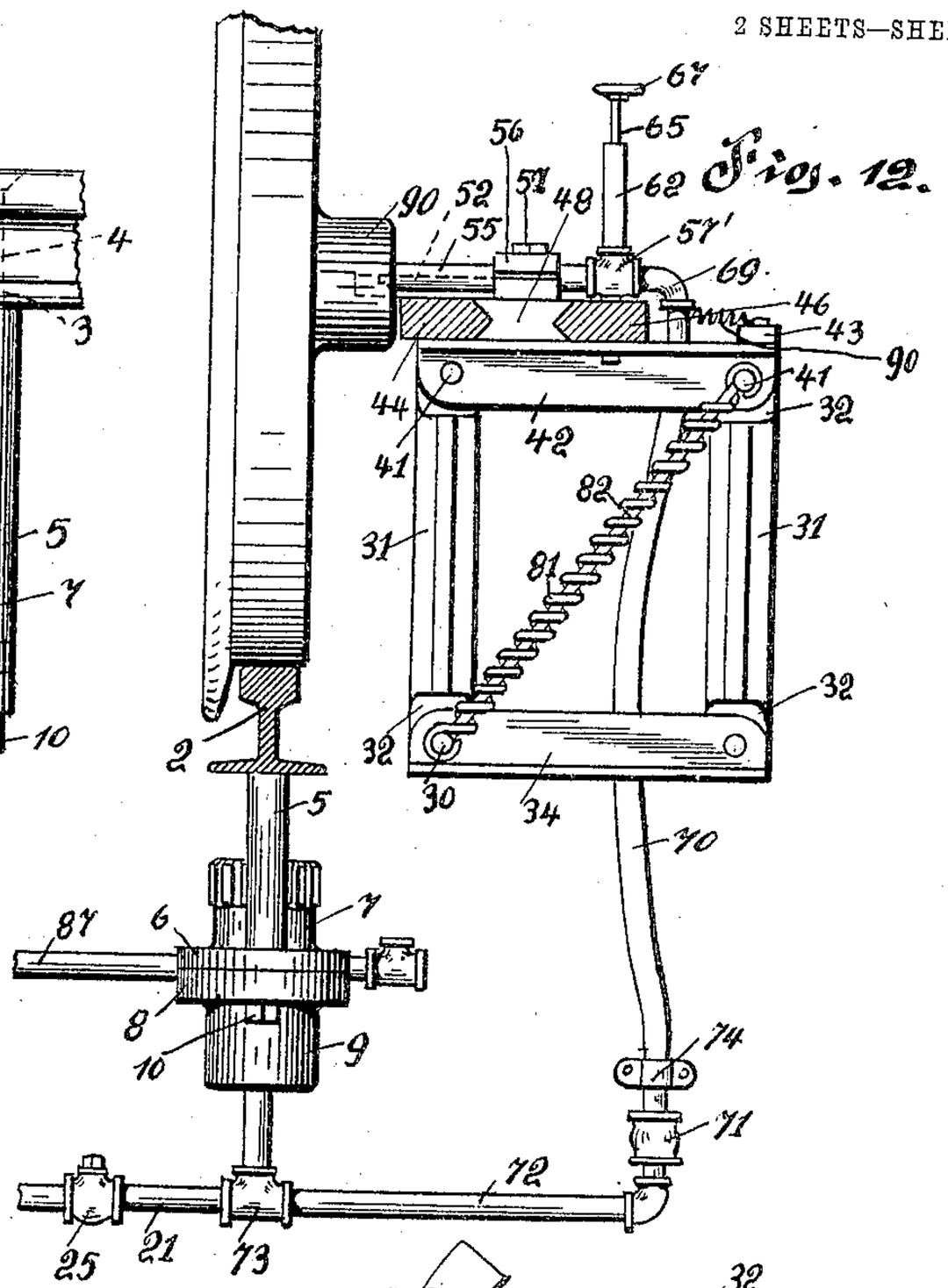




Fig. 12.

