

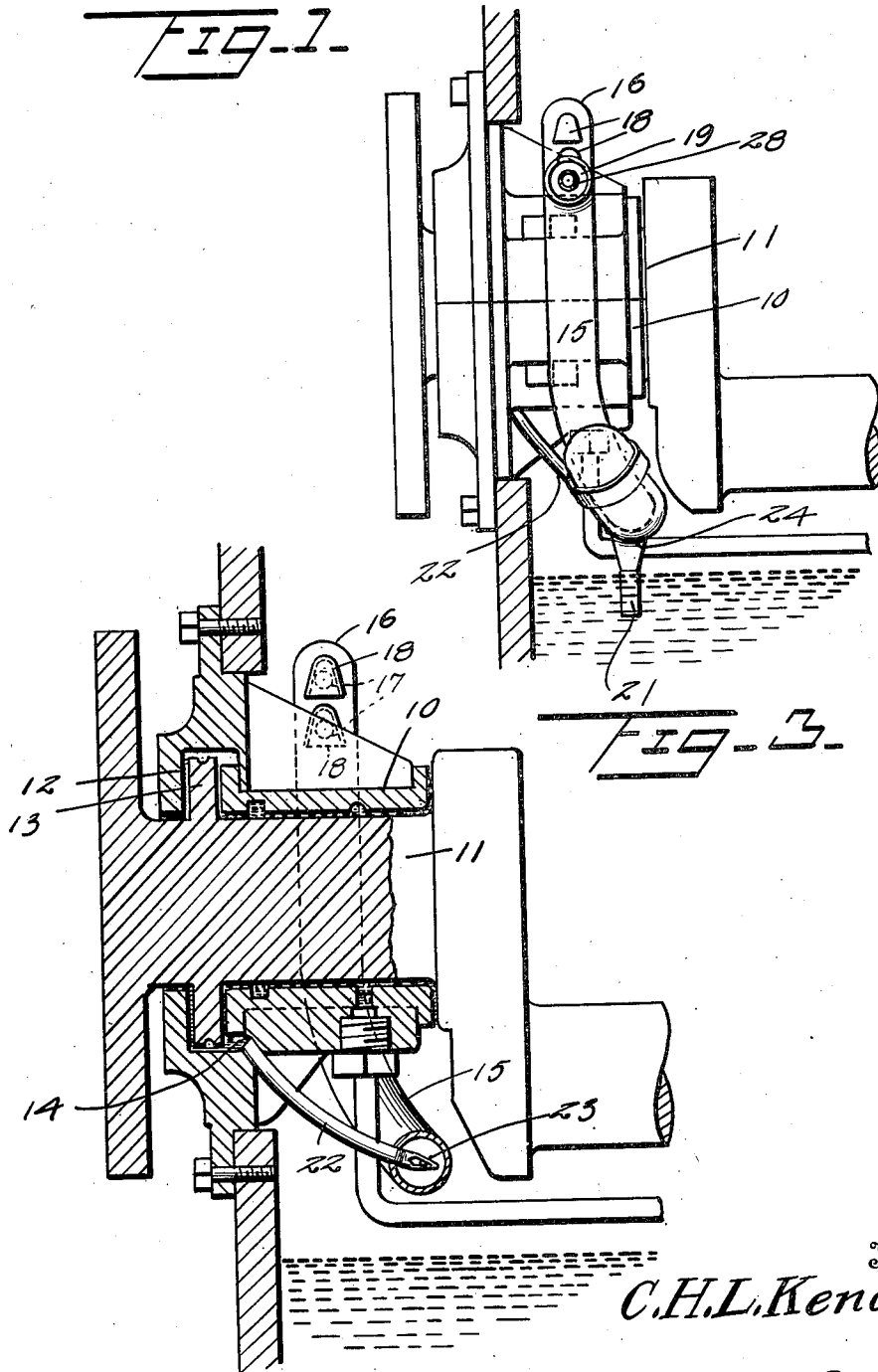
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2 Sheets-Sheet 1



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UNITED STATES PATENT OFFICE.

