March 8, 1932. B. H. ANIBAL 1,848,986

ENGINE OILING SYSTEM

Filed April 14, 1927

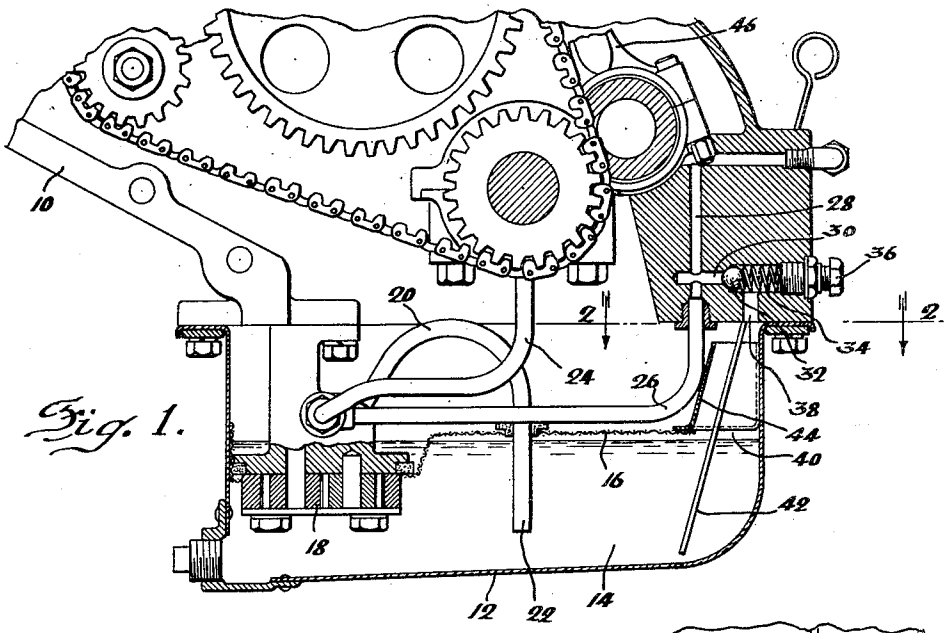


Fig. 1.

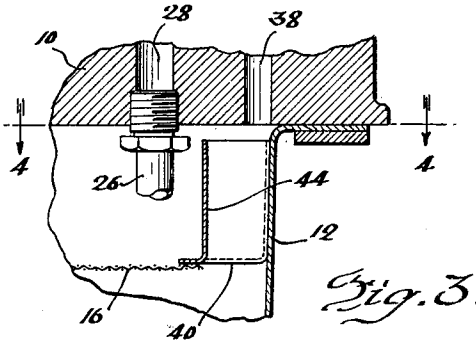


Fig. 3.

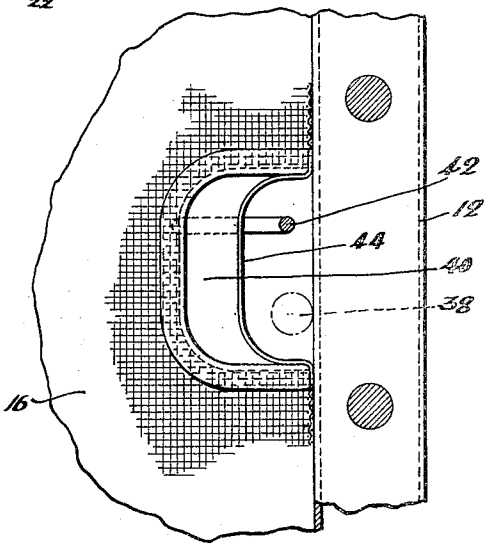


Fig. 2.

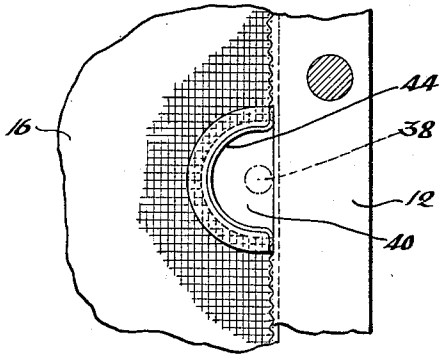


Fig. 4.

