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J. A. NIEDENS

2,173,631

OIL-REFINING APPARATUS

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Fig. 1.

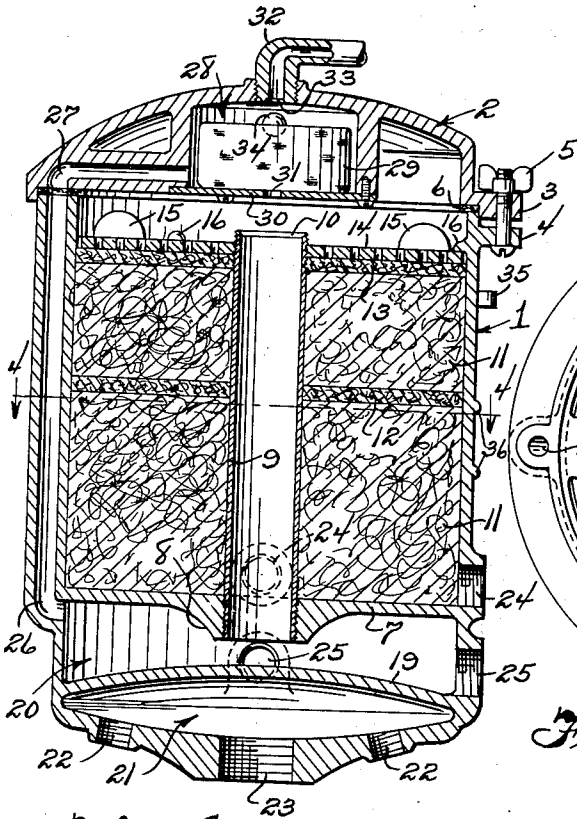


Fig. 2.

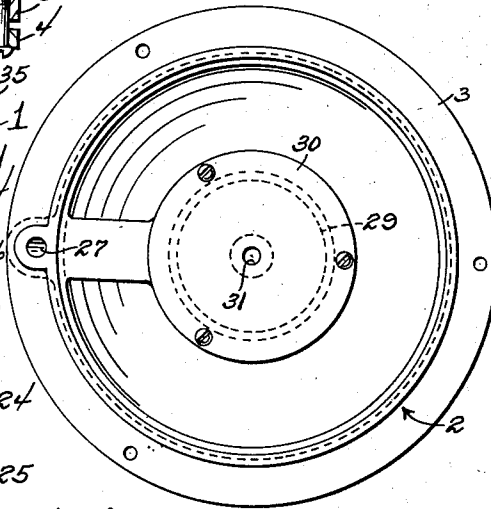


Fig. 3.

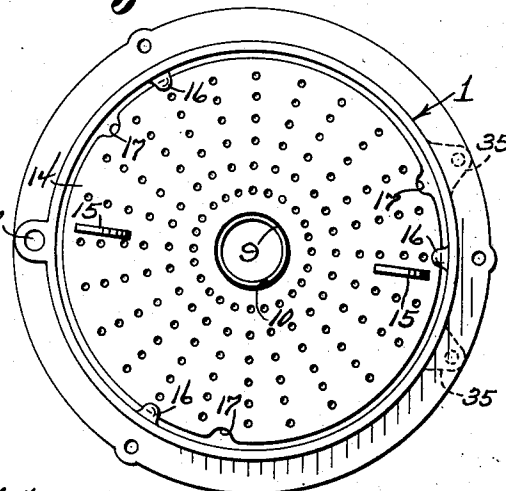
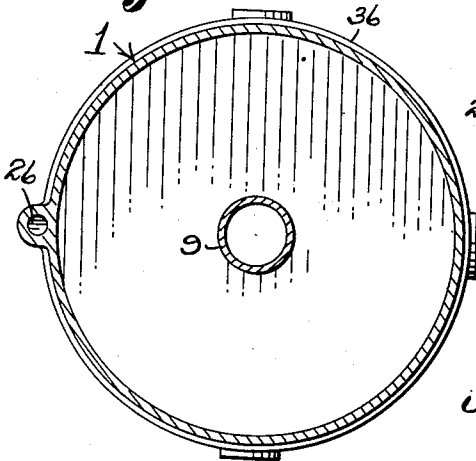


Fig. 4.



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OIL-REFINING APPARATUS

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6 Claims. (Cl. 210—131)

This invention relates to oil refining apparatus, and its general object is to provide an apparatus of that character which is primarily designed for use with an internal combustion engine, for disposal in direct communication with the crank case thereof, for the passage of the oil from the crank case, through the apparatus and back to the crank case, the apparatus acting to not only filter the oil to remove all solid matter therefrom, but removes diluents, such as water, fuel, acid and other undesirable liquids which are detrimental to the proper lubrication of the engine, so that the oil is returned to the crank case in a clean and purified condition, with the result it will be obvious that my apparatus eliminates the necessity of changing the oil from time to time, increases the efficiency of the engine lubrication system, and materially decreases oil consumption.

A further object is to provide an oil refining apparatus that acts to remove all detrimental liquids from the oil, by evaporation and utilizes the heat of the exhaust gases from the engine for that purpose.

