R. HUFF.

LUBRICATING SYSTEM FOR MOTORS.

APPLICATION FILED DEC. 14, 1911.

1,024,727. Patented Apr. 30, 1912.

Fig. 1.

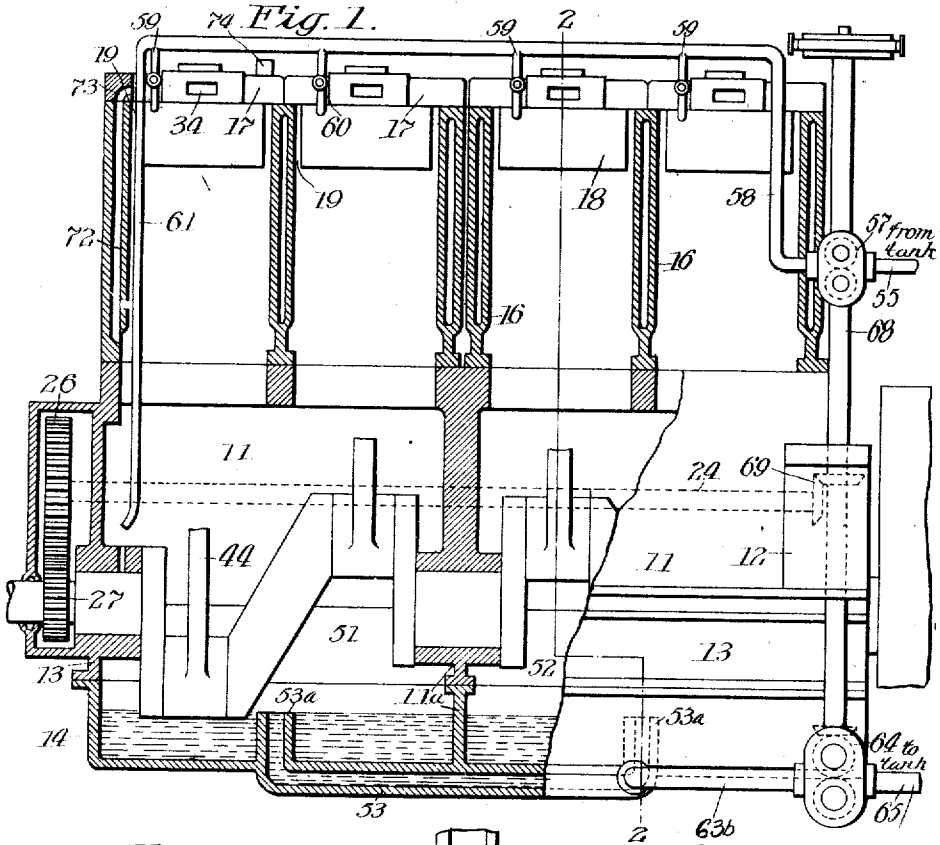
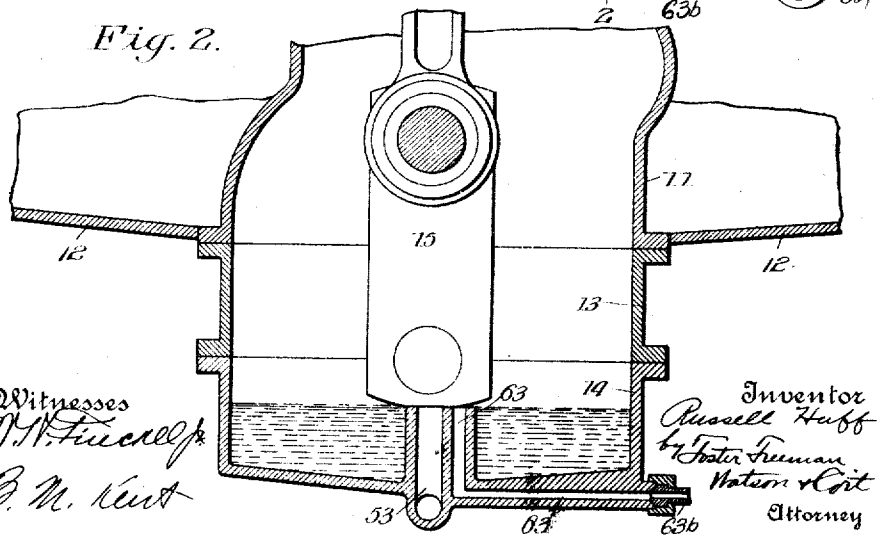


Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

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LUBRICATING SYSTEM FOR MOTORS.

1,024,727. Specification of Letters Patent. Patented Apr. 30, 1912.

Original application filed July 2, 1909, Serial No. 505,735. Divided and this application filed December 14, 1911. Serial No. 665,700.

To all whom it may concern:

Be it known that I, RUSSELL HUFF, a citizen of the United States, and resident of Detroit, Wayne county, State of Michigan, have invented certain new and useful Improvements in Lubricating Systems for Motors, of which the following is a specification.

This application is a division of my application, Serial Number 505,735, filed July 2nd 1909.

This invention relates to oiling systems, and in particular to oiling systems for motors used for propelling vehicles.

In multi-cylinder motors used in motor vehicles the cylinders are usually arranged vertically and in line and bolted separately or in pairs to a single crank case, which case is usually divided into compartments forming oil wells into which the cranks dip to splash the oil over the working parts of the motor. It is necessary that a sufficient supply of oil be maintained in the crank case compartments and it is desirable that the oil be kept at a constant and uniform level in all the compartments which is somewhat difficult to effect when the vehicle is on an incline as when going up or down hill.

The object of this invention is to provide an oiling system to maintain the oil in the various compartments at a uniform and constant level.

One of the features of this invention, broadly considered, consists in dividing the crank case into front and rear compartments and connecting these compartments by an equalizing duct terminating in risers extending into the oil wells and opening at substantially the normal oil level therein.

Another feature of this invention consists in a supply and discharge means for maintaining the oil in the compartments at a fixed level.

Broadly stated, it consists of means for supplying the oil to the crank case at a rate slightly in excess of what can be used by the motor and of means for withdrawing oil from the crank case when the level therein rises above the predetermined normal oil level. These means preferably consist of a small constantly driven pump which supplies the oil from a reservoir to the crank case and of a discharge pump having a capacity slightly in excess of the feeding pump and connected with an outlet pipe which opens into the oil well of one or both of the compartments at substantially the normal oil level. Said discharge pump preferably discharges into the reservoir whereby the oil is kept in constant circulation.

In the drawings: Figure 1 is a vertical longitudinal section partly in elevation through the crank case and cylinders; Fig. 2 is a partial transverse section on the line 2—2 of Fig. 1.

Referring to the drawings, 11 designates the upper section of the crank case provided with integral side arms 12 for supporting the engine structure from the side bars of a motor vehicle, 13 the intermediate section, and 14 the lower section of the crank case. The crank shaft 15 is journaled in bearings between the sections 13 and 11. All of the sections are bolted together in a manner well understood by those skilled in the art.

The cylinders 16 are bolted to the crank case. These cylinders in the construction shown are cast in pairs. Each cylinder is provided with a cylinder head 17, provided with a downwardly extended portion 18 of smaller diameter than the internal diameter of the cylinder, thereby forming an annular space or chamber 19. The downwardly projecting portion 18 is provided with the usual packing rings, (not shown).

The lower section of the crank case is divided by a partition 11^a into compartments 51, 52, forming oil wells or pockets. An equalizing conduit 53 connects these compartments and terminates in risers 53^a, opening into the pockets at the normal oil level.

An oil tank (not shown) is connected by the pipe 55 to the feeding pump 57. A pipe 58 leads from the pump 57, and is connected by branch pipes 59 to the annular chambers or cavities 19, formed between the cylinder head and the cylinder. Hand valves 60 are provided whereby the supply to the separate cylinders may be independently controlled or cut off. An overflow pipe 61 discharges into the crank case.