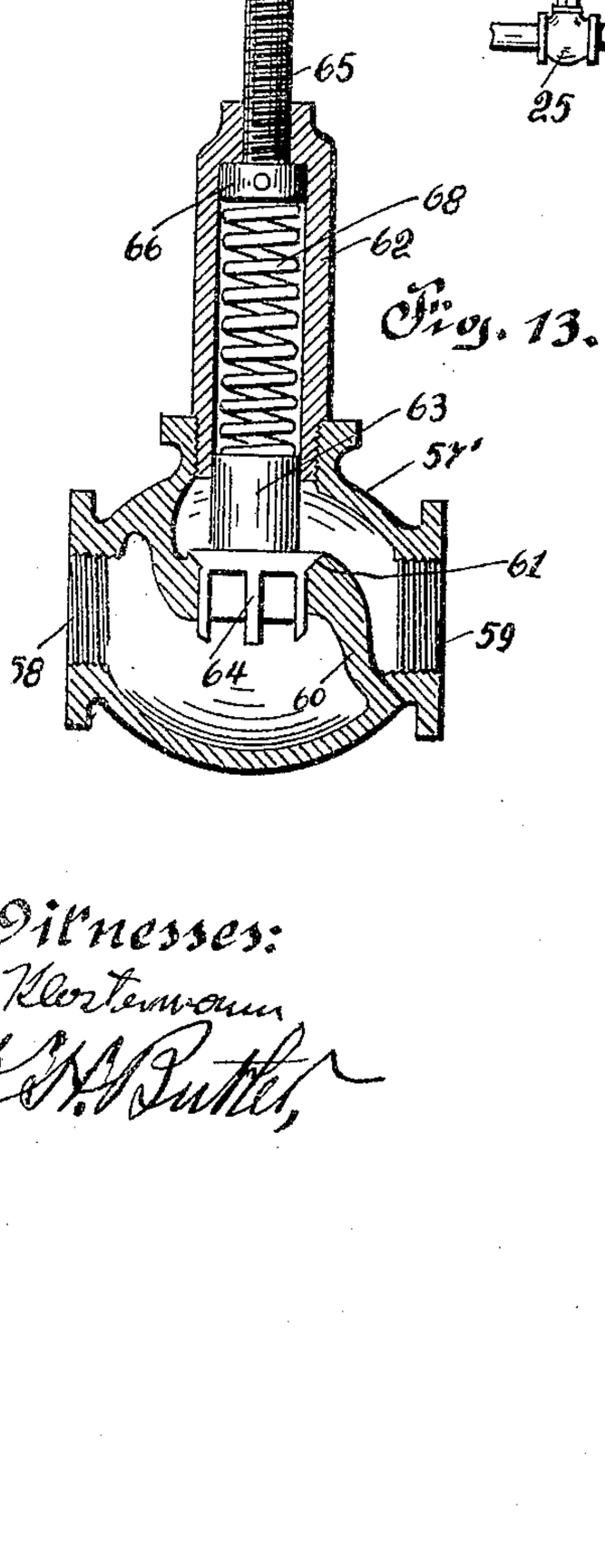



Fig. 13.

