

(No Model.)

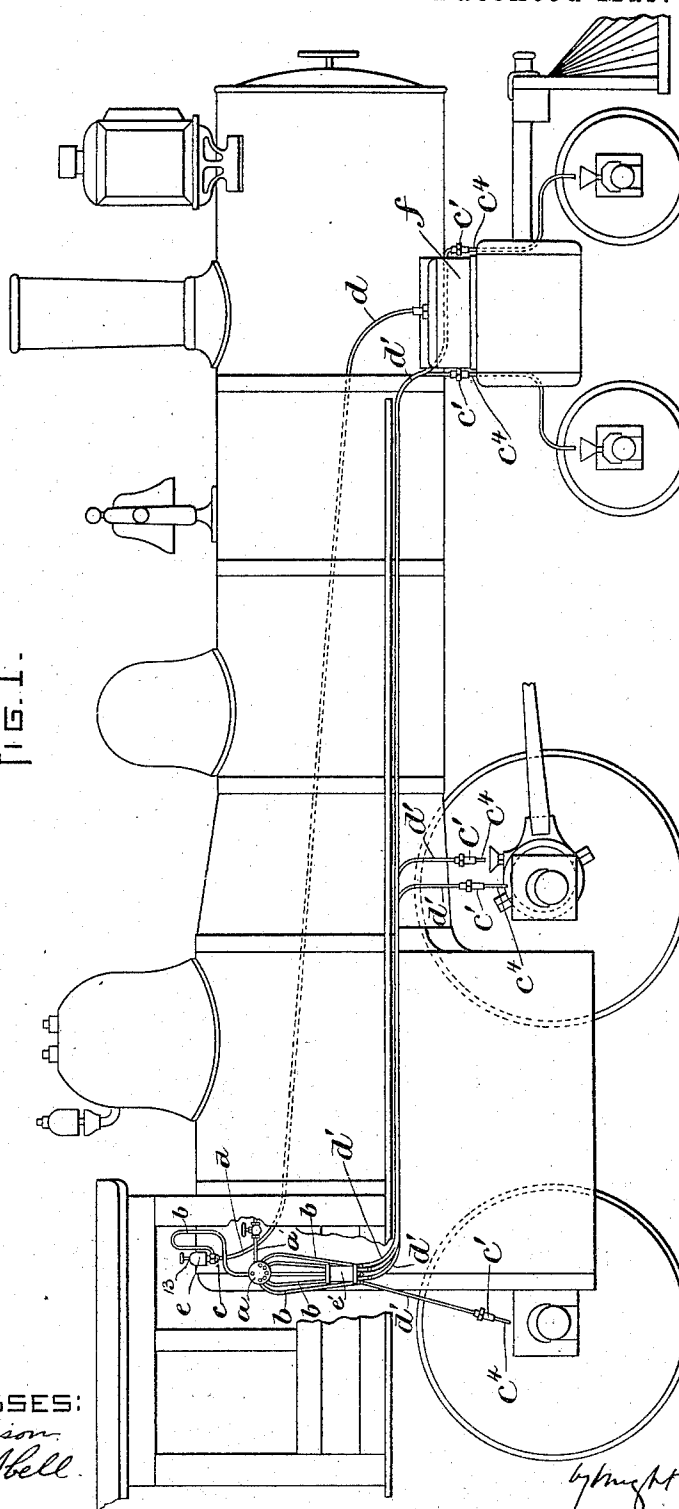
3 Sheets—Sheet 1.

J. MEDWAY.
LUBRICATOR.

No. 535,953.

Patented Mar. 19, 1895.

FIG. 1.



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(No Model.)

3 Sheets—Sheet 2.

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FIG. 2.

