May 9, 1933. E. RYDER 1,908,189

AUTOMATIC LUBRICATOR

Original Filed Dec. 14, 1928

Fig. 2

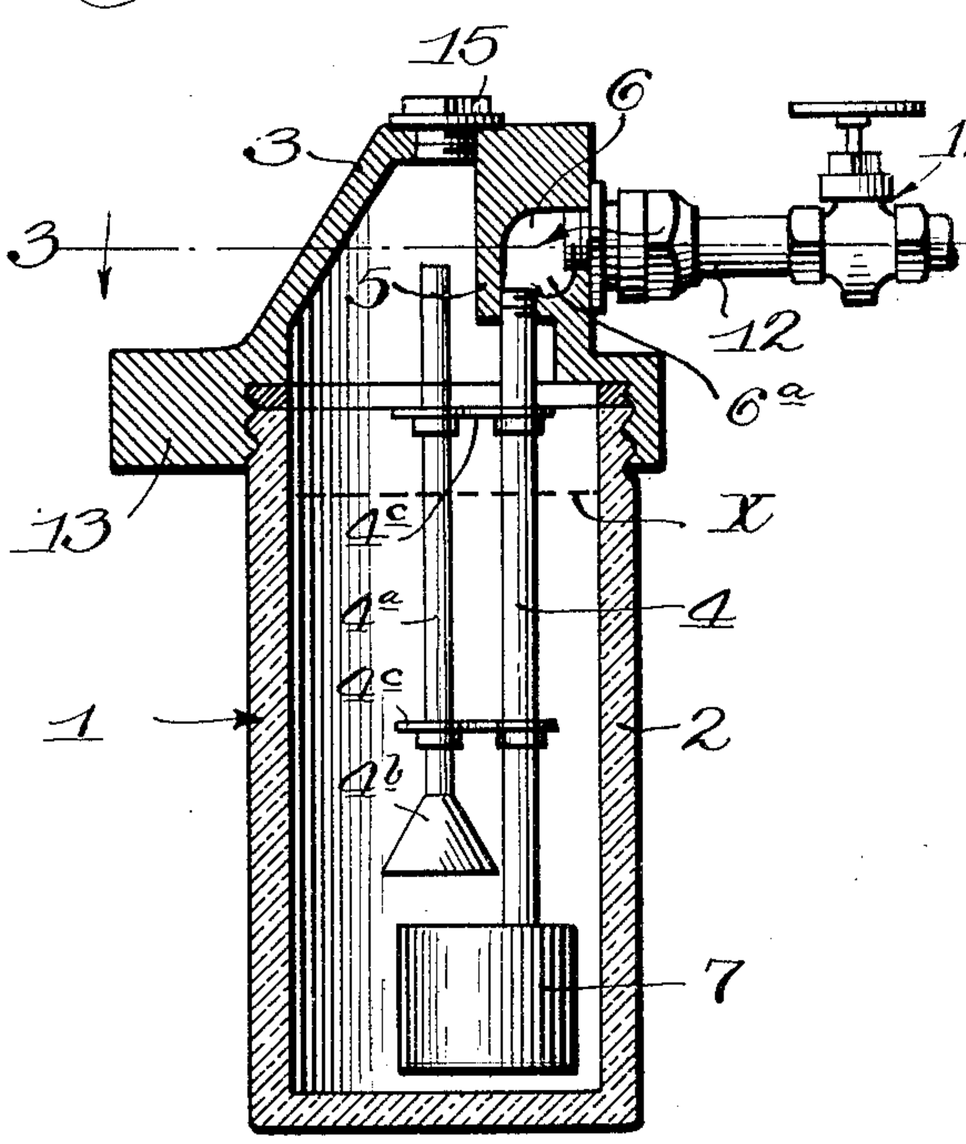



