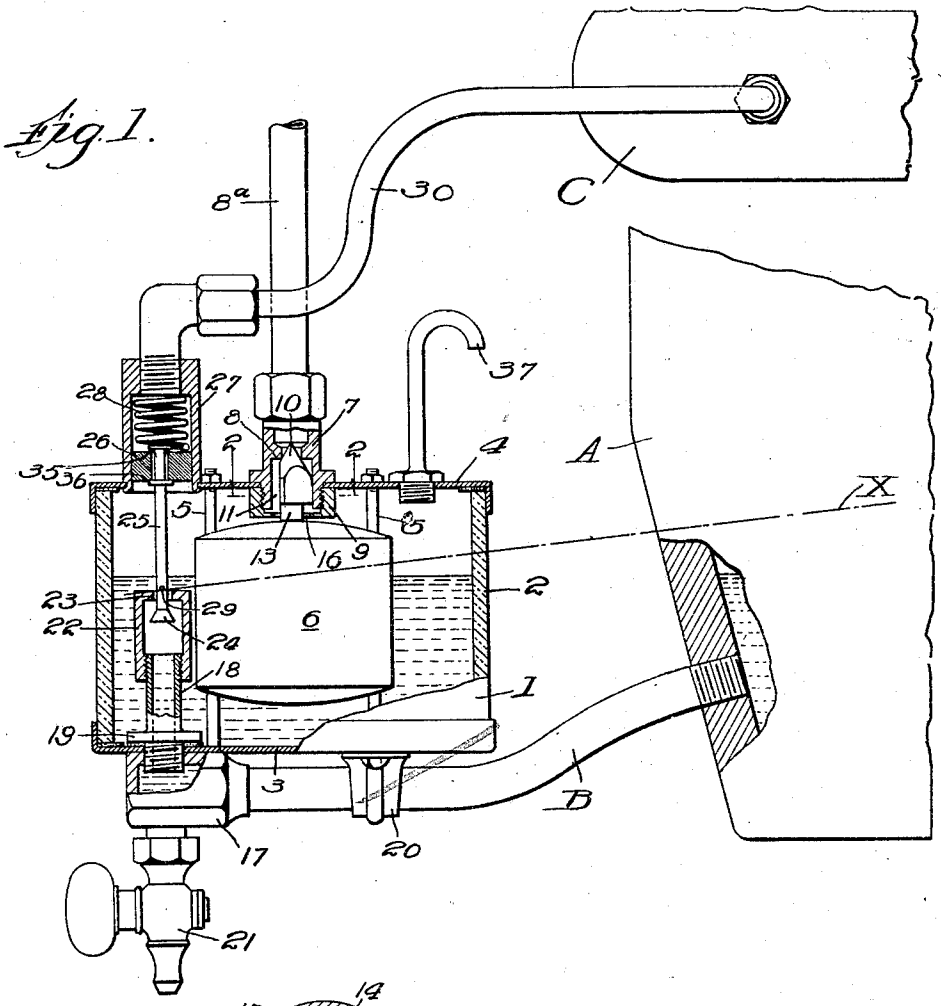
V. N. HANSEN.

ENGINE CONTROLLED LUBRICATING SYSTEM.

APPLICATION FILED JULY 30, 1919.

1,352,954. Patented Sept. 14, 1920.

Fig. 1.



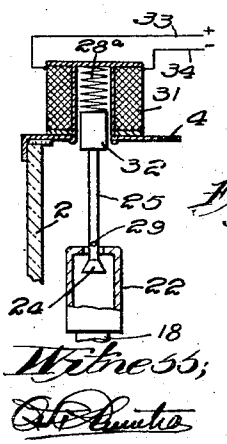


Fig. 4.

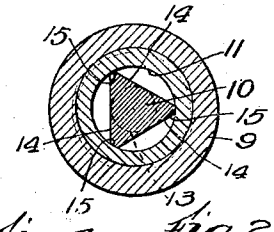


Fig. 2.

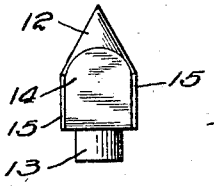


Fig. 3.

Witnesses;

Inventor;
Viggo N. Hansen,

By Baldwin & Baldwin
His Attys.

UNITED STATES PATENT OFFICE.

VIGGO N. HANSEN, OF WINNETKA, ILLINOIS, ASSIGNOR TO STANDEX MANUFACTURING CORPORATION, OF CHICAGO, ILLINOIS, A CORPORATION OF DELAWARE.