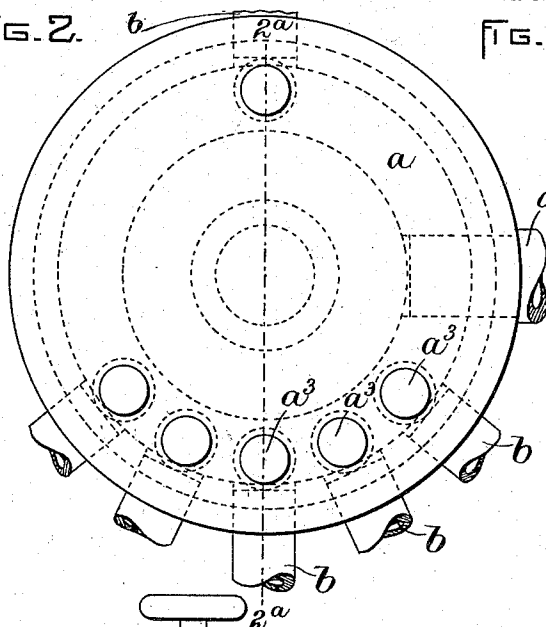


FIG. 2^a

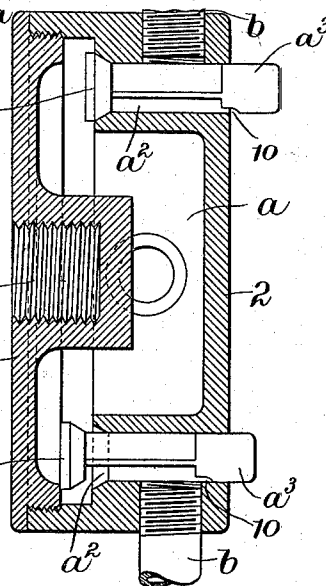


FIG. 3.

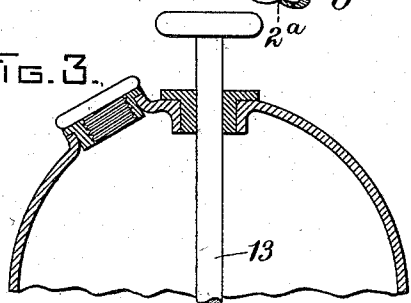


FIG. 5.

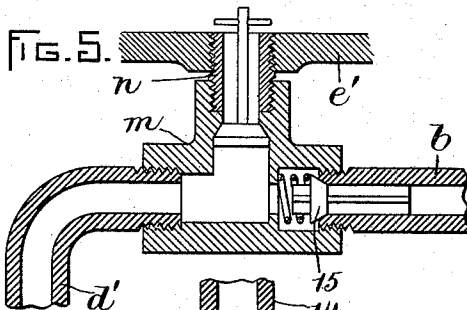
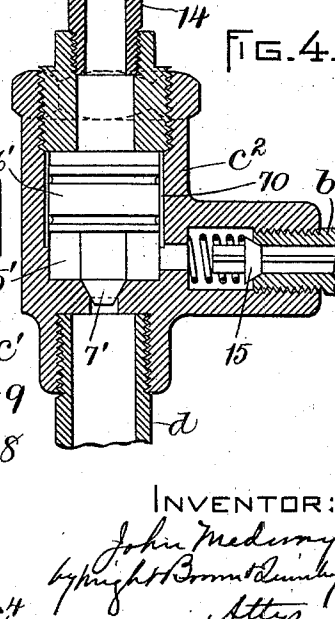
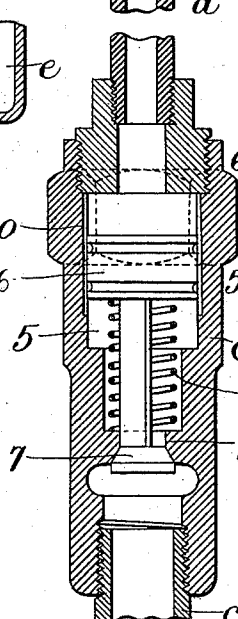
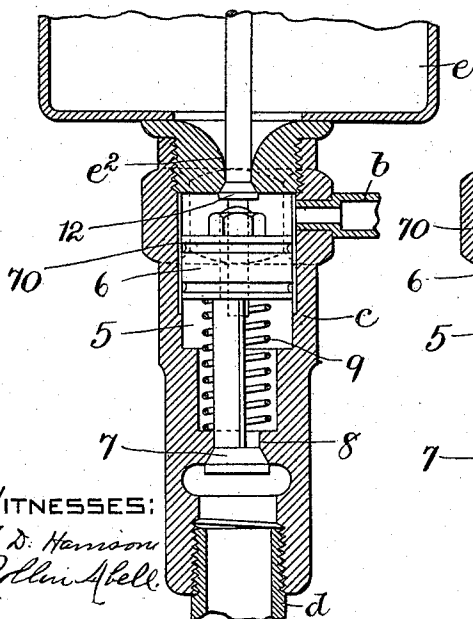


FIG. 4.



