No. 864,355. PATENTED AUG. 27, 1907.

P. BINDER.

SIGHT FEED LUBRICATOR.

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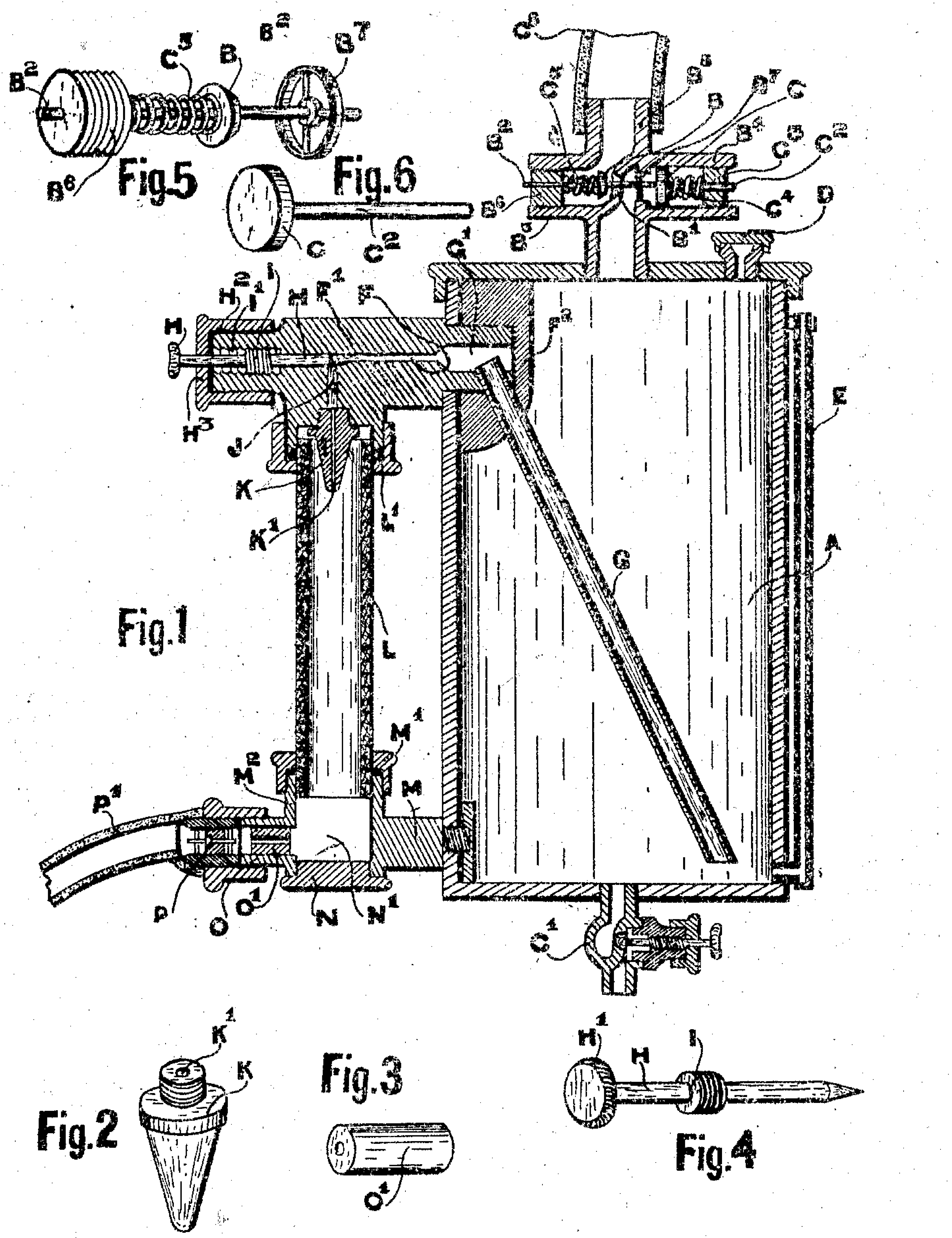

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SIGHT-FEED LUBRICATOR.

