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AUTOMATIC SIGNAL APPARATUS TO INDICATE FAILURE OF LUBRICATING SYSTEMS.

APPLICATION FILED DEC. 9, 1916.

1,312,097. Patented Aug. 5, 1919.

Fig. 1.

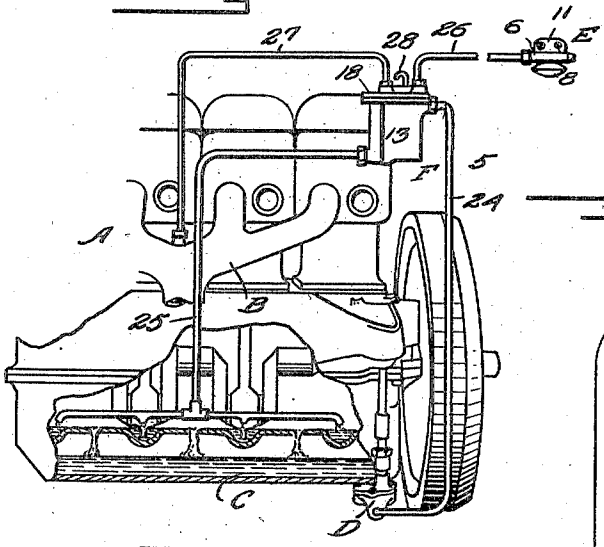


Fig. 3

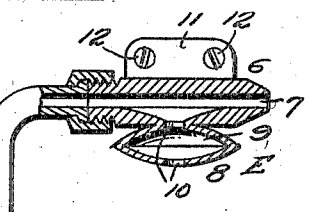


Fig. 2

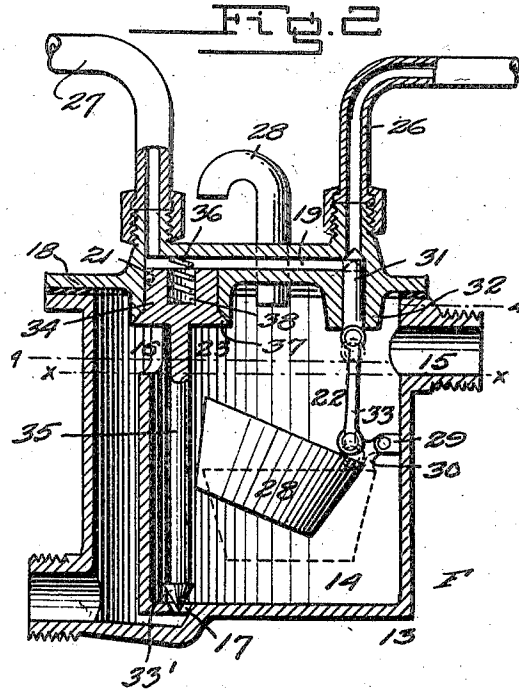
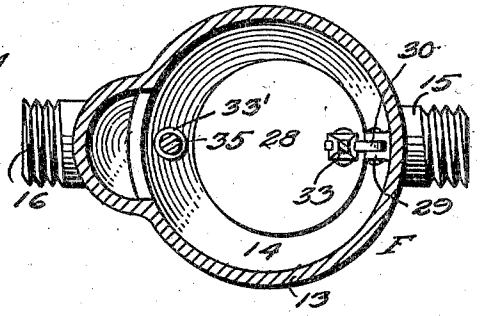


Fig. 4.



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AUTOMATIC SIGNAL APPARATUS TO INDICATE FAILURE OF LUBRICATING SYSTEMS.

1,312,097. Specification of Letters Patent. Patented Aug. 5, 1919.

Application filed December 9, 1916. Serial No. 136,003.

To all whom it may concern:

Be it known that we, LEVI GASTON BUCKNER and SAMUEL JAMES SIBLEY, citizens of the United States, and residing at Memphis, in the county of Shelby and State of Tennessee, have invented certain new and useful Improvements in Automatic Signal Apparatus to Indicate Failure of Lubricating Systems, of which the following is a specification.

Our present invention relates to lubricating systems for engines, and more particularly to signal apparatus for such systems automatically operated, should the systems fail.

The principal objects of our invention are to provide signal apparatus which may be readily installed in operative relation to existing lubricating systems or applied to new systems, so that a signal, such as a whistle, will be blown, should the systems fail; signals which are operable by the partial vacuum created in the intake manifold or pipe during operation of an internal combustion engine; and, signal apparatus which will operate to give warning should there be insufficient oil in the systems, an obstruction in the main ways of the systems, or should the pump break where a force feed system is used.

Other objects of our invention will appear in the following detailed description, taken in connection with the accompanying drawing, forming a part of this specification, and in which drawing:—

Figure 1 is a fragmentary perspective view of an internal combustion engine equipped with a lubricating system embodying our invention, parts of the said engine being broken away and shown in section to disclose details.

Fig. 2 is a view in central vertical section through a control device of the signal apparatus, parts being shown in elevation to simplify the view.

Fig. 3 is a view in central vertical section through the signal device, and showing a pipe in operative relation thereto.