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FIG. 7.

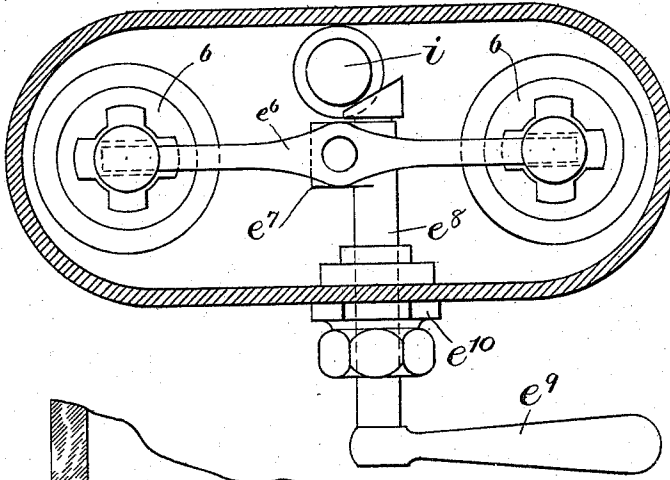
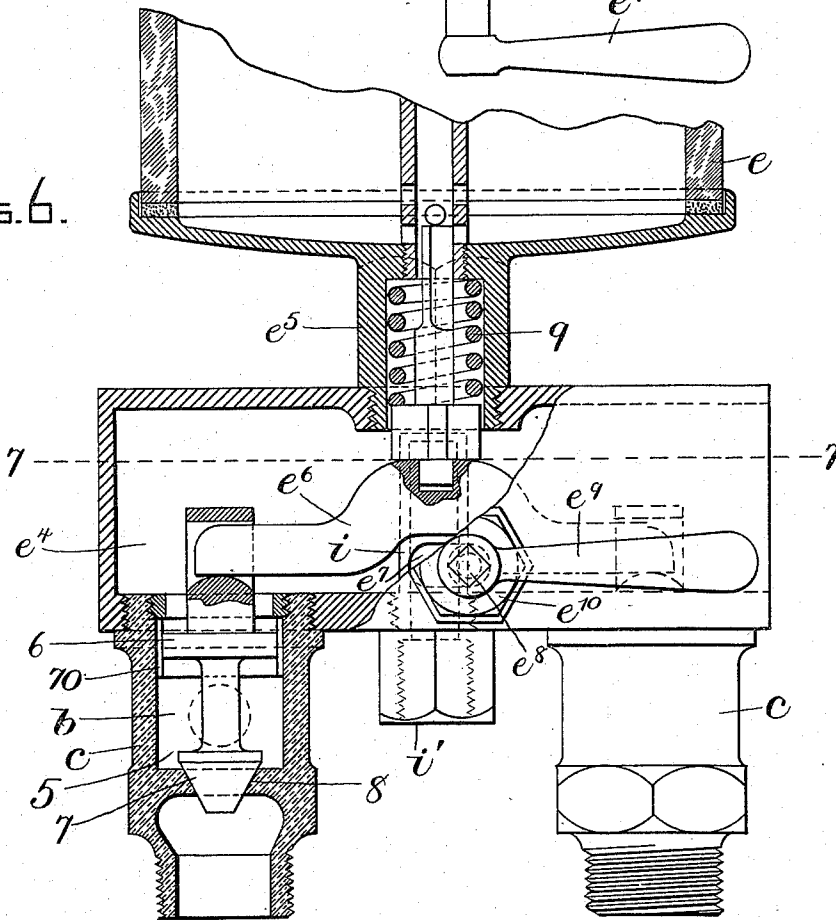


FIG. 6.



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UNITED STATES PATENT OFFICE.

JOHN MEDWAY, OF CAMBRIDGE, MASSACHUSETTS.

LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 535,953, dated March 19, 1895.

Application filed January 7, 1895. Serial No. 534,064. (No model.)

