This invention relates to improvements in centrifuges for cleaning liquids.

In the interests of brevity we shall hereafter assume that the liquid to be cleaned is engine oil, e.g. oil used for the lubrication of internal combustion engines.

Experience has shown that the most effective cleaner for lubricating oil is a centrifuge.

On the other hand, the use of a centrifuge ordinarily necessitates the employment of gearing and entails the drawback that the speed of rotation, if the drive is taken from the engine, varies with the engine speed. Considerable complication arises when an electric drive is employed.

Our invention contemplates the utilisation of the kinetic energy in the oil in circulation.

This energy is most efficiently utilised when the centrifuge is constructed as a rotary motor of the jet type according to the principle of Hero's engine.

The oil may be fed through a branch from the main forced-feed lubrication system, or may be fed from a separate pump, or from a scavenge pump used for evacuating the crankcase, if it be understood that in all cases the oil pressure is approximately uniform.

The oil is admitted axially into a drum rotatable on a vertical axis mounted preferably on ball bearings, said drum itself being contained in an outer casing having a movable cover.

If the casing is disposed above the oil tank, then a clear space is left between the bottom of the casing and the top of the oil tank.

Assuming that the drum is rotatable around a hollow vertical spindle, the lateral wall of the spindle is furnished with outlet ports through which the oil passes into the drum.

Leaving from the bottom of the drum is or are one or more discharge nozzles having, or each having, a tangential setting. Suitably, each discharge nozzle is in the form of a curved elbow having a vertical portion within the drum and a horizontal portion between the drum and the tank.

In the rotation of the drum, jets of oil are discharged at high speed through the said nozzles, and, by reaction, the drum is caused to rotate at high speed.

The drum which constitutes the centrifuge is of such capacity that a large amount of dirt can be allowed to accumulate before the filter requires to be taken apart for cleaning.

Provision may be made for leakage along the upper spindle to a point above the said ports of any air that may have entered the lubrication system so that such air may accumulate at the upper end of the drum, which thus acts not only as a centrifugal separator but also as a deaerator.

In arriving at the above described construction, we attempted also to use the kinetic energy in the oil by causing it to flow at high velocity from fixed nozzles to impinge on vanes attached to the drum which in this case was open to the atmosphere at the top and had a suitable outlet at the bottom. After leaving the vanes the oil was to fall into the drum and so be centrifuged, but we found this method to be inefficient compared with that which has been above described.

The invention will be further described in connection with the accompanying drawing in which:

Fig. 1 is a vertical sectional view of a centrifugal oil cleaner for separating dirt in the oil in circulation.

2. We claim:

In a centrifugal oil cleaner for separating dirt
from oil including a casing and a cylindrical drum mounted within the casing for rotation about a vertical axis, said drum having top, bottom and side walls and being adapted to retain the dirt separated from the oil, fixed hollow vertical spindle extending axially through the top and bottom walls of the drum and on which said drum is mounted for rotation, the axis of said spindle being coincident with the axis of rotation of said drum, means for conducting the oil to be cleaned to one end of the hollow spindle, said spindle being provided with at least one lateral port opening into the interior of the drum for conducting oil to be cleaned from the hollow spindle to the interior of the drum, and at least one oil discharge nozzle tube for the discharge of clean oil from the drum including an upright portion in the drum extending above the bottom wall thereof and a portion projecting through the bottom wall of the drum and terminating below the drum in a discharge nozzle, the upright portion of the nozzle tube which extends above the bottom wall of the drum having an opening therein a substantial distance above the bottom of the drum and a substantial distance inwardly from the vertical side wall thereof, the portion of said nozzle tube projecting through the bottom wall of the drum having a tangential setting whereby said drum is caused to rotate by the reaction of a jet of clean oil flowing through the nozzle tube and issuing from the discharge nozzle.

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