H. K. KING.

AUTOMATIC OILING DEVICE.

APPLICATION FILED NOV. 26, 1912.

1,122,607. Patented Dec. 29, 1914.

Fig. 1.

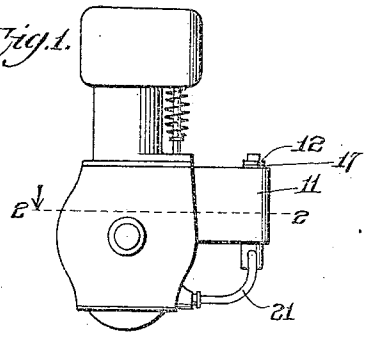


Fig. 2.

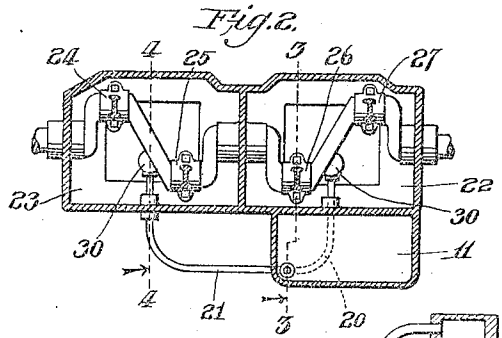


Fig. 3.

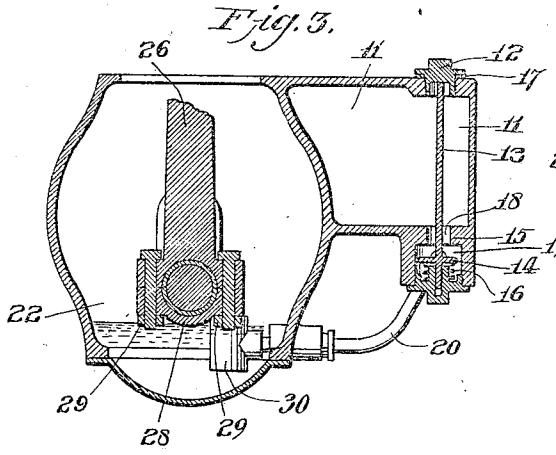


Fig. 7.

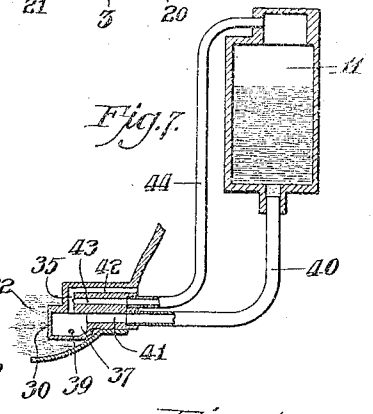


Fig. 6.

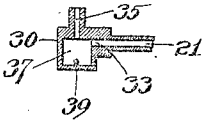


Fig. 6.

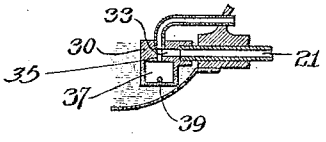
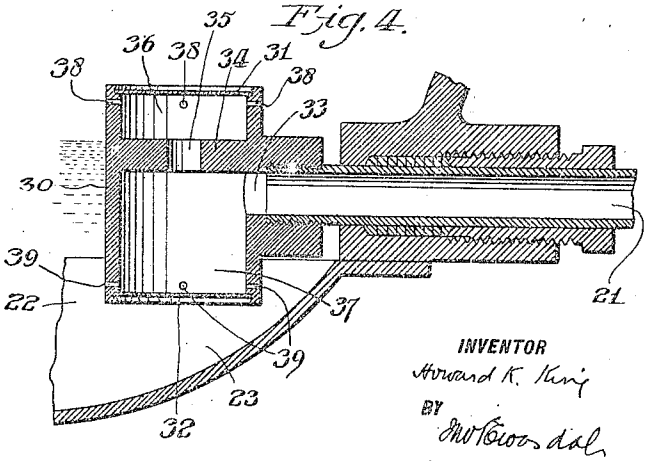


Fig. 4.



WITNESSES:

Mae Hoffmann

Howard S. Okey

INVENTOR

Howard K. King

BY

Mortimer Brooks dale

ATTORNEY.

UNITED STATES PATENT OFFICE.

HOWARD K. KING, OF PHILADELPHIA, PENNSYLVANIA.

AUTOMATIC OILING DEVICE.

1,122,607. Specification of Letters Patent. Patented Dec. 29, 1914.

Application filed November 26, 1912. Serial No. 733,591.

To all whom it may concern:

Be it known that I, HOWARD K. KING, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia, State of Pennsylvania, have invented a new and useful Automatic Oiling Device, of which the following is a specification.