ENGINE-CONTROLLED LUBRICATING SYSTEM.

1,352,954. Specification of Letters Patent. Patented Sept. 14, 1920.

Application filed July 30, 1919. Serial No. 314,282.

To all whom it may concern:

Be it known that I, VIGGO N. HANSEN, a citizen of the United States, and a resident of Winnetka, in the county of Cook and the State of Illinois, have invented certain new and useful Improvements in Engine-Controlled Lubricating Systems, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide a device for automatically maintaining a supply of liquid, such as lubricating oil in the crank case of an explosive motor at a substantially uniform level. It consists in the features and elements hereinafter described and shown in the drawings, as indicated by the claims.

In the drawings:

Figure 1 is an elevation, largely in section, showing a device embodying this invention, together with its connections with a motor with which it is associated.

Fig. 2 is a detail section taken as indicated at line, 2—2, on Fig. 1 and showing the inlet valve of the device.

Fig. 3 is a side elevation of the inlet valve.

Fig. 4 is a detail section showing a modified form of controlling means for the outlet valve.

As shown in the drawings, this device is arranged to be used in conjunction with an explosive motor such as the engine of an automobile and to feed lubricating oil to the crank case of the engine which is conventionally illustrated at A in Fig. 1. The feed pipe, B, may be understood as leading laterally into the crank case, A, so that the receptacle, 1, which is the subject of this invention is disposed at one side of the engine in the vehicle and any disturbance of the level of oil in the crank case, A, by reason of lateral inclination of the vehicle on the road will also tend to affect the oil level in the receptacle, 1. The latter is shown as composed of a cylindrical glass wall, 2, having a bottom cap, 3, and top cap, 4, which are held together against the opposite ends of the glass wall, 2, by means of tie bolts, 5, of which three or more are arranged substantially tangent to a circle of the diameter of a float, 6, so as to act as a guide for said float in the receptacle.

The top cap, 4, is furnished with an inlet fitting, 7, connected with an oil fed pipe, 8, which may be understood as leading from any convenient supply receptacle such as an oil tank located on the vehicle at some level higher than that of the receptacle, 1. The fitting, 7, includes a valve seat, 8, and a valve cage, 9, which retains the valve member, 10, controlling the inlet port in the fitting, 7. Preferably the valve, 10, is formed from round stock originally of the diameter of the valve chamber, 11, having one end turned down in conical form at 12, and the other end of reduced cylindrical form as shown at 13, in Fig. 3, while intermediate these portions the valve member is flattened at three sides giving it substantially a triangular cross-section with three flat faces, 14, which however, do not meet in sharp edges but are connected by narrow surfaces, 15, arranged to bear in the cylindrical wall of the valve fitting, 7, for guiding the valve member, 10, therein. The conical end of the valve member serves to close in that part of the fitting while the triangular form affords adequate clearance for flow of oil past the valve when the latter is open. The cage member, 9, is provided with apertures, 16, through which the stem, 13, projects for engagement with the float, 6, but said aperture is much larger than the diameter of the stem, 13, being only enough smaller than the inside diameter of the chamber, 11, to prevent the valve member, 10, falling out of place.

The receptacle, 1, is virtually supported by the laterally projecting pipe, C, the outer end of the pipe being provided with a fitting, 17, which is tapped to receive the lower threaded end of an upstanding outlet pipe, 18, in the receptacle, 1, said pipe having a flange, 19, by which the bottom cap, 3, of the receptacle is thus clamped to the fitting, 17. The receptacle may be further secured to the pipe, C, by means of a strap, 20, attached to the bottom cap, 3, and passing around the pipe, as seen in Fig. 1. For draining the crank case a pet-cock, 21, may be provided on the fitting, 17.

Previous devices of this nature have been arranged with a constantly open outlet leading from the supply of liquid in the receptacle to the interior of the crank case, A, so as to mantain a constant level therein at all times, but when a device of this kind is applied to a road vehicle, it is found that

the constant tipping or lateral inclination of the vehicle so materially alters the vertical relation of the control receptacle, 1, to the crank case by reason of its lateral position with respect thereto that any effective governing of the level of oil in the crank case is hardly feasible. The present device, therefore, includes means for intermittent communication between the governing receptacle, 1, and the crank case, A.