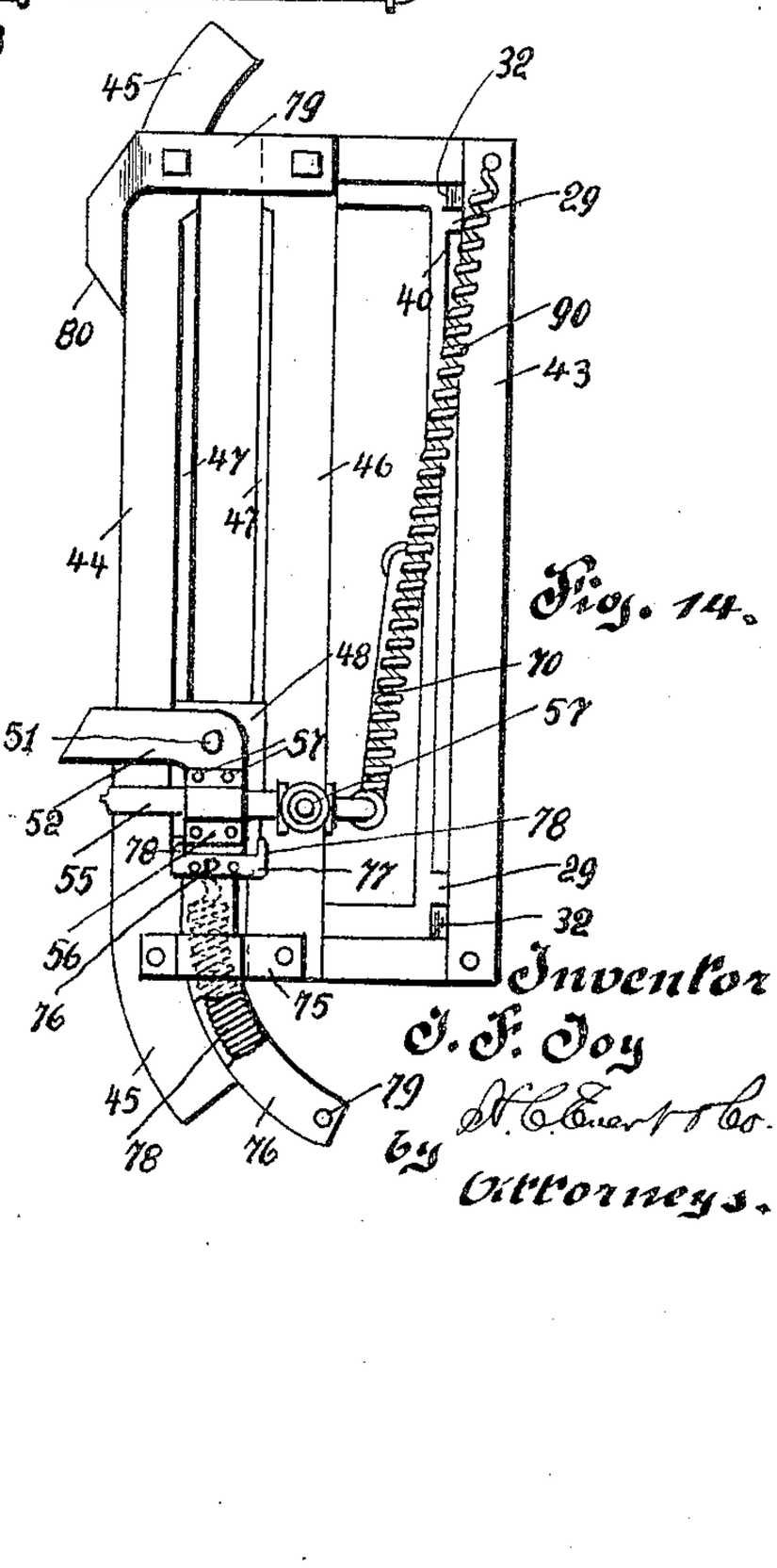



Fig. 14.

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# UNITED STATES PATENT OFFICE.

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## LUBRICATOR FOR CARS.

No. 813,214. Specification of Letters Patent. Patented Feb. 20, 1906.

Application filed April 17, 1905. Serial No. 255,960.

*To all whom it may concern:*

Be it known that I, JOSEPH F. JOY, a citizen of the United States of America, residing at Monongahela, in the county of Washington and State of Pennsylvania, have invented certain new and useful Improvements in Lubricators for Cars, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in lubricators for cars; and the invention has for its object the provision of novel means for automatically lubricating cars while they are in motion.

My invention aims to dispense with the labor heretofore employed for lubricating cars, this factor, in connection with rail constructions, amounting to considerable expense and time.

I have devised a novel apparatus adapted to automatically feed predetermined quantities of oil to cars while they are in motion, the apparatus being actuated by the movement of cars over the section of track adjacent to the apparatus. In this connection novel mechanisms are employed—such as pumps actuated by the cars, resilient frames, traveling members adapted to move with the car, and novel forms of valves for controlling the amount of lubricant to be fed to the car—all of these elements being combined to provide a positive and effectual lubricator for cars.

The present invention is particularly adapted for use in connection with mining-cars and will be hereinafter described as such; but it is obvious that the lubricator is applicable to railways used for other purposes.

The preferred embodiments of my invention are illustrated in the accompanying drawings, it being manifest that the structural features of my invention are susceptible to various changes without departing from the general spirit and scope of the invention.