Fig. 4 is a sectional view on the line 4—4 of Fig. 2.

In the drawing, where similar characters refer to similar parts throughout the several views, A designates an internal combustion engine including an intake manifold B and an oil sump C; D a pump operated by engine A and having its ingress in communication with sump C; E a signal device of the signal apparatus, in the example shown, of the audible type; and, F a control device of the apparatus.

While we have herein shown the invention as applied to the lubricating system of an internal combustion engine, it is to be understood that the invention may be applied to lubricating systems which supply oil to engines of any type requiring a circulation of oil when operated. In the example shown, it is to be understood that, when the engine is operated, air is drawn through the manifold B and, because of the resistance to movement, as through the carbureter, (not shown in the drawing), a partial vacuum is created within the manifold. Also, while we have shown in the present example, a pump D for circulating the oil, it is to be understood that the invention may be applied to gravity supply lubricating systems, without departing from the spirit of our invention.

As shown in Fig. 1 of the drawing, the system includes a conductor 5 for conveying the oil from the source of supply, in the present example, the oil sump C, to various parts of the engine requiring lubrication.

Referring now to the signal device E, it may be disposed at any convenient place, such as on the dash of a motor vehicle, and by way of example, comprises a main body 6, cylindrical in shape, and provided with a longitudinal way 7 for air; a disk-like member 8 provided with a hollow 9 and co-axial perforations 10, when air is drawn through the member 8 producing a whistling sound; and, a bracket 11 extending from body 6, through which screws 12 may be passed to secure the device E at the position desired.

As to the control device F, it comprises a main body 13, providing a chamber 14 for oil, an ingress way 15 thereto, an egress way 16 open at the upper portion of chamber 14, and a gravity by-pass 17 between the chamber 14 and way 16; cap 18 for body 13, said cap provided with a port 19 for air and a guideway 21 open to port 19 and chamber 14; means 22 for setting off the signal E operable by low oil in chamber 14; and, a valve device 23 for controlling by-pass 17 and operable to an open position by suction in port 19.

In assembling the control device F in

operative relation with the lubricating system, it is disposed in the main conductor thereof and in the example shown in the drawings, the egress from pump D is in communication with the ingress way 15 of device 13, through pipe 24, while the egress way 16 is in communication with portions of the engine A to be lubricated, as by pipe 25. The port 19 may be placed in communication with the way 7 of signal device E, as by pipe 26, while port 19 may also be disposed in communication with the intake manifold, as by pipe 27. If desired, a vent 28 may be provided, carried by cap 18, the way of said vent being in communication with chamber 14 and provides an egress for air when the system is first brought into use. The means 22 may comprise a float 28 in chamber 14 pivotally supported at one end portion from bearing 29 rigid with body 13, through a link 30; a valve 31 reciprocable in bearing 32 in cap 18; and, a link 33 pivotally connected with link 30 and valve 31, as is clearly shown in Fig. 2 of the drawing. The device 23 may comprise a valve 33′ adapted to seat itself in by-pass 17; a piston 34 reciprocable in guideway 21; a rod 35 connecting piston 34 and valve 33′; and, a spring 36 acting upon piston 34 to normally seat valve 33′. Movement of the piston 34 may be limited in one direction as by being provided with a flange 37 adapted to engage the cap 18. The spring 36 may be accommodated in a recess 38 formed in the upper portion of the piston, said spring also engaging the cap 18 and as clearly shown in Fig. 2 of the drawing.

The operation of the apparatus is as follows:—

Assuming that the engine and lubricating system is operating, there will be oil in chamber 14 with its upper surface at or above the line *x*—*x* in Fig. 2, which raises the float 28 to the position shown in full lines in said figure, closing off communication between port 19 and the signal device E. Inasmuch as the suction created in the manifold B influences piston 34, it will be drawn so as to unseat valve 33′. Thus the oil may find egress from the chamber 14 mainly through way 16, but also through by-pass 17, and through pipe 25 to those portions of the engine requiring lubrication. Should the lubricating system fail, as through lack of oil, an obstruction in the conductor 5, or the breakage of pump D, oil will fail to flow through way 16, and will become low in chamber 14, finding egress through by-pass 17, this being with the assumption that the engine A is operating. As soon as there is an insufficient quantity of oil in chamber 14 to hold up float 28, the latter will drop and open communication between port 19 and signal device E. The engine A will therefore draw a portion of its air during intake strokes through the perforations 10 of the whistle 8, and the operator will be notified as through the audible signal, that the lubricating system is not operating.

It is to be observed that when the engine A is inert, the valve 33′, responsive to action of the spring 36 on piston 34 will close the by-pass 17 so that there will be no gravity flow of oil from chamber 14, when the engine A is not in use. This prevents the control device F from setting off signal device E except when the lubricating system fails during operation of the engine A.

Changes in details may be made without departing from the spirit or scope of our invention; but

We claim:—

1. In a lubricating system, the combination with an engine, of a signal operable by fluid in motion, a conductor for conveying oil to said engine, and a control device in said conductor operable by low oil in said device, to permit fluid actuated by said engine to operate said signal.