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INTERNAL-COMBUSTION ENGINE.

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This invention relates to internal combustion engines and more particularly to a means for preventing lubricant losses ordinarily occurring at the end main bearings of the engine.

A further object of the invention is to provide means for positively withdrawing oil from the wells of such bearings so that its capillary loss about the crank shaft from the wells is prevented.

A still further object of the invention is to produce a device of this character which may be very readily installed, is simple and durable in construction and a general improvement in the art.

A further object of the invention is the production of a device of this character which, in addition to performing its function of preventing oil losses, supplies to the carbureter gases withdrawn from the interior of the engine.

A still further object of the invention is the production in a device of this character of a construction such that liquids are removed from the air drawn from the base of the engine before this air is delivered to the carbureter.

These and other objects I attain by the construction shown in the accompanying drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention and wherein:—

Figure 1 is a side elevation of the rear main bearing of the crank shaft of an internal combustion engine showing a lubricant control means applied thereto in accordance with my invention;

Figure 2 is a vertical transverse sectional view through the bearing;

Figure 3 is a section on the line 3—3 of Figure 2;

Figure 4 is an enlarged section on the line 4—4 of Figure 2;

Figure 5 is a section on the line 5—5 of Figure 4;

Figure 6 is a section on the line 6—6 of Figure 4.

Referring now more particularly to the drawings, the numeral 10 generally designates the rear main bearing of a crank shaft and 11 the crank shaft. As is well known to those familiar with the art, in engines where forced lubrication is employed, the outer ends of such bearings are formed with annular grooves 12 and the shaft is formed with a flange 13 operating in this groove, the theory being that oil passing outwardly along the shaft will enter this well from which it may return through a port 14 to the base of the engine. As a matter of fact, while the major portion of the oil will return to the engine through this port, when there is any pressure in the base of the engine, this pressure acting through the port upon the oil tends to cause the same to be forced outwardly upon the shaft so that it escapes. Furthermore, capillary action has a constant tendency to cause oil seepage at this point.

In accordance with my invention, I arrange within the engine base an arcuately curved tube 15, one end of which is closed, as indicated at 16. This tube has openings formed through the wall thereof at 17 adjacent its closed end and these openings are provided with hoods 18 preventing splashed oil from entering the same.

The opposite end of this tube is provided with an angular extension 19 passing through the wall of the base at 20. At its approximate center, the tube is provided with a drain outlet 21 which may be led to the oil sump. A tube 22 has one end thereof connected with the port 14 and the opposite end extended into the tube 15 between the closed end thereof and oil outlet 21 and in close proximity to the latter. The tube 22 within the tube 15 is formed as a jet being V-shaped in cross section and having its apex 23 directed toward the closed end of the tube. The walls of the tube are cut away at this nozzle from the apex 23 with a slanting cut. The diverging walls act to create a vacuum within the tube 22 upon the passage of air or gases through the tube toward the outlet end thereof and thus create suction at the bearing. It will be obvious that apparatus of this character will, of itself prevent the losses which ordinarily occur due to pressure in the base, since this

pressure will enter the openings 17 and pass through the tube to escape from the base, thus creating sufficient suction to prevent loss at the bearing. The oil delivered to the tube 15 by the pipe will pass into a funnel-shaped sump 24 and thus escape to the outlet 21.

To assist in the collection of oil, the outlet tube is extended upwardly through this funnel-shaped sump, so that it projects into the tube 15 and is there provided with a mouth 25 facing the closed end of the tube 15. At the bottom of the sump, the outlet tube 21 has openings 26 for the passage of oil collected in the sump and baffles 27 are preferably provided for directing solids, contained in the gases and air passing through the tube, into the sump. These baffles may be conveniently produced by continuing the lower wall of the tube over the sump and then slotting and bending the same, as more clearly shown in Figure 2.