Reference will now be had to the accompanying drawings, wherein like numerals of reference designate corresponding parts throughout the several views, in which—

Figure 1 is a front elevation of my improved lubricating apparatus, illustrating the truck of a car in position to be lubricated. Fig. 2 is a side elevation of a movable nozzle-supporting member. Fig. 3 is a top plan view of a cam-arm carried by my improved apparatus. Fig. 4 is a top plan view of the nozzle-supporting member. Fig. 5 is a top plan view of one of the horizontal frames of my improved apparatus. Fig. 6 is a side elevation of one of the side frames of the apparatus. Fig. 7 is a detail view of an angle-bar employed to brace and strengthen the resilient framework of my improved apparatus. Fig. 8 is a top plan view of a horizontal guide carried by the framework of my improved apparatus. Fig. 9 is a similar view of another guide adapted to coöperate with the guide illustrated in Fig. 8. Fig. 10 is a detail view of a movable block adapted to reciprocate in the guides illustrated in Figs. 8 and 9. Fig. 11 is an enlarged side elevation view of a portion of the track equipped with my improved pump, illustrating the car-actuating means. Fig. 12 is an enlarged end view of a portion of my improved apparatus, partly in vertical section. Fig. 13 is a vertical sectional view of a novel form of valve employed in connection with the apparatus, and Fig. 14 is a top plan view of the resilient frame of the apparatus.

To put my invention into practice, I have illustrated in Fig. 1 of the drawings a cross-tie or supporting-beam 1, which comprises one of the supporting members of the track, and it is upon this track that my improved apparatus is adapted to be supported and operated. The rails 2 2 of this track are provided with vertically-disposed apertures 3 3, in which are mounted headed depending bolts or rods 4 4. Upon the depending ends of these rods are mounted sleeves 5 5, carrying an annular cylinder-head 6, centrally of which is formed a stuffing-box 7. Upon the rods 4 4 is secured the flanged end 8 of a pump-cylinder 9, nuts 10 10 being employed to lock the sleeves 5 5 and the pump-cylinder upon said rods. In the pump-cylinder is mounted a piston-head 11, carrying a piston-rod 12, which extends upwardly through the stuffing-box 7. The rail 2 is provided with a vertically-disposed aperture 15, through which protrudes the beveled end 16 of a rod 14, mounted in said piston-rod. The rod is screw-threaded, as indicated at 17, and provided with a nut 18, whereby the movement of said rod can be governed and the rod adjusted, whereby it will have the desired

stroke. Between the piston-head 11 and the bottom of the pump-cylinder I mount a conical spring 19, adapted to normally retain the piston-head in an elevated position, whereby the beveled end 16 of the piston-rod will normally protrude above the tread of the rail. This construction is identical upon each of the rails 2 2, and reference will now be had to Fig. 1 of the drawings, wherein the connections between the pumping-cylinders and a suitable reservoir are illustrated. Each of the pump-cylinders 9 is connected by pipes 20 and 21 to a main supply-pipe 22, that in turn communicates by a pipe 23 with a suitable reservoir (not shown) that is located adjacent to the pump-cylinders 9. The pipe 21 is provided with a union 24 to facilitate the connecting of said pipes and the check-valve 25. The pipe 20 is provided with a T connection 26 and a check-valve 27. Before describing the remainder of the connections used with the pump-cylinders 9 reference will be had to the resilient frames of my improved apparatus.

As before stated, the supporting-beams or cross-ties 1 are adapted to support my improved apparatus, and upon these cross-ties or beams outside the rails 2 2 I mount resilient frames consisting of two horizontal frames 28 28, (see Fig. 5,) which are substantially rectangular in top plan view and carry upon their longer sides outwardly-extending pierced lugs 29 29. Secured to said lugs by bolts 30 30 are upwardly-extending side frames 31 31. These side frames are substantially rectangular in top plan view and are provided upon their longer sides with bosses 32 32 and 33 33, and through the bosses 33 33 the bolts 30 30 are adapted to extend.

The reference-numerals 34 34 designate angle-bars having apertures 35 and 36 formed therein, and these angle-bars are employed for bracing the resilient frames of my improved apparatus and are preferably mounted upon the beams 1 by suitable bolts or spikes 37, passing through the apertures 36 and engaging said beams. The apertures 35 are employed whereby bolts or rivets 38 can be used to secure the horizontal frame 28 in engagement with the angle-bar 34, the horizontal frame being provided in its ends with apertures 39 to receive said bolts or rivets.