2. In a lubricating system, the combination with an internal combustion engine including an intake pipe, of a signal operable by fluid in motion, a conductor for conveying oil to said engine, and a control device in said conductor operable by low oil in said device, to cause suction from said intake pipe to operate said signal.

3. In a lubricating system, the combination with an engine, and a pump operated thereby, of a signal operable by fluid in motion, a conductor in operative relation to said pump and said engine to convey oil to the latter, and a control device in said conductor operable by low oil in said device, to permit fluid actuated by said engine to operate said signal.

4. In a lubricating system, the combination with an internal combustion engine including an intake pipe and an oil sump, of a pump with its egress in communication with said oil pump, a signal operable by fluid in motion, a conductor in operative relation to said pump to circulate oil for lubricating said engine, and a control device in said conductor operable by low oil in said device, to permit suction from said intake pipe to operate said signal.

5. In signal apparatus for lubricating systems, the combination of a signal mechanism, a body providing a chamber for oil, an ingress way thereto, an egress way open at the upper portion of said chamber, and a gravity by-pass in communication with said last mentioned way and said chamber, means for setting off said signal, mechanism, operable by low oil in said chamber, and a valve device for closing said by-pass but operable to an open position by suction.

6. In signal apparatus, for lubricating

systems, the combination of a signal mechanism, a body providing a chamber for oil, an ingress way thereto, an egress way open at the upper portion of said chamber, and a gravity by-pass in communication with said last mentioned way and chamber, means for setting off said signal mechanism, operable by low oil in said chamber, a cap for said body provided with a port for air and a guideway open to said port and chamber, a valve for said by-pass, a piston in said guideway and operatively connected with said valve to open said by-pass when said piston is drawn toward said port and a spring for forcing said piston to move said valve to a position closing said by-pass.

7. In signal apparatus for lubricating systems, the combination of a signal mechanism, a body providing a chamber for oil, an ingress way thereto, an egress way open at the upper portion of said chamber, and a gravity by-pass in communication with said last mentioned way and chamber, means for setting off said signal mechanism operable by low oil in said chamber, a cap for said body provided with a port for air and a guideway open to said port and chamber, a valve for said by-pass, and a piston in said guideway and operatively connected with said valve to open said by-pass when said piston is drawn toward said port.

8. In signal apparatus for lubricating systems, the combination of a whistle, a body providing a chamber for oil, an ingress way thereto, an egress way open at the upper portion of said chamber and a gravity by-pass in communication with said last mentioned way and chamber, a cap for said body provided with a port for air, said port in operative relation to said whistle, a float in said chamber, a valve for controlling said port and operatively connected with said float to close said port when said float is raised, and open said port when said float is lowered, and a valve device for closing said by-pass but operated to open said by-pass by suction in said port.

9. In signal apparatus for lubricating systems, the combination of a whistle, a body providing a chamber for oil, an ingress way thereto, an egress way open at the upper portion of said chamber and a gravity by-pass in communication with last mentioned way and chamber, a cap for said body provided with a port for air, said port in operative relation to said whistle, and provided with a guideway open to said chamber of said body, a float in said chamber of said body, a valve for controlling said port and operatively connected with said float to close said port from said whistle when said float is raised, and open said port to said whistle when said float is lowered, a valve for said by-pass, a piston in said guideway and operatively connected with said last mentioned valve to open said by-pass when said piston is drawn toward said port, and a spring for normally forcing said piston to move said second mentioned valve to a position closing said by-pass.

10. In combination with the cylinders of a gas engine and the crank case thereof, a float chamber in communication with the crank case, a pipe for connecting the float chamber and engine, a head forming a part of the pipe, a signaling device comprising a whistle in communication with the head, a float actuated valve for controlling the passage of air through said whistle and pipe, the passage of air through said whistle and pipe being created by the suction of the piston within the cylinders of the engine.

11. In combination with the cylinders of a gas engine, a signaling device comprising a whistle in communication with said cylinders, float-actuated means for controlling the passage of air through said whistle, said cylinders adapted to create a suction through the whistle when the float-actuated means is in one position.

12. In combination with the crank case of a gas engine, a signaling device comprising a whistle, a head for supporting the whistle, a valve seat within the head, means for connecting the head to the engine cylinders, a valve adapted to seat on said valve seat for cutting off communication between the whistle and cylinders, and automatic means for unseating the valve, thereby allowing the engine cylinders to draw air through the whistle for sounding the same.

13. An indicator for low liquid levels, comprising in combination, an indicating device, a conduit connecting said device and a source of reduced air pressure, and a valve in said conduit controlled by the liquid, substantially as described.

14. Indicating means for liquid levels, comprising in combination, an indicator, a conduit connecting the same to a source of vacuum such as the intake conduit of an engine, and means controlled by the liquid level and acting as a valve for opening and closing said conduit, substantially as described.

15. Indicating means for liquid levels, comprising in combination, a fluid pressure indicator, a conduit connecting the same to a source of vacuum, and a valve actuated by the liquid for permitting said vacuum to actuate said indicator, substantially as described.

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