Fig. 1

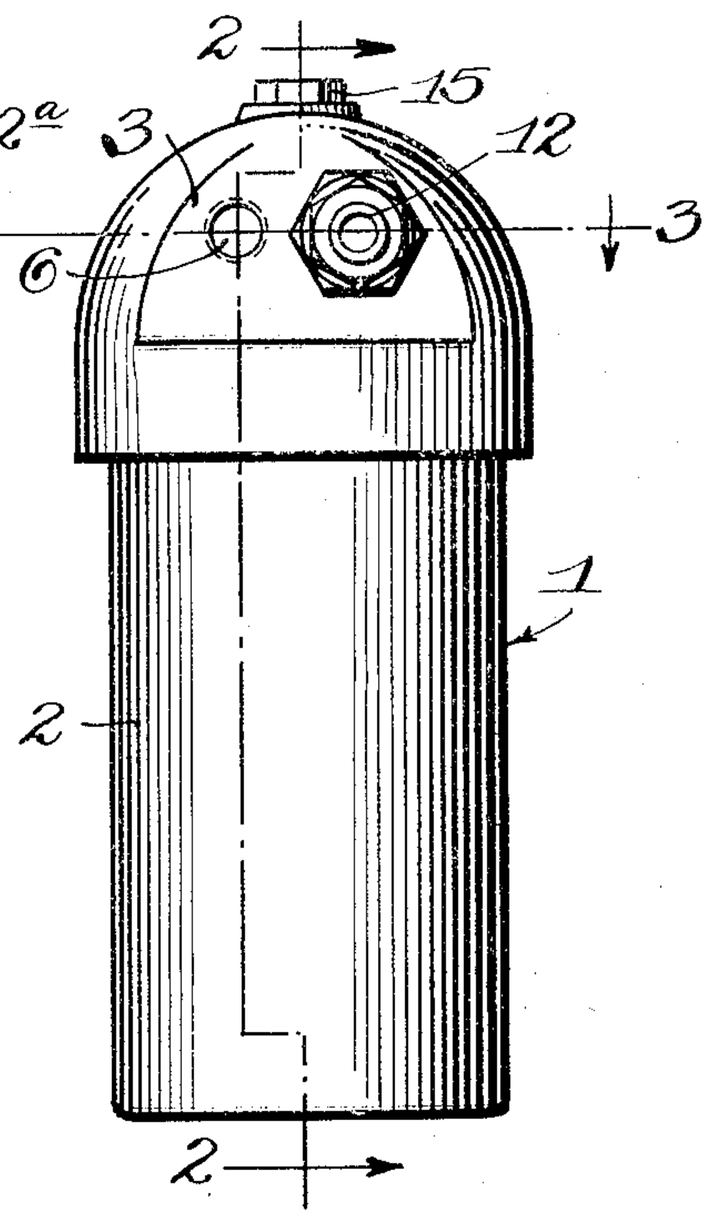
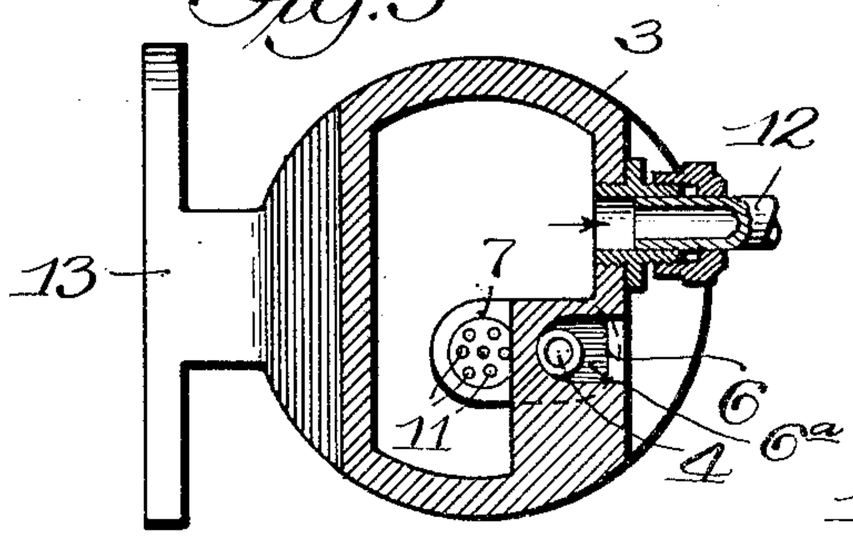