Threaded onto the upper end of the outlet pipe, 18, is a valve chamber, 22, having an outlet port, 23, controlled by a valve, 24, whose stem, 25, extends up for connection with a piston member, 26, mounted for travel in a cylinder, 27, which is set into the top cap, 4, of the receptacle. A spring, 28, in the cylinder, 27, normally holds the piston, 26, at the lower limit of its stroke and thus holds the valve, 24, open at a limiting position determined by a cross-pin, 29, in the stem, 25. The upper end of the cylinder, 27, communicates through a pipe, 30, with the inlet manifold of the engine indicated at C in Fig. 1, so that whenever the engine is running, the partial vacuum which at such times is created in the inlet manifold, C, will operate to draw the piston, 26, upward in the cylinder, 27, compressing the spring, 28, and moving the valve, 24, to its seat, closing the outlet port, 23, and preventinfi flow of oil either from the receptacle, 1, into the crank case, A, or back from the crank case, A, into the receptacle, 1. Whenever the engine stops running, the partial vacuum in the manifold, C, is almost immediately dissipated and no longer acts to hold up the piston, 26, against the pressure of the spring, 28, so that at each cessation of operation of the engine, the valve, 24, is opened by spring, 28, and any discrepancy of level of oil as between the chamber, 1, and the crank case, A, is adjusted and equalized by a flow through the port, 23. As the actual quantity of oil in the crank case, A, under normal conditions is adequate for many miles of travel of the vehicle, it is a practical certainty that the engine will not run continuously long enough to seriously diminish the supply in the crank case, but that stops of the engine will be frequent enough to permit a practically uniform level to be maintained through the operation of the governing receptacle.

It may be understood that other specific means for controlling the valve, 24, through operation and cessation of operation of the engine or motor may be employed, and as illustrating another such device, Fig. 4 shows a solenoid, 31, adapted to be secured in the top cap, 4, of the receptacle, substantially in the same position as the cylinder, 27, shown in Fig. 1, and housing a spring, 28^a, which reacts against a plunger or armature, 32, connected to the pin, 25, of the valve, 24. The solenoid is to be understood as electrically connected with the ignition circuit of the engine, if it be an explosive motor, or if a similar device were to be applied to electrically driven machinery, the lead wires, 33 and 34, could be connected to the power circuit of the electric motor so that when the machine or engine in question is actually operating, the current passing through the wires, 33 and 34, and through the solenoid, 31, will tend to draw the armature up into the hollow central space in the solenoid in opposition to the spring, 28^a, and thus close the valve, 24, while cessation of operation of the machine, involving the cessation of the flow of current through the solenoid, 31, would release the armature, 32, to permit the spring, 28^a, to open the valve, 24. Other expedients such as centrifugally controlled devices for the same purpose might also be provided, the only requirement being that such means be adapted to close the valve, 24, while the engine or machine is operating, and to open it at other times.

I claim:—

1. In a device for the purpose indicated, in combination with a chamber of a motor in which the liquid level is to be governed, a receptacle having a float-controlled inlet and an outlet provided with a valve, together with means actuated by operation of the motor for closing the outlet valve, and means adapted to open the valve upon cessation of such motor operation.

2. In a device as defined in claim 1, the valve closing means comprising a cylinder and a piston therein connected to the stem of the valve, said cylinder communicating with the inlet manifold of a motor.

3. In a device as defined in claim 1, the valve closing means comprising a cylinder and a piston therein connected to the stem of the valve, said cylinder communicating with the inlet manifold of the motor, and a spring constituting means for closing the valve upon cessation of motor operation.

4. In a device as defined in claim 1, a cylinder provided at one end with a connection leading to the manifold of the motor and fitted with a piston in the other end connected to the stem of said valve, together with a spring interposed between the piston and the end of the cylinder communicating with the inlet manifold, and reacting in direction to open the valve, said cylinder and piston constituting the means for closing the outlet valve during operation of the motor.

5. In a device for the purpose indicated, in combination with an engine, a chamber in which the liquid level is to be governed, a receptacle having a float-controlled inlet and an outlet provided with a valve, a control chamber having a movable wall and a con-

nection between said central chamber and a suction passage of the engine together with means connecting said movable wall to the outlet valve for actuating it by the suction of the engine.

6. In a device as defined in claim 1, the valve closing means comprising a piston in a cylinder substantially co-axial with the outlet port, means connecting the cylinder with the motor to permit actuation of the piston by the operation of the motor, and a stem on the valve losely engaging the piston.

In testimony whereof, I have hereunto set my hand at Chicago, Illinois, this 26th day of July, 1919.

VIGGO N. HANSEN.