While the suction afforded by the escape of pressure gas will prove sufficient, in many instances, I preferably provide in combination with the structure just described a tube 28 of considerably smaller diameter than the tube 15 which is extended into the outlet end of the tube at one end and has its opposite end projected into the intake pipe 29 of the carbureter 30 of the engine. The additional suction thus provided not only accelerates movement of the air and gases through the tube 15 but causes a tendency to separation of the heavier from the lighter particles thereof, the lighter particles passing into the tube 28, while the heavier particles, which are mostly oil, will pass down the tube 15 to the sump 24.

Such a device may be readily applied to any make of internal combustion engine as the several tubes employed will occupy but little space and will not interfere in any way with the normal operation of the engine.

It will be obvious that the specific construction hereinbefore set forth is capable of a certain range of change and modification without materially departing from the spirit of the invention and I accordingly do not limit myself to such specific structure except as hereinafter claimed.

I claim:—

1. In combination with an internal combustion engine having the usual base and main bearing for the crank shaft thereof which is provided with a lubricant well, an escape tube for pressure gases collecting in the base, an eduction tube connecting the lubricant well and the tube and within the tube formed as an aspirating nozzle, and means in the escape tube between the outlet end thereof and said nozzle for separating oil from air and gases passing through the escape tube and returning the same to the base of the engine.

2. In combination with an internal combustion engine having the usual base and main

bearing for the crank shaft thereof which is provided with a lubricant well, an escape tube for pressure gases collecting in the base, an eduction tube connecting the lubricant well and the tube and within the tube formed as an aspirating nozzle, means in the escape tube between the outlet end thereof and said nozzle for separating oil from air and gases passing through the escape tube and returning the same to the base of the engine, and a third tube of less diameter than the escape tube extended into the outlet end of the escape tube at one end and having its opposite end in communication with a source of suction.

3. The method of preventing escape of lubricant from the end bearings of the crank shaft of an internal combustion engine resulting from the accumulation of pressure in the base of the engine consisting in providing an escape for said pressure and employing vapors moving to such escape to eject oil from the bearing.

4. The method of preventing escape of lubricant from the end bearings of the crank shaft of an internal combustion engine resulting from the accumulation of pressure in the base of the engine consisting in providing an escape for said pressure and employing vapors moving to such escape to operate an ejector communicating with the bearing.

5. In combination with an internal combustion engine having the usual base and main bearing for the crank shaft thereof which is provided with a lubricant well, an escape tube for pressure gases collecting in the base, an eduction tube connecting the lubricant well and the tube and within the tube formed as an aspirating nozzle, an outlet in the escape tube between the outlet end thereof and said nozzle, and means in the escape tube for directing oil passing therethrough to said outlet.

6. In combination with an internal combustion engine having the usual base and main bearing for the crank shaft thereof which is provided with a lubricant well, an escape tube for pressure gases collecting in the base, an eduction tube connecting the lubricant well and the tube and within the tube formed as an aspirating nozzle, an outlet in the escape tube between the outlet end thereof and said nozzle, means in the escape tube for directing oil passing therethrough to said outlet, the outlet including a funnel-shaped sump, and a tube extending through the bottom of the said sump and having its upper end extending into the escape tube and provided with an opening facing the inlet end of the escape tube.

7. In combination with an internal combustion engine having the usual base and main bearing for the crank shaft thereof which is provided with a lubricant well, an escape tube for pressure gases collecting in the base, an eduction tube connecting the lubricant well and the tube and within the tube

formed as an aspirating nozzle, an outlet in the escape tube between the outlet end thereof and said nozzle, means in the escape tube for directing oil passing therethrough to said outlet, the outlet including a funnel-shaped sump, and a tube extending through the bottom of the said sump and having its upper end extending into the escape tube and provided with an opening facing the inlet end of the escape tube, said tube adjacent the bottom of the sump having openings formed therein. 10

In testimony whereof I hereunto affix my signature.

CHARLES H. L. KENDALL.