Fig. 3



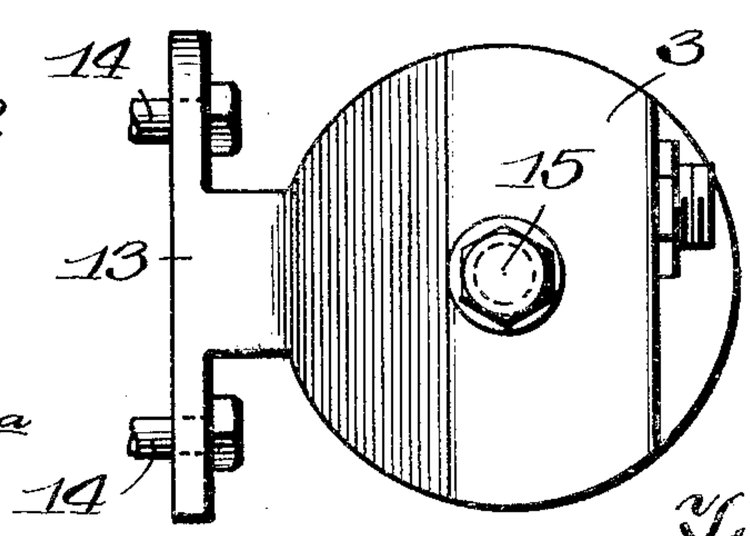
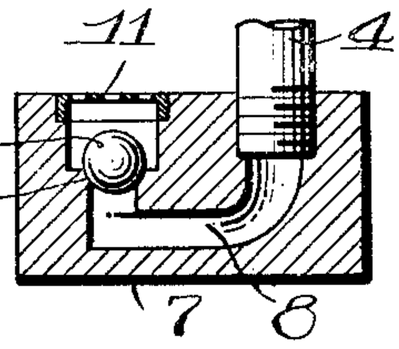




Fig. 4

Fig. 5

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1,908,189

# UNITED STATES PATENT OFFICE

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## AUTOMATIC LUBRICATOR

Refiling of abandoned application Serial No. 325,957, filed December 14, 1928. This application filed November 5, 1932. Serial No. 641,411.

This invention relates to improvements in automatic lubricators for internal combustion engines. The present application is a refile of the abandoned application Serial No. 325,927, filed December 14, 1928, and allowed July 31, 1931.

Lubricators heretofore generally employed for this purpose have been objectionable due to the fact that when the oil supply is exhausted the air intake conduit in the lubricator is directly open to the intake manifold of the engine and permits excessive amounts of air to be drawn into the manifold to so thin the fuel mixture as to spoil proper engine performance. Another objection is that the amount of air drawn into the intake manifold through the lubricator increases as the oil level in the lubricator lowers due to the decrease in the height of the oil column above the air discharge end of the intake conduit thereby producing unevenness in engine operation.

The main object of my invention is to provide the intake conduit with valve means which cuts off the flow of air through the lubricator when the oil supply therein becomes exhausted and also controls the amount of air which can be drawn into the lubricator under the engine suction as long as the valve means is submerged in the oil supply thereby overcoming the objections to lubricators as heretofore employed.

Other and further objects of my invention will appear in the following specification in connection with the accompanying drawing in which—

Fig. 1 is a front elevational view of a lubricator constructed in accordance with my invention;

Fig. 2 is a vertical sectional view taken on line 2—2 of Fig. 1;

Fig. 3 is a horizontal sectional view taken on line 3—3 of Figs. 1 and 2, with the tube $4^a$ removed;

Fig. 4 is a top plan view; and

Fig. 5 is an enlarged vertical sectional view of the valve assembly at the lower end of the air intake conduit.

As shown in the drawing, the lubricator comprises a container 1 made in two sections for the purposes of assembly, cleaning and repair. The lower or body section 2 may be made of glass to display the amount of oil therein and thus indicate when the container needs refilling. The top or cap section 3 may be made of metal, in the form of a casting and have threaded connection with the body 2 as shown.

