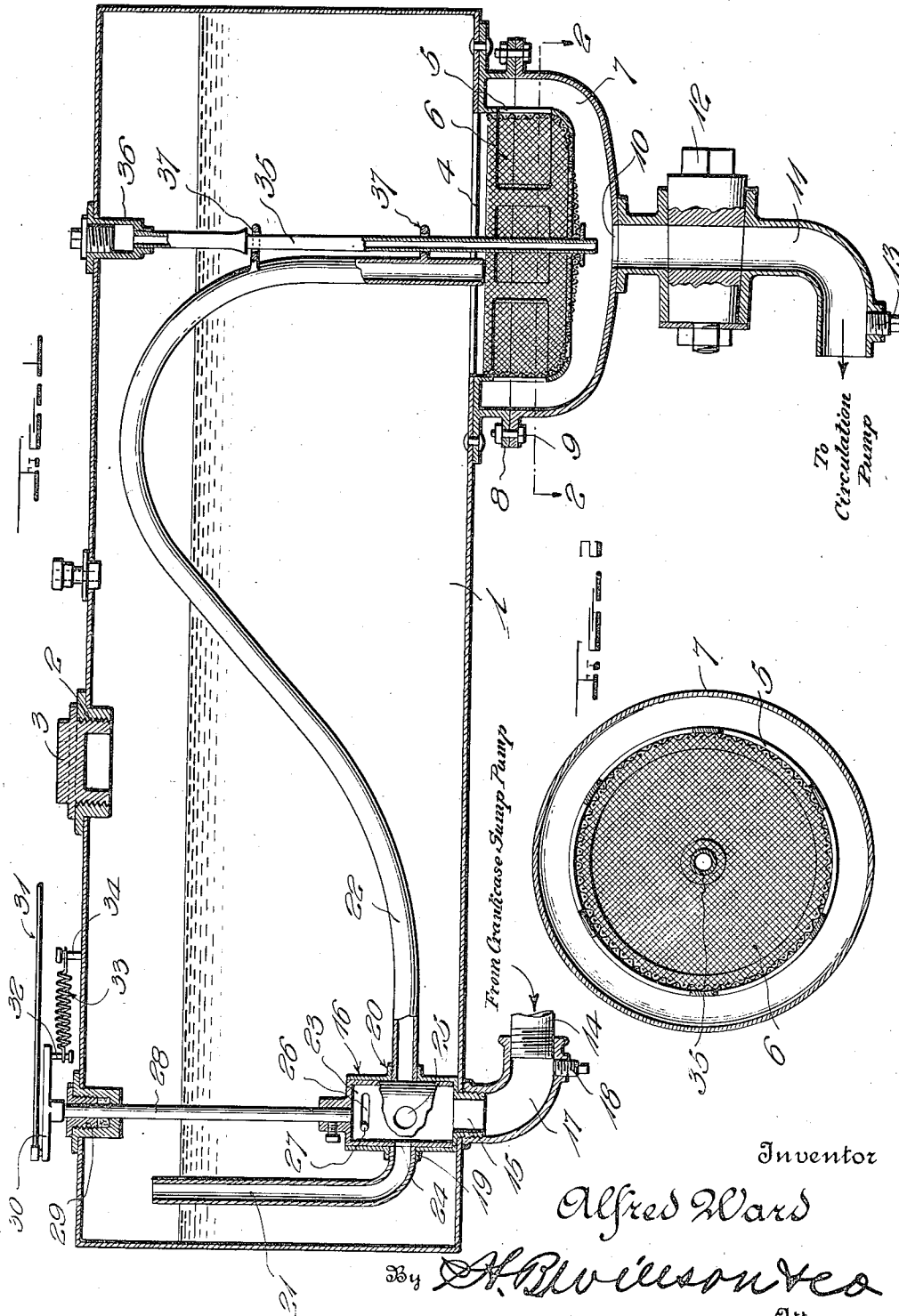


A. WARD.
LUBRICATING SYSTEM.
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LUBRICATING SYSTEM.

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To all whom it may concern:

Be it known that I, ALFRED WARD, a citizen of the United States, residing at Queens St., St. Albans, Long Island, in the county of Queens and State of New York, have invented certain new and useful Improvements in Lubricating Systems; and I do declare the following to be a full, clear and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improved lubricating system for use in connection with an internal combustion engine and one object of the invention is to provide an improved construction of reservoir tank by means of which warm oil may be passed through the reservoir tank into the pipe leading to the circulating pump.