No. 864,355. Specification of Letters Patent. Patented Aug. 27, 1907.

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To all whom it may concern:

Be it known that I, PETER BINDER, of the city of Winnipeg, in the Province of Manitoba, Canada, engineer, have invented certain new and useful Improvements in Sight Feed Lubricators, of which the following is the specification.

My invention relates to lubricators, more especially those adapted for feeding lubricating oil to the piston air compressors in train lines, and the object of the invention is to provide a simple, positive acting, cheap and durable lubricator, in which the full sight regulated, drop feed, is supplied to the cylinder, and it consists essentially of an oil receptacle, a filling plug, a gage glass, a drip valve, an inlet valve, an outlet passage-way, a feed pipe within the receptacle, and extending upwardly into the passage-way, a needle feed regulating valve within the passage-way, a sight glass, a feed nipple extending within the top of the sight glass and continuous with the passage-way, bearings for the sight glass, a lead extending from below the sight glass, a choke plug and a check valve, all arranged and constructed as hereinafter more particularly described.

Figure 1 is a vertical sectional view of the lubricator, the section being taken in a plane passing through the center of the oil receptacle and the sight glass. Fig. 2 is an enlarged, detailed, perspective view of the feed nipple which I employ. Fig. 3 is an enlarged, detailed, perspective, view of the choke plug. Fig. 4 is an enlarged, detailed, perspective view of the needle valve which I employ. Fig. 5 is an enlarged, detailed, perspective view of the inlet valve, the valve stem it supports, and an actuating spring. Fig. 6 is an enlarged, detailed, perspective view, of the piston regulating the valve stem.

In the drawings like letters of reference indicate corresponding parts in each figure.

A is the oil receptacle which may be formed of two portions, a body, and a screw top, or preferably consists of a single closed cylindrical casing.

B is a valve, having the valve seat B^1 practically in the form of that of the globe valve.

B^2 is the valve stem, which passes through the valve, and extends on each side.

B^3 B^4 are opposing arms extending from the main pipe B^5, and open into the main pipe. The valve stem B^2 bears at its outer end in a screw plug B^6 in the arm B^3, and at its inner end in a spider B^7, secured in the opposing arm. The valve stem is slidable within its bearings.

C is a piston slidable within the arm B^4, and C^2 is the piston stem.

C^3 is a screw plug within the outer end of the arm B^4, and the stem of the piston passes centrally through the arm, and is slidable therein.

C^4 C^5 are spiral tension springs, of which C^5 is simply a light spring, and C^4 is the standard.

C^6 is a pipe lead passing directly to the compressed air chamber or main reservoir.

D is a filling plug of any ordinary form.

E is a gage glass, supported vertically on the side of the oil receptacle, and having its interior connected at both top and bottom to the interior of the oil receptacle. The gage is simply to show the height of the oil within the receptacle A.

C^1 is a globe valve secured to the bottom of the oil receptacle and is of the ordinary form, and serves the purpose of a drip valve.

F is a passage-way, extending within the member F^1, which is screwed through the side of the oil receptacle A, into an enlargement F^2, formed at the top and within the receptacle.

G is a feed pipe, passing within the receptacle, through the enlargement F^2.

H is a needle valve, extending within the passage-way F, and designed, through the adjusting screw H^1, to regulate the flow through the passage-way.

H^2 is any suitable packing material, and H^3 a packing cap screwed to the member F^1, and through which the stem H^3 of the needle valve extends. In placing the needle valve in position, the enlarged threaded portion I, is screwed within the female thread I^1 in the member F^1, and the packing and the packing cap are afterwards put in place. The adjustment of the flow is regulated by screwing the needle out or in as the case may be, there being a tapering enlargement in the passage-way to form the valve seat.