To all whom it may concern:

Be it known that I, JOHN MEDWAY, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Lubricators, of which the following is a specification.

This invention has for its object to provide a force-feed lubricator or lubricating apparatus which shall be certain in its operation and that will supply a pre-determined charge of the lubricant at each operation, so that excessive discharge or waste of the lubricant may be avoided.

To this end, the invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification,—Figure 1 represents a side elevation of a locomotive provided with a lubricating apparatus embodying my invention. Fig. 2 represents a plan view of the pressure reservoir forming a part of said apparatus. Fig. 2^a represents a section on line 2^a—2^a of Fig. 2. Fig. 3 represents a sectional view showing an oil reservoir and an oil-measuring chamber connected therewith and constituting a part of the apparatus. Fig. 4 represents a sectional view of another form of oil-measuring chamber. Fig. 5 represents a sectional detail hereinafter referred to. Fig. 6 represents a partial vertical section and partial side elevation of the preferred construction for use in lubricating the valves in the steam-chests. Fig. 7 represents a section on line 7—7 of Fig. 6.

The same letters and numerals of reference indicate the same parts in all the figures.

In the drawings—*a* represents a pressure reservoir, which receives compressed air (or steam) from any suitable source of supply, through a pipe *a'*. The reservoir is here shown as composed of two sections 2, 3 secured together, the section 3 having a screw-threaded socket 4 formed to engage a threaded shank or stud affixed at a suitable point in a locomotive cab or elsewhere. Within said reservoir is formed a series of passages *a*² extending from the interior of the reservoir to the outer surface thereof and containing push-pieces *a*³ on the inner ends of which are formed valves *a*⁴ which normally bear on seats at the inner ends of the passages *a*², and close

the latter to prevent the escape of the compressed air, said push-pieces projecting from the outer surface of the reservoir so that they can be manipulated or pressed inwardly by the operator to open said passages and permit the escape of compressed air therethrough.

b b b represent a series of pressure supply-pipes communicating with the passages *a*² and extending from the reservoir *a* to supply compressed air or steam to a corresponding series of oil-measuring chambers hereinafter described. Said chambers receive oil by gravitation from a suitable reservoir or reservoirs and deliver the oil to the parts to be lubricated, each pressure supply-pipe supplying air to a separate measuring-chamber.

In the present case, I have shown two oil reservoirs, *e* and *e'*. The reservoir *e* in the construction shown in Fig. 3 supplies oil to a single measuring-chamber *c* that delivers oil through a pipe *d* to the slide-valve in the steam-chest *f*, the oil being drawn by suction to the steam-chest through pipe *d*; while in the construction shown in Figs. 6 and 7, said reservoir *e* supplies oil to two measuring-chambers *c*, each connected with one of the steam-chests. The reservoir *e'* supplies oil through delivery pipes *d'* to a series of measuring-chambers *c'* located at various other points, as shown in Fig. 1.

Each measuring-chamber is constructed to receive a predetermined quantity or charge of oil, sufficient for one lubrication, and delivers the same to the pipe leading to the part to be lubricated when the corresponding valve *a*⁴ in the pressure reservoir is manipulated, as hereinafter described, so that oil is supplied to the different valves, bearings, &c., in pre-determined charges without waste.

Each measuring-chamber comprises a casing having a cylindrical receptacle 5, which receives oil from the accompanying reservoir and compressed air or steam from the pressure reservoir.

The measuring-chamber *c* shown in Fig. 3 has an oil-inlet *e*² communicating directly with the oil reservoir *e*, while the two chambers *c* shown in Fig. 6 communicate with an intermediate chamber *e*⁴ which is in constant communication with the reservoir *e* through a neck *e*⁵, the pressure supply-pipes *b* being connected with said chamber. The chambers

c' are at the outer or lower ends of the delivery pipes d' , which are connected at their upper ends with the reservoir e' by T couplings m (shown in section in Fig. 5) and short nipples n , said couplings receiving the pressure supply-pipe b , the arrangement being such that both air and oil enter the delivery pipes d' , as hereinafter described.

