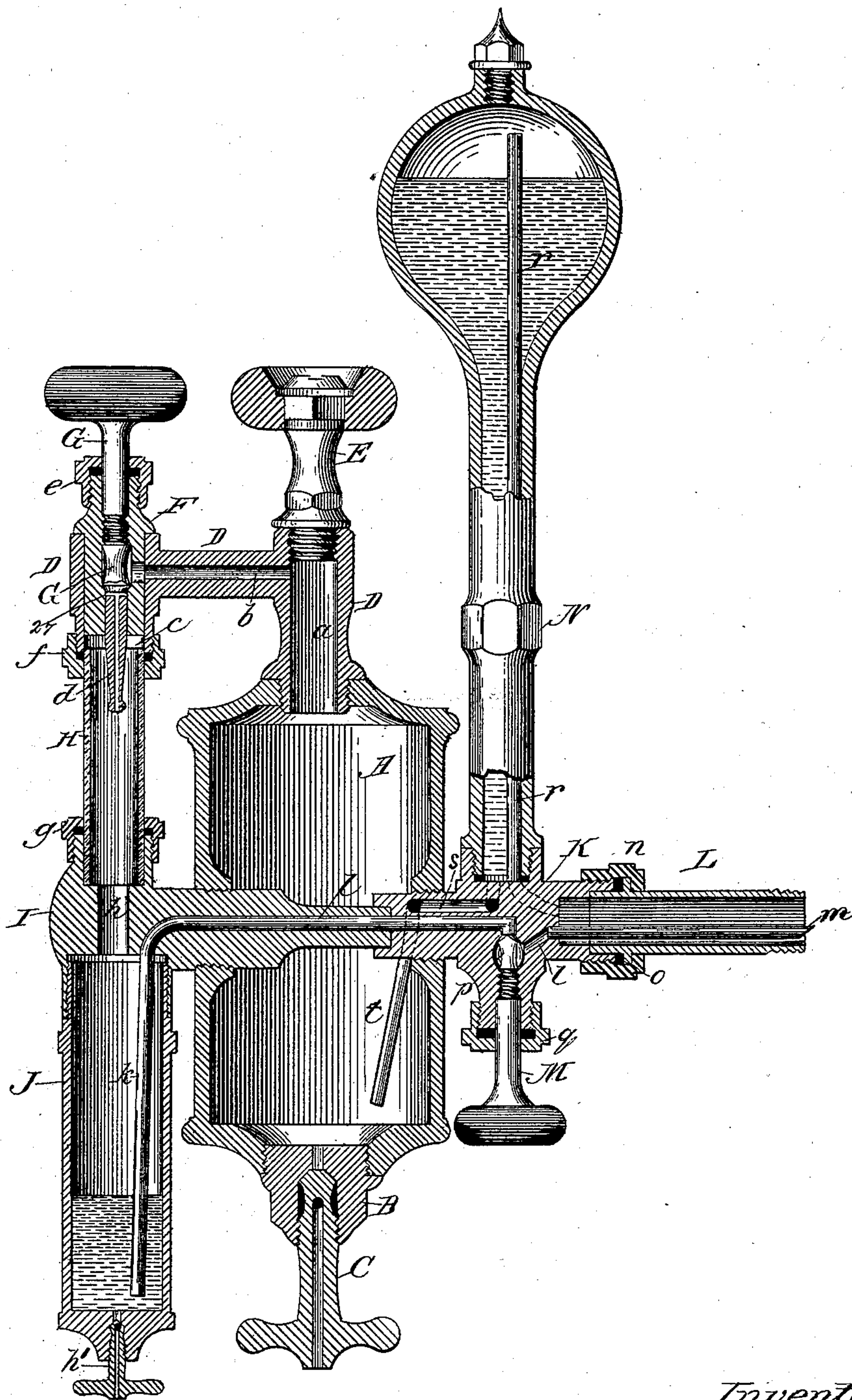


(No Model.)