J is a channel extending downwardly from the face of the valve seat and within the member F^1, and forming when the valve is in open position, a continuous channel with the passage-way F.

K is the feed nipple, screwed into the member F^1, and having an opening K^1 therein, continuous with the channel J.

L is the sight glass, passing over the end of the nipple, and secured in position by means of a packing cap L^1 screwed to the member F^1.

M is a lower support for the sight glass, and is screwed into the side of the oil receptacle A.

M^1 is a packing cap, extending around the bottom of the sight glass and is screwed unto a circular flange M^2, which is continuous with the support M.

N is the screw plug, set directly below the sight glass, and closing the passage-way N^1 formed in the outer portion of the support M.

O is a lead from the passage-way N^1, and O^1 is a choke plug, screwed or otherwise held within the lead.

P is a check valve, placed within the lead O and beyond the choke plug, from the passage-way N^1. However the position of the said check valve is unimpor-

tant, as it may be placed in the lead pipe P^1 or at the cylinder of the engine, the only requirement being that it be outside of the choke plug. The object of the check valve is to prevent back pressure from entering any part of the lubricator.

In actual practice the lubricator that I provide is connected between the compressed air reservoir and the engine cylinder. The lead C extends to the reservoir and the lead P^1 to the cylinder, and it is preferable that the lead P^1 open through the cylinder head. The receptacle A is filled with oil through the filling plug D, and the needle valve H is regulated by the adjusting screw H^1. The back stroke of the piston in the cylinder of the compressor forms a partial vacuum, and the oil is forced upwardly, through the feed pipe G, past the needle valve to the nipple K, by atmospheric or higher pressure. According to the set position of the needle valve the oil feed is governed. The choke plug prevents the oil being swept directly from the nipple to the cylinder in the form of a spray, and allows a drop of oil to collect at the nipple end, and fall the length of the sight glass before it is sucked through the choke plug by the partial vacuum in the cylinder. By means of the needle valve the size of the drop of oil which is allowed to collect can be sight regulated, and the feed governed accordingly.

The check valve is simply to prevent any back pressure within the lubricator on the forward stroke of the piston. The valve B and its mechanism, are adapted to maintain a constant desired pressure on the surface of the oil in the oil receptacle. In train line work, the pressure maintained in the line varies considerably, and to make allowance for this, and to maintain the constant pressure on the oil, as before stated the valve is employed. An outline of its operation is as follows:—Assuming that it is desired to maintain a constant pressure of say 20 pds., on the surface of the oil, the spring C^4 would be a 20 pd. tension spring. Consider the pressure in the pipe C^6 to be 100 pds. The valve is seated when the pressure in the receptacle is 20 pds. Immediately the pressure drops in the receptacle the piston is pressed forward by the 20 pd. spring, and in its forward movement strikes the tip of the valve stem, and eventually unseats the valve. This causes a tendency to equalization of pressure on either side of the valve seat, and as soon as the pressure on the surface of the oil in the oil receptacle comes to 20 pds., the piston is forced backwardly, and the valve again seats itself, by virtue of the spring C^5. By tightening up, or loosening the screw plug C^3, the tension spring pressure may be varied at will.

Although I show a globe drip valve, it is to be understood that any other suitable valve may be employed.

What I claim as my invention is:

In a lubricator for compressors, the combination with the oil receptacle, having an attachment for maintaining predetermined surface pressure on the oil, and an inner enlargement within the upper portion of the receptacle, a filling plug, a gage glass, and a drip cock, of a feed pipe extending upwardly within the receptacle, and bearing within the enlargement, a member screwed to the receptacle and having a duct continuous with the feed pipe, a nipple continuous with the duct, an adjustable needle valve within the duct, a sight glass inclosing the nipple, a lead extending from the sight glass to the compressor, a choke plug within the lead, and a check valve between the choke plug and the compressor, as and for the purpose specified.

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Witnesses:
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