Another object of the invention is to so construct this improved lubricating system that warm oil may be caused to pass through a conductor pipe in the reservoir and fed directly to a straining screen at the upper end of the pipe leading to the circulating pump thus permitting a circulation of warm oil while the oil which has thickened in the reservoir tank is becoming heated and thinned.

Another object of this invention is to so construct this lubricating system that the oil from the crank case sump pump may be caused to flow either through the conductor pipe leading to the strainer or may be caused to flow through a pipe having communication with the interior of the reservoir and thus the oil permitted to be deposited either directly into the strainer or into the reservoir.

Another object of the invention is to so construct this lubricating system that it is only necessary to provide the reservoir tank with an improved construction in order to permit a conventional construction of lubricating system to be easily converted into the improved construction.

This invention is illustrated in the accompanying drawings wherein:

Figure 1 is a view showing a reservoir tank in longitudinal section.

Fig. 2 is a transverse sectional view taken along the line 2—2 of Fig. 1.

The lubricating system of an internal combustion engine includes a reservoir tank 1 in

which lubricating oil will be poured through an inlet 2 closed by a removable cap 3. This reservoir is provided with an outlet opening 4 and a skeleton frame 5 is secured to the bottom of the reservoir beneath and about the opening 4 and carries a cup 6 which is formed of screening and forms a strainer for the oil which passes through the outlet 4 of the reservoir. A cup 7 is connected with the flange 8 of the skeleton frame 5 by bolts or other removable fasteners 9 and is provided with an outlet 10 through which oil will pass into the neck of the pipe 11 which leads to the circulating pump. This pipe is provided with a valve 12 by means of which the flow of oil from the cup 7 may be shut off when desired and is further provided with a plug 13 which may be removed when it is desired to drain the pipe 11 with the valve 12 closed.

The oil after it has been pumped to the various bearings of the motor through suitable conductor pipes passes down into the sump of the crank casing and from the crank casing it passes through a pipe to a pump which is known as the crank case sump pump. This pump draws the oil from the crank case sump and pumps it through a pipe 14 which is connected with the neck of a valve housing 16 by means of an elbow 17. This elbow carries a plug 18 similar to the plug 13 so that the plug 18 may be removed for draining when desired. In a system of the usual type the pipe 14 is connected with a pipe which extends up into the reservoir 1 to a point above the oil level and the oil is therefore emptied directly into the reservoir. After the oil has been in use with the motor running and the motor is shut off for the night the oil will cool and on a cold night will thicken. Therefore when the motor is again started the bearings will not be properly lubricated as the oil which has thickened will not flow properly. Therefore the bearings will become overheated and damaged whereas if warm oil were fed to the circulating pump when the motor is first started this oil could circulate through the lubricating system and provide the proper lubrication while the oil in the reservoir is becoming heated and thinned.

In order to accomplish this the valve housing 16 has been provided, the valve housing being provided with outlet necks 19 and 20

from which extend pipes 21 and 22. The shell valve 23 which is rotatably mounted in the housing 16 is provided with outlet openings 24 and 25 for registering respectively with the outlets 19 and 20 and this valve is provided with a slot 26 through which extends a pin 27 to limit rotary movement of the valve in the housing. It will thus be seen that the valve may be rotated through the medium of the stem 28 which extends up through the packing gland 29 in the top of the reservoir and will permit passage of the oil from the pipe 14 selectively into the pipes 21 and 22 according to the position of the valve 23. This stem 28 is provided at its upper end with a cross head 30 which has one end engaged by an actuating rod 31 and at its second end is provided with a pin 32 engaged by a spring 33. This spring 33 engages a pin 34 carried by the reservoir and will serve to normally retain the valve in the position shown for directing the oil from the pipe 14 into the pipe 21 and through this pipe into the reservoir.