S. REID.
LUBRICATOR.

No. 294,152.

Patented Feb. 26, 1884.



Witnesses.

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LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 294,152, dated February 26, 1884.

Application filed June 11, 1883. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL REID, a subject of the Queen of Great Britain, residing in Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Lubricators, of which the following is a specification.

My invention relates to improvements in lubricators in which hydrostatic pressure is employed to overcome the pressure of steam against the oil, which lubricators are provided with a glass tube, more commonly termed a "sight-feed," so that by the eye the amount of oil being fed may be determined.

The objects of my invention are to successfully employ in the sight-feed tube of such a lubricator compressed air instead of water, heretofore employed, and to compress said air by the direct and contact pressure of water, to provide means whereby the water compressing the air in the sight-feed tube shall force in the said tube in excess of its normal contents the air contained in the water-compressing passage or chamber.

Further objects of my invention consist in certain operations and in details of construction hereinafter described, and shown in the accompanying drawing, in which is illustrated a vertical section of a lubricator embodying my invention.

Referring to said drawing, A represents an oil-reservoir, cylindrical in form, having tapped in its bottom a plug, B, into which plug is fitted a valve, C, providing for drawing off the water from the oil-reservoir, and the plug for removing sediment and other accumulations.

Tapped in the upper end of the reservoir is a pipe or casting, D, provided with a vertical passage, *a*, opening into the reservoir at one end, and at the other closed by a plug, E, and intersecting with a horizontal passage, *b*, which in turn opens into a vertical passage, *c*, of the pipe D.

Projected into the passage *c* of the pipe D is a centrally-perforated plug, F, fitting into which is a valve, G, terminating in a nozzle, *d*, a tight joint between the valve and plug being secured by a cap, *e*, tapped upon the end of the plug, and containing a suitable packing embracing the stem of the valve.

Fitting in the passage *c*, and secured to the pipe D by a collar, *f*, is one end of a sight-feed tube, H, the lower end of which is fitted and secured by a collar, *g*, containing a suitable packing in a casting, I, having a passage, *h*, and which, with the hollow metallic cylinder J, tapped therein, may be said to be a continuation of the pipe D broken by the glass tube H, or, in other words, that the glass tube H is held between the two sections of a pipe, one of which is composed of the parts I and J and the other of the part D, in substantially the same manner that the glass tube of a water-gage is held in place.

Cylinder J forms a water-compressing passage or chamber, and is closed at its lower end by a valve, *h'*, for permitting a supply of air to enter the chamber and glass tube prior to putting the lubricator in operation, and has projecting therein and opening near its bottom a tube, *k*, forming a continuation of a passage, *l*, formed in the casting I, tapped horizontally in the reservoir, and joined to a four-way casting, K, projected into the lubricator from the opposite side. Into this four-way casting the passage *l* continues, and opens into a spout, *m*, which, when the lubricator is attached, projects into the steam-pipe or other device, to which the lubricator is secured by a short joint, L, secured in one arm of the casting K by a collar, *n*, tapped thereon, and embracing an annular flange, *o*, on the joint L, a suitable packing intermediate the casting and flange being employed to form a tight joint.

Controlling the passage *l* is a valve, M, located in one of the arms of casting K, and working in an enlargement, *p*, of the passage *l*, the direction of the passage being diverted at this point, so that it opens into the enlargement in different planes, as clearly shown, a cap, *q*, serving to form a tight joint between the valve and casting.

Tapped in the casting K is the stem N of a condenser or other suitable head of water, communicating in the present instance (as shown by passage in dotted lines in casting K) with the steam-pipe or other device to which the lubricator is attached, said passage opening at its other end in a steam-pipe, *r*, extending up into the condensing-chamber, the stem of

which chamber communicates with the oil-reservoir by a passage, *s*, and a tube, *t*, opening near the bottom of the reservoir.