My invention relates to improvements in methods and means for automatic oiling.

The object is to provide an improved method and means for the automatic control of the feed of lubricating oil such as, for example, to the crank cases of engines. The invention is especially applicable for use in connection with internal combustion engines of motor cars.

My invention comprises improvements in a system already in use. The system referred to, comprises means for feeding oil by gravity to the crank cases; the reservoir being located above the normal oil level in the crank case. The lubrication is done by the well known splash system. The ends of the connecting rods 26, and cap 28 held in place by nuts 29, as they pass the lowest center, all dip slightly into the oil. The resulting splash carries oil upwardly, thereby lubricating the cylinder walls and all bearings reached by the splash.

Referring to the drawings which illustrate, merely by way of example, suitable means for effecting my invention—Figure 1 is an end elevation of an internal combustion engine. Fig. 2 is a horizontal section on line 2—2 of Fig. 1. Fig. 3 is a vertical section on line 3—3 of Fig. 2. Fig. 4 is a fragmentary vertical section on enlarged scale on line 4—4 of Fig. 2. Fig. 5 is a sectional detail of a modification of the device shown in Fig. 4 but on a reduced scale. Fig. 6 is a similar view of a further modification. Fig. 7 is a similar view of a still further modification.

Similar numerals refer to similar parts throughout the several views.

Referring to Fig. 3, the oil reservoir 11 is filled with oil by removing the cap 12. When this cap is in place it bears on the valve stem 13 keeping the valve 14 off the seat 15. When the cap 12 is removed the spring 16 causes the valve 14 to close on the seat 15. After the reservoir is filled with oil the cap 12 is screwed tight on the washer 17 making it an air-tight joint. The oil will now flow through opening 18 to the small chamber 19. Pipes 20 and 21 connect this chamber 19 with the crank cases 22 and 23.

By the system above referred to, the pipes 20 and 21 simply project into the crank cases at the desired elevation so that the oil will flow through these pipes into the crank cases until the level of the oil in the crank cases is above the discharge end of pipes 20 and 21. This serves to seal the ends of the pipes against the admission of air to the reservoir 11, thus preventing the further flow of oil from the reservoir until the level of the oil in the crank cases is reduced to permit more air to flow through pipes 20 and 21 to reservoir 11, and thus allow additional oil to flow from reservoir 11, as the same is consumed by the running of the engine. In this way the oil is fed automatically as required so long as there is oil in the reservoir. In practice however, difficulty has been encountered in preventing this system, under certain circumstances from feeding too much oil. This is due to the swash or wave motion of the oil in the crank cases, uncovering the ends of the feed pipes unduly, thus causing an excessive feeding of oil to the crank cases. The amount of wave motion of the oil varies with the speed of the car and with variation of surface of the road over which the car travels. Rough and hilly roads will cause great excess of oil. Excess of oil in the crank cases means excess of oil in the cylinders, and, as is well known, this results in smoke from the exhaust and carbon deposit in the valve chambers and on the valves and cylinder heads and spark plugs. This carbon is very detrimental to the working of the engine. While too much oil is undesirable, an insufficient supply is equally disadvantageous. With insufficient lubrication the fine fitting of the pistons in the cylinders will be quickly destroyed. It is therefore highly desirable that a constant and correct feed of oil to the crank cases should be maintained under all conditions.

To conteract the variations in feed due to excessive variations in the level of oil, caused by the swash and wave motion of the oil in the crank cases above referred to, I provide the following method and means.

At the discharge ends of pipes 20 and 21, and within the crank cases, I secure the chambered body 30. As shown in Fig. 4,

body 30 is provided with a chamber 37 into which the pipe 21 discharges through opening 33. This chamber 37 is provided near the bottom thereof, with a series of discharge apertures 39. At the upper end of chamber 37 is the neck or restricted channel 35 which establishes communication between chamber 37 and chamber 36. Chamber 36 is provided at its upper extension with a series of air holes 38 and between chambers 36 and 37 is a substantial partition or baffle 34. This body 30 is so placed in the crank case that the normal oil level will correspond substantially with the bottom of chamber 36, that is, all of chamber 37 and neck 35 will lie beneath said normal oil level.

With such an arrangement, oil flowing by gravity from reservoir 11, through pipe 21 into chamber 37, is delivered through the apertures 39 to the crank case. The oil passing from the reservoir, is replaced by air, passing through holes 38 in chamber 36, and through neck 35 into chamber 37, and thence through pipe 21 to reservoir 11. Thus the flow of oil from reservoir 11 to chamber 37 and the return of air from pipe 21 to reservoir 11, to take the place of the outflowing oil, is continued until the level of the oil in the crank case is above the level of opening 33, whereupon the opening 33 is entirely sealed by oil against the admission of further air to reservoir 11, and the tendency to vacuum will prevent the further discharge of oil from reservoir 11.