Located in the container 1 are two vertically disposed tubes 4, $4^a$, both extending down into the oil supply in the container from above its maximum high level $x$ as indicated in Fig. 1. The tube 4 is the air intake conduit in the container and discharges into the tube $4^a$ for the purpose to be presently described. A lug 5 is cast in the cap 3 and has a passage 6 to the inner end of which is connected the upper end of the tube 4. A sump or trap $6^a$ about the passage 6 will collect any lubricant which might escape past the ball valve in case of a backfire of the engine. The outer end of the passage 6 opens to the atmosphere exterior of the cap 3. The lower end of the tube 4 terminates short of the bottom wall of the container and is there provided with a valve means in accordance with my invention.

In the form shown, the valve means comprises a block 7 in which is a substantially U-shaped passage 8 having one end connected with the lower end of the tube 4 and the other end opening upwardly into the oil chamber provided by the container 1. A ball valve 9 is located in the passage 8 adjacent where it opens in the container and normally closes the passage by seating on a seat 10. A screen 11 is fitted in the passage 8 above the valve 9 to prevent the latter from displacement out of said passage.

Connected with the cap 3 at one side of the air passage 6 is a tube 12 which is connected to the intake manifold of the engine with which my improved lubricator is used. A valve $12^a$ may be provided in the intake line to regulate the flow to the engine. By this connection, the pistons in the engine on their suction strokes create a suction in the container 1 above the body of the oil therein and draw air into the container through the air tube 4. This causes the ball valve 9 to

be lifted off of its seat and the incoming air on passing the valve separates into bubbles as it enters the body of oil above the valve. The tube 4ª is arranged directly above the valve and has its lower end flared, as at 4ᵇ, to guide the majority, if not all, of the bubbles into said tube. The bubbles in their upward passage through the tube 4ª displace the oil therein and forcily discharge it with a percolator action out of the upper end of the tube into the space in the container 1 above the oil level therein. This action is more or less violent and causes the air in the container above the oil level to become saturated with oil vapors so that when drawn into the cylinders of the engine with the fuel mixture it will lubricate the walls of the combustion chambers to reduce carbon deposited thereon, and also lubricate the sides of the cylinders and the pistons and the valves which parts are not likely to be properly lubricated by the ordinary lubricating system of the engine.

The valve member 9 is preferably made of metal or otherwise loaded to have some weight and in being arranged above its seat 10 will normally close by gravity against its seat when the suction effort of the engine is not sufficient to lift it. Thus, when the oil level in the container drops below the valve, the normal suction of the engine at the usual running or operating speeds will not lift the valve from its seat or will lift it to such a small extent that the amount of air drawn into the manifold through the empty container will not be sufficient to so lean the fuel mixture as to spoil the performance of the engine. On the other hand, when the valve is submerged in the oil, as when the oil level is above the valve, as in the intended operation of the lubricator, the valve member when lifted from its seat by the engine suction will be practically surrounded by the oil medium and is thus readily liftable from its seat by the suction of the engine. The valve member being relatively heavy, the extent to which it will be lifted from its seat will be in proportion to the suction effort of the engine. In this way, the valve member will automatically regulate the amount of air which can be drawn into the container. This provides for a smooth and even operation of the lubricator and prevents surging of the oil therein, as when no controlling valve is used. Moreover, the valve member 9 offers sufficient resistance to the flow of air past the same to cause the air to break up into a multiplicity of relatively small bubbles which become better charged with oil vapors than the large bubbles which form when there is no resistance to the air flow as heretofore.

The tube 4ª may be supported in the container 1 in any desired manner. Brackets 4ᶜ, 4ᶜ are shown for the purpose in Fig. 2. Those brackets may be flat strips of sheet metal with openings therein at their opposite ends to receive the tubes 4, 4ª and tightly fit the same with a press fit to support the tube 4ª from the air tube 4.

The cap 3 is provided on its rear side with an outwardly projecting lug 13 by means of which the container may be attached to a suitable support by screw or bolts 14, 14 as shown in Fig. 4. The support may be the dash of the car, the lubricator being at such time located beneath the hood. The cap 3 is provided with a filling opening which is normally closed by a screw plug 15 as shown in Figs. 1, 2 and 4.