Another horizontal frame 40 is employed similar to the frame 28 previously described. The horizontal frame 40 is mounted upon rods 41 41, extending through the bosses 32 32 of the side frames 31 31. Angle-bars 42 42, similar to the angle-bars 34, are secured to the ends of the horizontal frame 40 to brace and strengthen the rectangular resilient framework of my improved apparatus. The reference-numeral 43 designates a longitudinally-disposed bar which is secured to the upper rear edge of the frame to serve functionally as a brace and strengthening-rib. Mounted upon the front top edge of the frame is a guide 44, having curved ends 45 45, which protrude beyond the ends of the frame. Mounted upon the top of the frame parallel with the guide 44 is a guide 46, and the confronting edges of said guides are beveled, as indicated at 47, to receive a movable block 48. The edges of this block are grooved, as indicated at 49 49, to receive the beveled edges 47 of the guides 44 and 46, and this construction prevents the block 48 from becoming disengaged from the guides after they have once been placed in position. In one end of the block 48 I provide a vertically-disposed aperture 50, and upon said block is swiveled by a bolt 51 a nozzle-supporting member 52. This member is substantially angular in top plan view and its one end is pierced, as indicated at 53 53, and grooved, as indicated at 54. In the groove 54 is mounted a nozzle 55, which is secured therein by a clamping member 56 and screw-bolts 57. The nozzle 55 is provided upon its rear end with a valve 57′, which is illustrated in vertical section in Fig. 13 of the drawings. The valve comprises a casing having an inlet-port 58 and an outlet-port 59. These two ports are separated by an angular-disposed partition 60, having a valve-seat 61 formed therein. In the top of the valve is mounted a sleeve 62, in which is slidably mounted the stem 63 of a valve 64, which is adapted to normally rest in the valve-seat 61. In the upper end of the sleeve 62 is mounted a screw-threaded stem 65, carrying a head 66 and a hand-wheel 67. Mounted between the head 66 and the stem 63 of the valve 64 is a coiled spring 68, adapted to normally retain the valve 64 in its seat 61. The object of this valve will be presently described. The inlet-port 58 of the valve is provided with an elbow 69, and to this elbow is connected a hose 70, adapted to extend downwardly through the resilient framework of my improved apparatus and connect with a coupling member 71, carried by a pipe 72, which is connected to the T 73, carried by the pipe 21. A suitable clamp 74 may be employed for supporting the hose 70 at an intermediate point adjacent to the resilient frame.

Upon one end of the guides 44 and 46 is mounted a bracket 75, in which is secured a curved pipe 76. Mounted upon the end of the block 48 is a plate 77, having outwardly-extending lugs 78 78, which are adapted to engage upon each side of the clamping member 56 and limit the swinging movement of the nozzle-supporting member. In the pipe 76 is mounted a coiled spring 78, the one end of which is attached to the pipe, as indicated at 79′, while the other end of said spring is connected to the movable block 48, and when said block is carried forwardly toward the cam-arm 79, the spring 78 is adapted to return the block to its normal position. Upon

the opposite ends of the guides 44 and 46 is mounted a cam-arm 79, having a beveled edge 80. The object of this arm will be described in the general operation of my improved lubricating apparatus.

Mounted diagonally across the resilient framework of my improved apparatus is a coiled spring 81, the one end of which is attached to one of the bolts 49, while the other end thereof is attached to one of the bolts 30. In said spring is mounted a rod 82, which is made of a sufficient length to fit snugly between the bolts 41 and bolt 30 and retain the resilient frame in an upright and vertical position when not otherwise moved during the operation of my improved apparatus.

The reference-numeral 83 designates an oblong catch basin or trough which is approximately the length of the resilient frame, and this catch-basin is mounted directly beneath the path of travel of the nozzle 55. The catch-basin is supported by a pipe 84, communicating by a pipe 85 with the main supply-pipe 23. The pipe 85 is provided with a check-valve 86.

The reference-numeral 87 designates a pipe extending beneath the tracks 2 2 to the resilient frame upon the opposite side of the tracks, and this pipe supports a catch-basin 88, similar to the catch-basin 83. The hose 70 of the opposite resilient frame is connected to the T 26.