Another object is to provide an oil refining apparatus that can be easily and expeditiously installed, and can be carried directly by the engine, or applied to a motor vehicle in communication with the engine, and is simple in construction, inexpensive to manufacture, and extremely efficient in operation, use and service.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawing and specifically pointed out in the appended claims.

In describing the invention in detail, reference will be had to the accompanying drawing wherein like characters denote like or corresponding parts throughout the several views, and in which:

Figure 1 is a vertical sectional view taken through the apparatus which forms the subject matter of the present invention.

Figure 2 is a bottom plan view of the cover member or cap.

Figure 3 is a top plan view of the apparatus with the cap removed.

Figure 4 is a sectional view taken approximately on line 4—4 of Figure 1, looking in the direction of the arrows.

Referring to the drawing in detail, it will be noted that my apparatus includes a cylindrical casing provided by a body 1 having an open upper end closed by a cap 2 which has formed

thereon an annular flange 3, while the body is provided with an annular flange 4 and the flanges have openings therein for registration with each other for receiving bolts of bolt and nut connections 5 for removably securing the cap to the body, as shown in Figure 1, the cap having an annular shoulder at the juncture of the flange therewith for receiving a gasket 6 to provide a leak proof connection between the cap and body. The nuts of the connections 5 are of the wing type to facilitate the removal and application of the cap, as will be apparent.

Disposed within the body 1 and formed on the cylindrical wall thereof adjacent to its lower end is a disk shaped partition 7 centrally enlarged to provide a depending portion 8, and the centrally enlarged depending portion has a threaded opening therethrough, to threadedly receive the lower end of an oil feed tube 9 rising centrally within the body, but terminating at its upper end below the upper end of the body as shown in Figure 1, and the upper end of the tube is preferably inwardly beveled as at 10.

Disposed within the body between the partition 7 and the upper end thereof is a mass 11 of filtering material of any kind suitable for the purpose, such as cotton waste, etc., and the material is disposed upon the opposite sides of a felt disk 12 and a similar disk 13 rests upon the top of the material, the disks being of a diameter to fit the cylindrical wall of the casing and have openings therein for disposal about the tube 9. Mounted upon the upper felt disk 13 is a disk shaped filter plate 14 which is perforated for the passage of the oil therethrough and has a centrally disposed opening to receive the tube 9. The plate 14 is removable, and in order to facilitate its application and removal, it is provided with handles 15 in the form of ears formed on and rising therefrom adjacent its outer edge and disposed diametrically opposite each other, as best shown in Figure 3. The plate is held against the disk 13 in a manner to compress the filtering material, by lugs 16 formed on the wall of the body and engaged with the upper surface of the plate adjacent to the periphery thereof, the plate having notches 17 in its periphery to allow for the passage of the lugs therethrough in removing and applying the plate, as will be apparent upon inspection of Figure 3.

Formed within the body of the casing between the partition 7 and the closed lower end or bottom 18 thereof is an upwardly curved convexo-

concave partition 19 that provides an upper vaporizing chamber 20 and a lower exhaust gas receiving chamber 21, and the bottom 18 has threaded outlet openings 22 therein, disposed upon opposite sides of a centrally arranged threaded inlet opening 23. It will be obvious that the chamber 21 is arranged in communication with the exhaust pipe of the engine, through the medium of a suitable pipe connected thereto and threaded in the inlet opening 23, and outlet pipes are threaded in the openings 22, for conveying the exhaust gases from the chamber.

The body is provided with inlet openings 24 arranged therein at the point of juncture with the partition 7 thereof, for threadedly receiving pipes disposed in communication with the crank case of the engine for conveying the oil from the latter to the apparatus, and the vaporizing chamber is provided with outlet openings 25 for threadedly receiving pipes in communication with the crank case for returning the clean and purified oil thereto.

Formed with the body and extending vertically and exteriorly thereof from the vaporizing chamber 20 is a moisture and vapor escape tube 26 that has its lower end communicating with the chamber 20 and its upper end terminates with the upper end of the body, but is in registration with a passage 27 extending horizontally within the cap 2 to a float chamber 28 centrally disposed within the cap, the chamber having mounted therein a float 29 normally resting upon a plate 30 detachably secured to the inner surface of the cap for closing the chamber 28. The plate 30 is provided with an inlet opening 31 centrally disposed with and overlying the upper end of the oil feed tube 9, and the cap as shown is of substantially dome-shape configuration, with an outlet opening in the upper end thereof, that has threadedly mounted therein a nipple 32 provided with a seat 33 arranged in the path of a ball 34 carried by the float and engageable with the seat for closing the outlet, as will be apparent upon inspection of Figure 1.

The container may be attached directly to the engine, or any other appropriate place adjacent thereto and for that purpose I provide bracket lugs 35 and annular ribs 36 which provide a seat for a mounting strap, not shown, for disposal in surrounding relation with respect to the body, as will be apparent.