By my invention, the action of the lubricator when under suction, is smooth and even in that there is a steady flow of bubbles up through the body of the oil and no surging of the oil in the container, as when the tube 4 has an interrupted opening into the container. The valve means also controls the supply of air which can be drawn into the engine through the container as the valve means prevents excessive amounts of air being drawn up through the oil. The valve device may be gravity acting to avoid the use of springs to close it which would have to be overcome by the suction of the engine.

The details of structure and arrangements of parts shown and described may be variously changed and modified without departing from the spirit and scope of my invention.

Having thus disclosed my invention,

I claim:

1. An automatic lubricator for internal combustion engines, comprising a container containing a body of oil, means for connecting the interior of the container above the oil level therein with the suction side of the engine, a conduit located within the container and extending down into the body of oil therein, said conduit having its upper end open to the atmosphere for the intake of air and its lower end opening into the container for the discharge of air into the same, valve means normally closing the discharge end of the conduit and automatically opening under the suction effort of the engine, and a vertical tube interposed between the suction connection of the container and the valve with the ends of the tube located in close proximity to the suction connection and valve respectively.

2. An automatic lubricator for internal combustion engines, comprising a container containing a body of oil, means for connecting the interior of the container above the oil level therein with the suction side of the engine, a conduit located within the container and extending down into the body of oil therein, said conduit having its upper end open to the atmosphere for the intake of air and its lower end offset to one side of the body of the conduit and opening upwardly into the container for the upward discharge

of air into the same, and a vertical tube located alongside of the conduit and extending down into the body of oil in the container, the upper end of the tube extending above the oil level in the container and open to the engine suction, the lower end of the tube terminating close to the upwardly opening discharge end of the conduit, and in substantial alignment therewith to receive the discharge from the conduit.

3. An automatic lubricator for internal combustion engines, comprising a container made in two sections, a lower or body section of glass and an upper or cap section of metal with a releasable connection between them, said body section composing the greater portion of the container and holding substantially the entire oil supply therefor, an air intake conduit in the container and extending down into the same from said cap section, said conduit having its upper end opening into the atmosphere through the cap section, a valve at the lower end of said conduit to control the passage of air therefrom into the container, means at the cap section whereby the container may be connected with the suction side of the engine, a vertical tube interposed between the suction connection of the container and the valve with the ends of the tube located in close proximity to the suction connection and valve respectively, and means for supporting said tube on the cap section of the container.

4. An automatic lubricator for internal combustion engines, comprising a container containing a body of oil, means for connecting the interior of the container above the oil level therein with the suction side of the engine, a conduit located within the container and extending down into the body of oil therein, said conduit having its upper end open to the atmosphere for the intake of air and its lower end opening into the container for the discharge of air into the same, valve means normally closing the discharge end of the conduit and automatically opening under the suction effort of the engine, and a vertical tube interposed between the suction connection of the container and the valve with the ends of the tube located in close proximity to the suction connection and valve respectively, the lower end of the tube being flared downwardly and disposed directly above the valve.

5. An automatic lubricator for internal combustion engines, comprising a container made in two sections, a lower or body section and an upper or cap section with a releasable connection between them, said body section comprising the greater portion of the container and holding substantially the entire oil supply therefor, said cap section having a pair of passages therein, both opening into the interior of the container above the level of the oil therein, with one passage adapted for connection to the suction side of the engine, an air intake conduit in the container and extending down into the body of the oil therein from the cap section, said conduit having its upper end connected with the cap section at the air intake passage, the lower end of the conduit being offset to one side of the body of the conduit and opening upwardly into the container for the upward discharge of air into the same, and a tube supported in the container alongside of the conduit, the upper end of the tube extending above the oil level in the container and opening up into the cap section for connection with the suction passage in the cap section, the lower end of the tube extending toward the lower end of the conduit and located above the upwardly opening discharge end thereof to receive the discharge from the conduit.

In witness whereof, I hereunto subscribe my name to this specification.

ELMER RYDER.