The apparatus constructed in accordance with my invention operates as follows: In Fig. 1 of the drawings I have illustrated the truck of a car in position to receive a suitable lubricant from my improved apparatus, and the protruding ends of the axle 89 of the truck are provided with suitable housings or oil-cups 90, in which it has been the practice to place waste saturated with oil. As the car-truck moves into alinement with my improved apparatus the housings or oil-cups engage the outer ends of the nozzle-supporting members, slightly turning said members until the protruding ends of the nozzle 55 protrudes within the opening formed in the housings or oil-cups 90. Simultaneous with said movement the wheels of the truck engage the beveled ends 16 of the pistons 12 12 and depress the same. This movement of the piston-rods 12 12 causes the piston-heads 11 11 to descend, forcing the contents of the pump-cylinders through the pipes 20 and 72 to the hose connections 70 and to the nozzles 55, from where the lubricant is carried into the housings or oil-cups 90 90 of the trucks. Simultaneously with the depression of the piston-rods 12 12 the nozzle-supporting member is being moved forwardly between the guides 44 and 46 on account of the end of the nozzle-supporting member engaging the housings or oil-cups 90. The nozzle-supporting members travel at approximately the same speed as the car passing through the apparatus, and during this time the lubricant is being continuously discharged from the nozzles into the housings or oil-cups of the truck. The forward movement of the nozzle-supporting member causes the spring 78 to become expanded, and upon the wheels of the truck striking the beveled face 80 of the cam-arm 79 the resilient frames will be moved outwardly from the car, causing the ends of the supporting members 52 52 to become disengaged from the housings or oil-cups 90 90, at which time they are returned to their normal position by the spring 78, and the apparatus is now in position to lubricate the next succeeding car. When the piston-rods 12 12 have been released by the wheels of the track, the springs 19 return the piston-rods 12 12 to their normal position, and the pump-cylinders are again refilled by the supply-pipes 23, 22, 20, and 21.

Between the elbow 69 and the one end of the longitudinally-disposed bar 43 I mount a spring 90, the one end of the spring being attached to the elbow, while the other end of the spring is attached to the bar 43, as indicated at 91. This spring is employed, whereby when the spring 78 has returned the nozzle and block 48 to its normal position (illustrated in Fig. 14 of the drawings) the spring 90 will slightly rotate the nozzle-supporting member and turn the end of the nozzle 55 inwardly a degree or two to prevent it from being struck by the oil-cup or housing 9 prior to its engagement with the end of the nozzle-supporting member. It will of course be understood that the spring 78 is of a greater strength or tension than the spring 90.

The valves 57′ are employed to govern the pressure at which the oil is to be fed into the housings or oil-cups 90. By adjusting the screws 65 the movement of the valves 64 64 can be controlled and regulated to suit the pressure of oil or lubricant passing through the valve-bodies. The valves 64 are adapted to close immediately upon the pressure being released by the receding of the piston-heads 11 11. The amount of oil or lubricant to be ejected into the housing or oil-cups can be regulated by adjusting the nuts 18 upon the piston-rods 12, thus being employed to lengthen and shorten the stroke of the piston-rods, and consequently increasing or decreasing the capacity of the pumping-cylinders. During the operation of my improved apparatus should any oil drop during the operation of ejecting oil into the housings or oil-cups the catch-basins serve to return the oil to the main supply-pipe. The check-valves have been employed to prevent return movement of the oil after the injection strokes of the piston-rods 12 12 have taken place.

From the foregoing description, taken in connection with the drawings, it will be observed that I have devised a novel automatic lubricating apparatus adapted to quickly

and effectually lubricate the trucks passing through the apparatus, thus dispensing with the employment of labor to perform this operation.

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

1. In an apparatus of the class described, the combination with a supporting-track, and a supply-pipe, of pumps communicating with said supply-pipe, resilient frames mounted on the track at the outside of the rails thereof, nozzle-supporting members slidably mounted upon said frames, nozzles carried by said members and connected to said pumps, means to simultaneously actuate said pumps, and said movable nozzle-supporting members, and means to return said nozzle-supporting members to their normal position, substantially as described.