A piston 6 is fitted to move in each measuring-chamber, and is connected with a valve 7 which, when the piston is in its normal position, closes an outlet passage 8 which in the measuring-chamber or chambers connected with the reservoir e is connected with the delivery pipe d . In each of the other measuring-chambers the outlet passage 8 is connected with a short delivery pipe or nozzle c^4 . When the valve a^4 controlling the pressure supply-pipe b is opened by the operator, the compressed air or steam liberated thereby acts to displace the piston 6, causing it to open the valve 7 and thus release the charge of oil which had previously found its way thither from the oil reservoir, the pressure being prevented from forcing oil upwardly into the reservoir e by a suitable check-valve 12, shown in Fig. 3 as a loose valve, which is raised and closes the oil-inlet e^2 when the pressure is admitted, said valve opening by gravitation and permitting oil to flow through said inlet when the pressure is shut off. In Figs. 4 and 6, said check-valve is shown as the upper portion of the piston.

When the valve a^4 is released by the operator, it is closed by the pressure in the reservoir a , and brings a vent opening 10 in the push-piece a^3 into position (as shown at the top of Fig. 2^a) to release the pressure in the pipe b ; whereupon the piston and valve are returned to their normal position either by a controlling spring 9, as shown in Figs. 3, 5, and 6, or by gravitation, as shown in Fig. 4.

In Figs. 3 and 5, the valve-controlling spring is arranged to raise the piston and thus cause the latter to close the valve 7; while in Fig. 6, the spring acts through a yoke e^6 upon the two pistons and valves connected with said yoke. The pressure supply-pipe b may be provided with a check-valve 15 adapted to prevent the flow of oil into the pipe and to permit the entrance of compressed air.

It is practicable to liberate the charges of oil that are held by the chambers c for the valves in the steam-chests, without the use of steam or compressed air, said charges being drawn to the steam-chests by suction, as already stated. I have therefore provided means for manually operating the pistons and valves in the said chambers c , so that if a supply of air or steam is not available, or if the use of such supply is not desired, the oil can be released from the chambers c by hand. In Fig. 3, the result is accomplished by means of a rod or stem 13 attached to the check-valve 12 and extending through the top of the reservoir e , so that it may be moved endwise by

hand to displace the piston and valve. In Figs. 6 and 7, the same result is produced by means of a cam e^7 arranged to act on the yoke e^6 , said cam being affixed to a rock-shaft e^8 which is journaled in a stuffing-box or packed bearing e^{10} in one side of the chamber e^4 and has an external handle or lever e^9 .

The inner wall of each measuring-chamber is provided with leakage grooves 70 so arranged that when the piston is in its normal position oil will flow freely by or around it and thus fill the measuring-chamber.

It will be seen that the delivery pipe d which conducts oil to the slide-valve is empty, each charge of oil being drawn through said pipe by suction in the steam-chest. Each of the delivery pipes d' , on the other hand, is always full of oil, the pressure which depresses the piston and opens the valve being exerted on the piston through the body of oil in said pipe.

The measuring-chamber c^2 , which I show in Fig. 4 as a modification, comprises a casing having an oil receptacle 5', a piston 6' therein, and a valve 7' attached to said piston. The upper portion of said measuring-chamber c^2 is connected with the reservoir e by a suitable connection, such as 14, which conducts oil from the reservoir to the measuring-chamber. The air or steam pressure in this case enters the lower part of the measuring-chamber and raises the piston, causing the upper end of the latter to act like the check-valve 12 before described and close the oil-inlet of the measuring-chamber, the piston at the same time opening the valve 7', so that the charge of oil is then ejected by the air or steam pressure from the measuring-chamber. When the air or steam pressure ceases, the piston descends sufficiently to open the measuring-chamber inlet and close valve 7', whereupon a charge of oil flows from the reservoir through the leakage grooves 70 to the lower portion of the measuring-chamber, the oil being prevented from entering the air-pipe b by the spring-controlled check-valve 15.

It will be seen from the foregoing that when a valve in the pressure reservoir is opened by the operator, the air or steam released opens the corresponding measuring-chamber and causes the delivery of a charge of oil at the desired point.

This apparatus is especially valuable for locomotive engines, because it enables the engineer or fireman to quickly and economically lubricate a large number of the frictional parts from the cab, each measuring-chamber being caused by the depression of a push-piece to deliver a predetermined quantity of oil and no more, so that waste of oil is prevented.