Inventor

Benjamin H. Anibal

By Blackmore & Spencer & Flint

Attorneys

Patented Mar. 8, 1932

1,848,986

UNITED STATES PATENT OFFICE

BENJAMIN H. ANIBAL, OF PONTIAC, MICHIGAN, ASSIGNOR TO GENERAL MOTORS CORPORATION, OF DETROIT, MICHIGAN, A CORPORATION OF DELAWARE

ENGINE OILING SYSTEM

Application filed April 14, 1927. Serial No. 183,783.

My invention relates to lubricating systems for internal combustion engines and more particularly to the straining means commonly used in connection with the oil pump to prevent dirt or other solid matter from getting into the pump or bearings and damaging them.

It has for its principal object the provision of a screen through which all oil returning to the oil pan from the bearings or cylinder walls must pass, the screen being provided with an opening through which surplus oil from the pump may be returned to the oil pan without passing through the screen. This is necessary because in cold weather the oil is apt to get so thick that the surplus discharged by the by-pass might not flow readily through the screen, or the oil returning to the crankcase from the bearings and cylinders might be prevented from passing through the screen by a film of cold oil previously deposited on the screen and which would have to be heated before any oil could pass through. This would be dangerous because there would be a possibility of the oil below the screen becoming exhausted before the oil above the screen was thinned out enough to pass through, and consequently the bearings might be damaged. There is also the possibility of the screen becoming clogged with dirt or sludge, which would interfere with the return of surplus oil from the pump. In my construction, this by-passed oil is returned to the crankcase through the opening in the screen, there being no objection to this as the surplus oil has come directly from the pump and is clean.

A further object is to utilize this opening in the screen for another purpose. It is common practice to use a measuring rod projecting through the crank case wall into the oil pan to ascertain the level of the oil in the oil pan. When such a measuring rod is used in an oil pan fitted with a screen, an opening must necessarily be provided in the screen for the measuring rod to pass through. In my invention the opening which is provided to permit the excess oil to return to the oil pan without passing through the screen also serves as a passage through which the measuring stick may be inserted into the oil pan. Another object is to provide a baffle plate around the opening through which surplus oil from the pump is being discharged, for the purpose of preventing such oil from splashing around in the crank case and possibly getting on the connecting rods and from there up into the combustion chamber. It is very necessary that the amount of oil which is supplied to the connecting rods be limited to a certain definite amount or otherwise the engine will be apt to "smoke" and an excessive amount of carbon will be formed. By the use of a baffle plate around the discharge opening for the surplus oil, the latter is positively conducted back into the oil pan and there is no possibility of its getting on the connecting rods.

With the above and other objects in view, my invention will be more clearly understood by referring to the specification and accompanying drawings, in which:

Figure 1 is a fragmentary transverse section through an internal combustion engine, showing my improved oiling system associated therewith.

Figure 2 is a section taken on the line 2—2 of Figure 1, showing the parts on a somewhat larger scale.

Figure 3 is a fragmentary view corresponding to Figure 1 but showing a slight modification.

Figure 4 is a section taken on line 4—4 of Figure 3.

The numeral 10 is used to designate a crankcase of an internal combustion engine to which is secured the usual oil pan 12 having a sump portion 14 normally filled with oil. Secured in the oil pan slightly below the normal oil level is a conventional gear type oil pump with a curved intake pipe 20 passing

through the screen and having its end 22 located considerably below the screen. The oil returning from the bearings and cylinder walls must pass through the screen on its way to the sump and solid particles are intercepted by the screen and prevented from getting into the pump or bearings supplied by the pump.

Leading from the pump is a pipe 24 supplying the main bearings with oil and another pipe 26 connected with a passage 28 in the crankcase casting 10. From the passage 28 the oil goes to the oil pressure gauge and the oil filter (not shown). Communicating with the passage 28 is another passage 30 normally closed by a ball valve 32 held in place by spring 34 and adjustable plug 36. The ball acts as a pressure relief valve to permit surplus oil delivered by the pump to return to the oil pan through passage 38.