With the above-described lubricator attached to a steam-pipe or other device to which oil is fed, and the reservoir and passages *a* and *b* filled with oil, the operation is as follows: Valve *G* is closed and valve *M* is open, when steam immediately rushes through spout *m*, passage *l*, and pipe *k*, but before reaching the water-chamber *J* is condensed, and the water, rising therein, will force the air contained in the chamber into the glass tube *H* and compress the air formerly in the chamber with that already in the tubes. In the meantime the steam entering the condenser will have condensed, and these condensations, if not cut off by a valve (not shown) in the four-way casting, will enter the reservoir and exert an upward pressure on the oil. The valve *G* is now opened, and as a result the head of water in the condenser will force the oil through the nozzle *d* and the sight-tube, floating the oil upon the water in the chamber *J*, which floating oil forms, as it were, a piston, against which the continuing pressure from the condenser operates and forces the water back through the pipe *l* and spout *m* to the steam-pipe, the oil of course following and feeding to the pipe, which feed of the oil is regulated by the valve *G*.

It will be seen that in commencing the operation of the lubricator the normal quantity of air in the glass tube is materially increased by that displaced in the water-chamber *J*, and by practical experiment this excess of air in or supply to the glass tube is necessary to keep the exposed portion of the tube free from any accumulation of oil in the tube, for without an excess of air the normal or air at atmospheric pressure would be so compressed that the oil would extend up into and obscure a portion of the tube. This excess of air also enables the employment of a materially shortened glass tube; but it has another function of vital importance to its successful use in a sight-feed tube—namely, that of an air-feed to the tube to supply the air particles continually being carried off by the oil-globules in their passage through the tube to their destination. The amount of air carried off by the globules is such that if only the air contained normally in the tube were employed but a short time is required to reduce this volume of air to such an extent that the oil will rise above the mouth of the nozzle, and hence destroy the function of the tube. In the construction shown the amount of oil being fed is determined by the passage of oil through the sight-feed tube; but the same result may be obtained by the

and this may be done by closing or dispensing with the passage *b* and by connecting the condenser in lieu thereof with the plug *F*, instead of casting *K*, then dispensing with so much of the passage *l* as is formed in the casting *I*, and projecting the pipe *K* into the passage at the top of the reservoir. In these positions half of the oil in the reservoir could be fed through the passage *l* in the casting *K*; but to feed its entire contents the casting *K* should be tapped in or toward the top of the reservoir, instead of at its center of length, as now shown. By this construction the flow of water from the condenser would pass through the nozzle *d* into the chamber *J*, in which the water would rise until an equilibrium of pressure on the air had been established sufficient to force the water through the pipe *k* into the reservoir, to displace the oil and cause it to flow through the passage *l* in the casting *K*, the oil so displaced substantially corresponding with the water passing through the sight-feed.

From the above it will therefore be understood that the substitution of a water-feed for one of oil through the sight-feed filled with air is clearly an equivalent of the invention involved in the devices shown, and obviously inferior in operation.

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

1. The herein-described method of compressing and maintaining compressed air in the sight-tube of a lubricator, the same consisting in subjecting the air to a direct pressure of water, afterward displaced by oil under pressure, and in its passage to the device to be lubricated, substantially as described.
2. The combination, in a hydrostatic lubricator, of a sight-feed tube filled with air compressed by and in direct contact with water, substantially as described.
3. The combination, with the lubricator and the sight-feed tube thereof filled with air, of a water-chamber connected with said tube, and in turn having a direct communication with a steam-pipe or other steam-containing device to which the lubricator is attached, whereby condensed steam may be employed for forcing the air from said chamber and compressing it in the sight-feed tube, substantially as described.
4. The combination, in a lubricator, of the sight-feed tube *H*, the chamber *J*, the tube *k*, and devices connecting said parts with the oil-reservoir, the condenser, and the device to be lubricated, substantially as described.

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Witnesses:

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