The wave motion of the oil in the crank cases, due to the vibration of the automobile, rapidly changes the level of the oil on the outside of body 30. The oil level in chamber 37 is practically unaffected however by the motion outside the chamber, because of the limited discharge of oil through passages 39, and of the attenuated neck 35. There is practically no wave motion of oil in chamber 37. For best results chamber 37 should have a considerable volume relative to the size or number of the outlets 39. The combined area of the outlets 39 must be sufficient to feed the required amount of oil to the engine.

The local wave motion inside is reduced to a minimum by the baffle plate 34. For best results this baffle plate should be of sufficient thickness, so that chamber 37 in connection with a substantial neck 35 will have the formation similar to that of a bottle.

In Fig. 5 body 30 corresponds even more closely to the shape of a bottle. When the oil is at its working level it extends some distance up the neck. This body 30 when filled with oil as described, will stand considerable shaking without materially agitating the upper surface. The conditions are similar to a bottle filled with liquid to a point just above the neck. The bottle may be moved up and down quite rapidly and the small surface of the liquid will follow the motion of the bottle with but little agitation.

It will be understood that the average level of the oil in the crank cases will be the same as the level in the neck 35. The level of the oil in neck 35 controls the feeding of oil from reservoir 11. As the oil is consumed by the engine, more oil will be fed from the reservoir to take its place. Thus a practically constant supply of oil is provided.

In the arrangements shown in Figs. 4, 5 and 6, pipe 21 serves a double purpose, that of carrying oil downwardly from the reservoir 11, to the chamber 37, and air upwardly to the same reservoir. In Fig. 6, pipe 21 connects the neck 35 entirely above chamber 37. This results in putting the oil chamber 37 deeper below the oil level in the crank case, thus making a greater depth of oil in the neck 35. In the constructions shown in both Figs. 5 and 6, the air communication is direct from neck 35 to the atmosphere.

In Fig. 7 the oil is fed downward from the bottom of the reservoir 11 through pipe 40 and passage 41 to chamber 37. The air enters passage 42 going downwardly in the neck 35, and, when the level of oil permits, enters passage 43, going up passage 44 and delivering entirely above the oil level. It will be understood that in this arrangement, the highest part of passage 43, where it connects with the neck 35, will control the oil level in the crank case.

It will be obvious that my improvement may be applied to any machine having a crank case and having the splash system of lubrication.

What I claim is:—

1. In a splash oiling system for crank cases, a chambered body within the crank case having an oil discharge and an air inlet, a normally air-tight oil reservoir above the chambered body and a conductor connecting the oil reservoir with the chambered body.

2. In a splash oiling system for crank cases, the combination of a chambered body located within the crank case having oil discharge vents and an air inlet, a normally air-tight oil reservoir at an elevation above the chambered body, a conductor leading from the oil reservoir to the chambered body and connecting with the latter at a point intermediate the air inlet and oil discharge.

3. In a splash oiling system for crank cases, the combination of a chambered body located within the crank case having an air passage extending from the top of the chamber and connected with an air supply and having limited oil discharge vents near the bottom of said chamber, a normally air-tight reservoir above the level of the chambered body and a conductor leading from

the reservoir to said chambered body at a point intermediate the air inlet and oil discharge.

4. In a splash oiling system for crank cases, the combination of a chambered body located within the crank case having an air passage extending from the top of the chamber and connected with an air supply and having limited oil discharge vents near the bottom of said chamber, a normally air-tight reservoir above the level of the chambered body, a conductor leading from the reservoir to said chambered body and connecting with the latter at a point intermediate the air inlet and oil discharge, the said chambered body adapted to be normally submerged in oil to the level of the point of connection of the conductor therewith.

5. In a splash oiling system for crank cases, the combination of a chambered body located within the crank case, said body having an oil containing chamber adapted normally to be submerged beneath the oil in the crank case, said chamber having an attenuated passage at its upper side connecting with an air supply, and provided with oil discharge vents near the bottom thereof, an air-tight oil reservoir at an elevation above said oil chamber, and a conductor leading from the reservoir and connecting with said chamber between the air inlet and the oil discharge.

6. In an automatic oiling device, a chambered body having an oil discharge to the crank case and an air inlet, the chambered body being located in close proximity to the vertical plane of the axis of tilt of the crank case, a normally air-tight oil reservoir above the chambered body and a conductor connecting the oil reservoir with the chambered body.

HOWARD K. KING.

Witnesses:
FLORENCE P. TAYLOR,
DUDLEY W. TAYLOR.