It is obvious that the invention may be embodied in an apparatus comprising but one series of parts, namely, one pressure supply-pipe and its valve, and one oil-measuring-chamber. The apparatus will usually com-

prise a plurality of said parts, however, for obvious reasons.

The check-valves which prevent the pressure admitted to the measuring-chambers from entering the oil reservoir are important, since without them the pressure admitted to any measuring-chamber would be communicated through the oil reservoir to the other chambers, causing a simultaneous discharge of oil from all the chambers. The check-valves therefore permit each chamber to be discharged independently.

i represents a steam chamber which is attached to the bottom of the oil chamber *e*⁴ and projects upwardly into the latter for the purpose of receiving steam to warm the oil in cold weather, said steam chamber having no communication with the interior of the oil chamber, so that it conducts heat to the oil but does not admit the steam to contact with the oil. The chamber *i* has a socket *i'* which is adapted to receive a steam pipe, the latter acting as a supporting standard.

I claim—

1. A force-feed lubricator comprising an oil reservoir, an oil-measuring chamber having an oil-receiving inlet communicating with said reservoir and an oil-outlet connected with a part to be lubricated, a piston in said chamber, a valve connected with said piston and normally held thereby in position to close the outlet of the measuring-chamber, a pressure supply-pipe communicating with said chamber whereby pressure may be introduced into the chamber to displace the piston and valve, a check-valve which is caused by said pressure to close the inlet of the measuring-chamber and prevent the pressure from entering the oil reservoir and is normally open to prevent the free entrance of oil to the measuring-chamber, and means whereby a flow of oil is permitted from the reservoir by or around the piston when the latter is in its normal position.

2. A force-feed lubricator comprising an oil reservoir, an oil-measuring chamber communicating with said reservoir and having an oil-outlet communicating with a part to be lubricated, a piston in said chamber, a valve connected with said piston and normally held thereby in position to close the outlet of the chamber, and manually operated means whereby the piston may be displaced to open the valve and release a charge of oil.

3. A force-feed lubricator comprising an oil reservoir, a plurality of oil-measuring chambers communicating with said reservoir, each having an outlet communicating with a part to be lubricated, pistons in said chambers, valves connected with said pistons and

adapted to close the outlets of the chambers, a yoke connecting the said pistons, a spring whereby the pistons and valves are normally held in position to close the outlets of the chambers, and a manually operated lifting device whereby the yoke may be raised to simultaneously displace the pistons and valves.

4. A force-feed lubricator comprising an oil reservoir, a plurality of oil-measuring chambers communicating with said reservoir, each having an outlet communicating with a part to be lubricated, pistons in said chambers, valves connected with said pistons and adapted to close the outlets of the chambers, a yoke connecting the said pistons, a spring whereby the pistons and valves are normally held in position to close the outlets of the chambers, and a yoke-lifting cam within the reservoir provided with an operating handle or lever outside the reservoir whereby the yoke, pistons, and valves may be simultaneously displaced.

5. A force-feed lubricator comprising an oil reservoir, a plurality of oil-measuring chambers each having an oil-inlet communicating with said reservoir and an oil-outlet communicating with a part to be lubricated, pistons in said chambers having outlet-closing valves, said pistons being normally in position to close said valves, a pressure reservoir, a plurality of pipes connecting said reservoir with said chambers, normally closed valves controlling said pipes and adapted to be manually operated to admit pressure to the chambers, and check-valves in the oil-inlets of the measuring-chambers adapted to be closed by the pressure admitted to the chambers and prevent the pressure from entering the oil reservoir, whereby each chamber is adapted to be independently discharged.

6. A force-feed lubricator comprising an oil reservoir, an oil-measuring chamber which receives a charge of oil from the oil reservoir, a piston in said chamber provided with a valve which normally closes the outlet of the chamber, a pressure reservoir, a pressure supply-pipe connecting the pressure reservoir with the chamber, and a normally closed valve controlling said pipe and adapted to be manually operated to admit pressure to the measuring-chamber, said valve having means for liberating air from the said pipe when the valve is closed.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 31st day of December, A. D. 1894.

JOHN MEDWAY.

Witnesses:

E. BATCHELDER,
ROLLIN ABELL.