From the above description and disclosure of the drawing, it is believed that the operation of my apparatus will be obvious, but it might be mentioned that the oil from the crank case passes into the filtering chamber from the inlets 24, for disposal through the filtering material and the felt pads, which removes the solid matter therefrom such as carbon, dirt, metallic particles, etc. The oil then passes through the apertures of the filter plate 14 and thence down the tube 9 for disposal within the vaporizing chamber 20 where it contacts the partition 19 which is heated by the exhaust gases within the chamber 21, therefore the oil will be subjected to the heat which will evaporate the undesirable liquids therefrom, and from the chamber 20 the oil is returned to the crank case in a clean and purified condition. The moisture and vapor from the oil rises through the tube 26, and through the passage 27 to the chamber 28, and from the latter to the atmosphere through the nipple 32 that has an outlet pipe connected thereto in any suitable manner.

The automatic check valve of the cap becomes

active in the event the oil is obstructed in its return passage to the crank case, and in that event it is believed that it will be obvious that if the oil should rise to an extent to pass through the inlet opening 31 of the plate 30, the float 29 will be elevated to seat the ball 34, thereby preventing the passage of the oil through the moisture and vapor outlet means.

It is thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claims.

What I claim is:

1. An oil refining apparatus for an internal combustion engine, comprising a casing, a filtering chamber within the casing and having inlet means for disposal in communication with the crank case of the engine, filtering material in said chamber, a vaporizing chamber below the filtering chamber and having outlet means for the return of the oil to the crank case, means for passing the filtered oil from the filtering chamber to the vaporizing chamber, an exhaust gas receiving chamber below the vaporizing chamber for heating the latter, and vapor outlet means for the vaporizing chamber.

2. An oil refining apparatus for an internal combustion engine, comprising a casing, a filtering chamber within the casing and having inlet means for disposal in communication with the crank case of the engine, filtering material in said chamber, a vaporizing chamber below the filtering chamber and having outlet means for the return of the oil to the crank case, means for passing the filtered oil from the filtering chamber to the vaporizing chamber, an exhaust gas receiving chamber below the vaporizing chamber for heating the latter, vapor outlet means for the vaporizing chamber, and means to prevent the escape of oil through the vapor outlet means.

3. An oil refining apparatus for an internal combustion engine, comprising a casing, a partition in said casing and providing a filtering chamber having inlet means for disposal in communication with the crank case of the engine, filtering material in said chamber, a vaporizing chamber below the filtering chamber and having outlet means for the return of the oil to the crank case, means rising from the partition for the passage of the filtered oil from the filtering chamber to the vaporizing chamber, means for compressing the filtering material below the oil passage means, an exhaust gas receiving chamber below the vaporizing chamber for heating the latter, vapor outlet means for the vaporizing chamber and means to prevent the escape of oil through the vapor outlet means.

4. An oil refining apparatus for an internal combustion engine, comprising a casing, a filtering chamber within the casing and having inlet means for disposal in communication with the crank case of the engine, filtering material in said chamber, a vaporizing chamber below the filtering chamber and having outlet means for the return of the oil to the crank case, means for passing the filtered oil from the filtering chamber to the vaporizing chamber, an exhaust gas receiving chamber below the vaporizing chamber for heating the latter, vapor outlet means for the vaporizing chamber, a float chamber having communication with the vapor outlet means, the filtering

chamber and the vaporizing chamber, and float actuated valve means in the float chamber for controlling the vapor outlet means to prevent the escape of oil therethrough.

- 5 5. An oil refining apparatus for an internal combustion engine, comprising a casing having a closed bottom and an open top, a cap detachably closing the open top, a partition in said casing and providing a filtering chamber having inlet means
10 at the lower end thereof, filtering material in said chamber, a filtering plate compressing the filtering material and detachable from the casing, a vaporizing chamber below the filtering chamber and having oil outlet means, an oil tube rising
15 from the partition for disposal through the filtering material and above the latter for the passage of oil from the filtering chamber to the vaporizing chamber, a partition between the first partition and the bottom of the casing for cooperation with
20 the latter to provide an exhaust gas receiving chamber for heating the vaporizing chamber, the latter partition being rounded upwardly with its highest point disposed directly below the oil tube, and vapor outlet means for the vaporizing chamber,
25 and extending through the cap.

6. An oil refining apparatus for an internal

combustion engine, comprising a casing having a closed bottom and an open top, a cap detachably closing the open top, a partition in said casing and providing a filtering chamber having inlet means
5 at the lower end thereof, filtering material in said chamber, a filtering plate compressing the filtering material and detachable from the casing, a vaporizing chamber below the filtering chamber and having oil outlet means, an oil tube threaded
10 to the partition and rising therefrom for disposal through the filtering material and above the latter and the filtering plate, for the passage of oil from the filtering chamber to the vaporizing
15 chamber, a partition between the first partition and the bottom of the casing and providing an exhaust gas receiving chamber having a centrally disposed inlet means and outlet means upon opposite
20 sides thereof, a float chamber in the cap and communicating with the vaporizing chamber, vapor outlet means for the vaporizing chamber and communicating with the float chamber, outlet means for the float chamber, and float actuated valve means for controlling the outlet means
of the float chamber.

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