The screen 16 is supposed to be cleaned at definite intervals, but should it not be cleaned often enough, or should a poor grade of oil containing an excess of sludge be used, the screen might become clogged. This would interfere with the return of oil into the oil pan and the supply of oil might get below the end 22 of the intake pipe and consequently the bearings would not be supplied with oil. To eliminate this possibility, I have provided the screen with an opening 40 located directly beneath the passage 38 so that surplus oil discharged from the by-pass may return directly into the oil pan without passing through the screen. Thus the pump will always be assured of a supply of oil as long as the level is kept above a certain point.

It will be readily seen that no matter how thick the by-passed oil may be, it will encounter no difficulty in returning to the sump portion. This is particularly desirable because, in cold weather when the oil is likely to be thick, there is a tendency on the part of some drivers to "race" the engine to warm it up. It is during this period that the bearings should be liberally supplied with oil to prevent damage.

To determine the level of the oil in the pan, a conventional measuring rod 42 is inserted through an opening in the crankcase wall and extends down into the sump portion. Ordinarily an opening is provided in the screen for this rod to pass through but in my construction the rod is so located that it will pass through the opening 40, thus eliminating the necessity of providing another opening.

Around the opening 40 I have placed a baffle plate 44 which serves the double purpose of preventing dirty oil from flowing into the sump without passing through the screen, and also to guide the surplus oil discharged from passage 38 directly back into the sump instead of permitting it to splash around in the crankcase and get on the connecting rods 46 and from them up into the combustion chamber. This baffle plate may be soldered or otherwise secured to the screen and is also fastened to the oil pan.

Figures 3 and 4 show a construction where no oil measuring rod is used. In this case the opening 40 and the baffle 44 may be considerably smaller and of the shape shown.

It is thought from the foregoing taken in connection with the accompanying drawing that the construction and operation of the device will be apparent to those skilled in the art, and that various changes in size, shape, and proportion and details of construction may be made without departing from the spirit and scope of the appended claims.

I claim:

1. In combination with an internal combustion engine having bearings to be lubricated, an oil pan, a screen extending horizontally across said pan and provided with an aperture, an oil pump adapted to withdraw oil from said pan, a conduit adapted to conduct oil from said pump to said bearings, a second conduit connected with the first named conduit at a point between said pump and said bearings, and a pressure relief valve located in said second conduit, the discharge end of said second conduit being located above said aperture in order that the oil passing through said relief valve may return to said oil pan without passing through said screen.

2. In combination with an internal combustion engine having bearings to be lubricated, an oil pan, a screen extending horizontally across said pan and provided with an aperture, an oil pump adapted to withdraw oil from said pan, a conduit adapted to conduit oil from said pump to said bearings, a second conduit connected with the first named conduit at a point between said pump and said bearings, a pressure relief valve located in said second conduit, the discharge end of said second conduit being located above said aperture in order that the oil passing through said relief valve may return to said oil pan without passing through said screen, and a wall secured to said screen around the edge of said aperture, said wall extending upwardly from said screen for the purpose of preventing substances deposited on the upper surface of the screen from passing through said aperture.

3. In combination with an internal combustion engine having bearings to be lubricated and a crankcase comprising upper and lower halves, an oil pan, a screen extending horizontally across said pan and provided with an aperture, an oil pump adapted to withdraw oil from said pan, a conduit adapted to conduct oil from said pump to said bearings, a second conduit connected with the first named conduit at a point between said pump and said bearings, said second conduit

being located in the upper half of said crankcase, and a pressure relief valve located in said second conduit in such position that said relief valve will be accessible for adjustment from the exterior of said crankcase without necessitating the removal of any of the engine parts, the discharge end of said second conduit being located above said aperture in order that the oil passing through said relief valve may return to said oil pan without passing through said screen.

In testimony whereof I affix my signature.

BENJAMIN H. ANIBAL.