2. In an apparatus of the class described, the combination with a supporting-track, of resilient frames mounted at opposite sides of the track, nozzle-supporting members slidably mounted on said frames, nozzles carried by said members, the pumping-cylinders connected to said nozzles, means to simultaneously actuate said pumping-cylinders and said nozzle-supporting members, means for moving said resilient frames out of engagement with the actuating means, and means to return the pump-actuating means and the nozzle-supporting members to their normal position.

3. In an apparatus of the class described, the combination with a supply-pipe, a trackway and rolling-stock, of pump-cylinders connected to said supply-pipe and actuated by said rolling-stock, resilient frames mounted upon each side of said trackway, nozzles slidably mounted upon said side frames and connected to said pumping-cylinders, means actuated by said rolling-stock to force the contents of said pumping-cylinders through said nozzles, catch-basins mounted beneath said nozzles and connected to said reservoir, means actuated by said rolling-stock to return said nozzles to their normal position, substantially as described.

4. In an apparatus of the class described, the combination with a trackway, a supply-pipe and oil-cups, of rolling-stock, resilient frames mounted upon each side of said trackway, nozzles slidably mounted upon said frames and adapted to move with said rolling-stock, pumping-cylinders connected to said supply-pipe and said nozzles, means actuated by said rolling-stock to inject the contents of said pumping-cylinders through said nozzles into said oil-cups while the rolling-stock is in motion, and means to return said nozzles to their normal position, substantially as described.

5. In a lubricating apparatus of the class described, the combination with movable oil-cups or housings and a lubricant-supply pipe, of resilient frames mounted adjacent to said movable cups, movable nozzles mounted upon said frames, pumping-cylinders connected to said nozzles and said supply-pipe, means to simultaneously move said nozzles into engagement with said oil-cups and to actuate said pumping-cylinders to inject said lubricant into said cups, check-valves controlling the movement of said lubricant, adjustable pressure-valves controlling the movement of said lubricant, means to move said nozzles out of engagement with said cups, and means to return said nozzles to their normal position, substantially as described.

6. In an apparatus of the class described, the combination with a lubricant-supply pipe and movable oil-cups, of movable nozzles mounted in close proximity to said movable cups and adapted to engage said cups at predetermined times during the movement of said oil-cups, and means to inject the lubricant from the supply-pipe into said movable oil-cups, substantially as described.

7. In an apparatus of the class described, the combination with movable oil-cups or housings and a lubricant-supply, of frames mounted adjacent to said movable cups, nozzles slidably mounted upon said frames and communicating with said lubricant-supply, means to retain said nozzles in engagement with said movable cups, means to release said nozzles, and means actuated by the movement of said cups to inject lubricant from the supply through said nozzles into said cups, substantially as described.

8. In an apparatus of the class described, the combination with a lubricant-supply and movable oil-cups or housings, of resilient frames, nozzles slidably mounted upon said frames and communicating with said lubricant-supply, means to retain said nozzles in engagement with said oil-cups, means actuated by said movable oil-cups to inject a portion of the contents of said lubricant-supply through said nozzle into said oil-cups, means to regulate the last-named means, means to release said nozzles from engagement with said oil-cups, and means to return the overdischarge of said nozzles to said reservoir, substantially as described.

9. In a lubricating apparatus of the class described, the combination with movable oil-cups or housings, of nozzles, means to move said nozzles a predetermined distance with said cups, means to inject a lubricant through said nozzles into said cups during the movement of said nozzles, and means to disengage said nozzles from said cups, substantially as described.

10. In a lubricating apparatus, the combination with movable oil-cups or housings, of nozzles, means to move said nozzles a predetermined distance in unison with said mov-

able cups, and means to inject a lubricant through said nozzles into said cups, substantially as described.

11. In a lubricating apparatus, the combination with a supporting-track, of frames mounted outside the rails of the track, nozzle-supporting members slidably mounted on said frames, nozzles carried by said members, pumping-cylinders connected to said nozzles, pistons in said cylinders actuated by a car moving on said rails, means for actuating said nozzle-supporting members, and means to return the pistons and nozzle-supporting members to their normal positions.

In testimony whereof I affix my signature in the presence of two witnesses.

JOSEPH F. JOY.

Witnesses:
K. H. BUTLER,
E. E. POTTER.