After the motor has been idle for some time and the oil in the reservoir has become thickened it is desired to feed warm oil into the pipe 11 and in order to do so there has been provided a pipe 35 which extends vertically in the reservoir from the cup 36 through eyes 37 carried by the pipe 22 and down through the strainer 6 into the lower portion of the cup 7 above the outlet 10 thereof. The warm oil can thus be forced from a grease gun through the pipe 35 into the pipe 11 and will flow from this pipe to the circulating pump which will force it through the lubricating system. This warm oil will pass through the pipe 14 and with the two-way valve turned to bring the port 25 into registry with the pipe 22 the oil will flow through this pipe 22 and back into the strainer. The warm oil will tend to heat the thick oil in the strainer and cup as it flows through the strainer and back into the pipe 11 and the passage of the oil through the pipe 22 will heat this pipe and the oil in the reservoir will be gradually heated. After the oil in the reservoir has been heated to a sufficient extent the valve may be turned to the position shown in Fig. 1 and the oil will flow through the pipe 21 back into the reservoir instead of passing through the pipe 22. When the motor is shut off for the night the valve 12 will be closed and the plugs 13 and 18 removed. The oil which drains out when these plugs are removed will be caught in a thermos bottle or other receptacle in which it can be kept warm and this warm oil will be put away until the motor is again to be used at which time it will be poured into the grease gun and forced into the pipe 35 as previously stated. It will thus be seen that there has been provided an improved

construction of lubricating system by means of which the warm oil may be supplied to the lubricating systems when the motor is first started and by means of which the warm oil may be led through the reservoir tank and back to a point close to the outlet of the tank where it will serve to heat and thin the oil in the tank. It will be further seen that there has been provided a system so constructed that a conventional construction of lubricating system may be easily converted into the improved system.

What is claimed is:

1. An oil reservoir having an inlet and an outlet, a strainer for oil passing through the outlet, a two-way valve at the inlet having an outlet directing oil into the reservoir, a conductor pipe leading from the second outlet of the valve to a point adjacent the strainer, a cup inclosing the strainer and outlet of the reservoir and having an outlet, and a pipe extending through the reservoir and outlet thereof and through the strainer into the cup to a point adjacent the outlet of the cup.
2. A lubricating system oil reservoir having an inlet and an outlet, a strainer for the outlet, a cup inclosing the outlet and strainer and having an outlet, a conduit for conducting oil from the inlet through the outlet of the reservoir to a point adjacent strainer, and a conduit for conducting oil through the reservoir and strainer into the cup.
3. A lubricating system oil reservoir having an inlet and an outlet, a skeleton frame connected with the reservoir about the outlet, a strainer carried by the frame, a cup carried by the frame and inclosing the strainer carrying portion thereof and having an outlet, and a conduit pipe having valve controlled communication with the inlet of the reservoir and extending through the reservoir and strainer into said cup.
4. A lubricating system oil reservoir having an inlet and an outlet, a screen at the outlet, a valve controlled conduit for selectively returning oil from a circulating system to the reservoir and for conducting the oil through the reservoir from the inlet to the outlet, and a conduit for conducting a priming charge of oil through the reservoir and through the outlet thereof and through the screen.
5. A lubricating system oil reservoir having an inlet and an outlet, a conduit for conducting warm oil through the reservoir from the inlet to the outlet and serving as means for heating oil in the reservoir, a two-way valve for the conduit provided with an actuating stem extending externally of the reservoir, operating means connected with the outer end portion of the stem, and means yieldably retaining the valve in a set position.

6. A lubricating system oil reservoir having an inlet and an outlet, means for conducting a priming charge of heated oil through the reservoir to the outlet, and
5 means for conducting warm oil from the lubricating system through the reservoir from the inlet to the outlet.

7. A lubricating system oil reservoir having an inlet and an outlet, and means for conducting a priming charge of heated oil 10 through the reservoir to the outlet.

In testimony whereof I have hereunto set my hand.

ALFRED WARD.