A riser or stand pipe 63 communicates with an outlet conduit 63^a which connects with a pipe 63^b leading to a discharge pump 64, which discharges through a pipe 65 into the oil supply tank. The riser or stand pipe 63 opens into the compartment 52 at substantially the normal oil level therein, and

is preferably placed alongside of one of the risers 53ª. In the construction shown the duct 53, its risers 53ª, the riser 63 and the outlet pipe 63ª are cast integrally with section 14 of the crank case.

The pumps 57 and 64 are preferably of the gear type, and are driven through a common shaft 68, which may be the commutator shaft, through gears 69 from the valve shaft 24. The capacity of the pump 64 is slightly in excess of that of 57. This may be accomplished by making 64 larger than 57 or by driving 64 at a higher rate of speed than 57. In this way it is insured that the oil in the compartment 52 will remain at a constant level, and since the pump 57 feeds the oil in excess of the rate at which it is used, the level of the oil will never drop below the level of the risers. The conduit 53 connecting the compartments will insure that the level of the oil will remain the same in both compartments, and even when the vehicle is on an incline, as when going up hill, the construction of the risers 53ª will prevent all the oil in one compartment from flowing into the adjacent one.

Referring to Fig. 1, the cylinder wall is provided with a vertical channel 72 communicating with the crank casing, and an alined channel 73 formed in the cylinder head communicates at one side of the cylinder head with the annular chamber 19. The vent 74 opens into the annular chamber 19 at a point opposite the opening of the channel 73. The oil kicked up by the cranks will pass up through channel 72, aided by the gases in the crank casing which pass up through chamber 19 and out of the vent 74. The oil passing up 72 will enter into the chamber 19 and lubricate the cylinder head and walls, while the gases will escape through the vent 74. The channel 72 in the construction shown is formed in the cylinder walls. It is obvious, however, that this may be a separate pipe located on the outside of the cylinder.

Various changes may be made in the details of construction without departing from the spirit of this invention as defined in the appended claims, and it is to be understood therefore that this invention is not to be limited to the specific construction shown.

What I claim is:

1. In an oiling system, the combination with a casing comprising a plurality of compartments forming oil pockets, of an equalizing conduit connecting the pockets, means for supplying oil to the pockets, and a discharge outlet opening into one of the pockets at the normal oil level.

2. In an oiling system, the combination with a casing comprising a plurality of compartments forming oil pockets, of an equalizing conduit connecting the pockets, an oil supply, a pump supplying oil from the supply to the pockets, a discharge outlet opening into one of the pockets at the normal oil level, and a pump connecting the outlet and the supply.

3. In an engine, a crank case section constructed to form a plurality of oil pockets, an equalizing conduit connecting the pockets and terminating in risers, a discharge outlet terminating in a riser located adjacent one of the risers, said conduit and risers being cast integrally with the body of the section.

4. In an engine, a crank case section constructed to form a plurality of oil pockets, an equalizing conduit connecting the pockets and terminating in risers, a discharge outlet terminating in a riser, said conduit and risers being integral with the body of the section.

5. In an engine, a crank case constructed to form a plurality of oil pockets, an equalizing conduit connecting the pockets and terminating in risers having openings at their upper ends, said risers being spaced from the sides and ends of the compartments, and a discharge outlet opening into one of the compartments beside the riser and at substantially the level of the opening in the riser, for the purpose described.

6. In an engine, a crank case section constructed to form a plurality of oil pockets, an equalizing conduit connecting the pockets and terminating in risers having openings into the compartments, said conduit and risers being formed integral with the crank case section, and an outlet from one of the compartments at substantially the same level as the riser opening.

In testimony whereof I affix my signature in the presence of two witnesses.

RUSSELL HUFF.

Witnesses:
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