Feb. 19, 1929. 1,702,489

M. M. BASSETT

OIL FILTER

Filed May 6, 1927

Fig. 1.

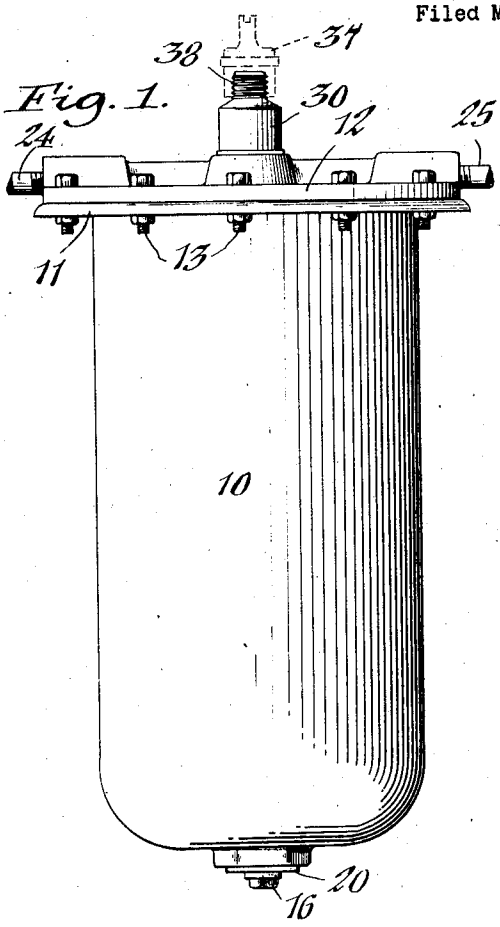


Fig. 2.

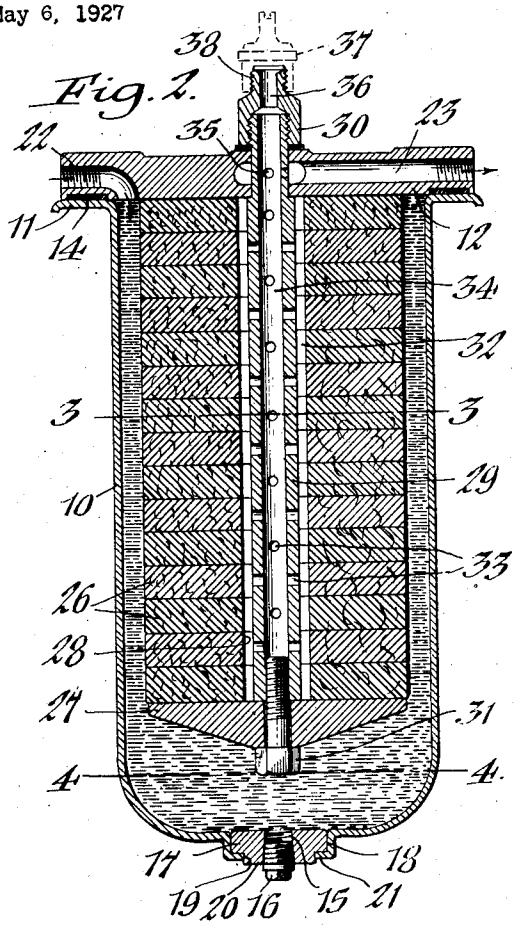
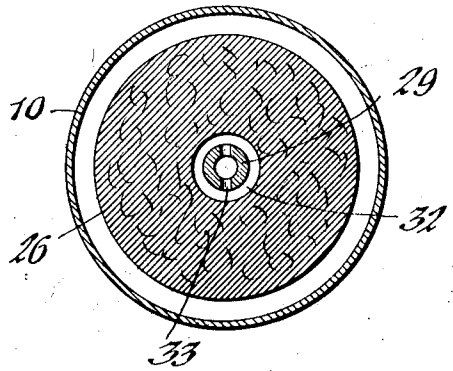


Fig. 3.



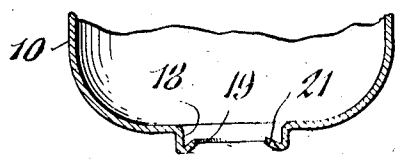


Fig. 4.

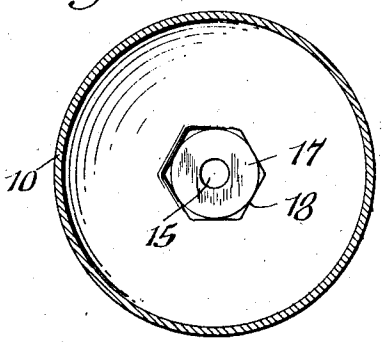


Fig. 5.

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UNITED STATES PATENT OFFICE.

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OIL FILTER.

Application filed May 6, 1927. Serial No. 189,264.

This invention relates to an oil filter which has been more particularly designed for use in connection with the lubricating systems of automotive vehicles, although it may be used in other installations and machinery where it is desirable to filter the lubricant.

One of its objects is the provision of a simple, inexpensive and durable filter of this character which will thoroughly and effectively remove any solid particles from the oil, thereby affording a saving in the oil consumption of the engine and insuring a circulation of clean oil to its various parts requiring lubrication.

Another object of the invention is to so organize and construct its parts that the filter may be readily cleaned, when desired, without disassembling or detaching it from the vehicle.

A still further object is to treat the filtering elements in such a manner that they will retain the suspended matter and yet permit the oil to flow through them to the required extent to insure its positive and thorough filtration.

In the accompanying drawings:—Figure 1 is a side elevation of an oil filter embodying my invention. Figure 2 is a vertical longitudinal section thereof. Figure 3 is a horizontal section on line 3—3, Fig. 2. Figure 4 is a horizontal section on line 4—4, Fig. 2. Figure 5 is a fragmentary vertical section of the filter casing showing the manner of attaching the screw plug in place.

Similar characters of reference indicate corresponding parts throughout the several views.

The improved filter may be attached to the motor vehicle at any convenient point, say, for example, beneath the hood and adjacent to the engine. In its preferred construction shown in the drawings, the filter consists of a casing or receptacle 10 of sheet steel or other appropriate material through which the oil circulates while undergoing filtration. The top of this casing terminates in an outwardly-facing annular flange 11 to which a cover 12 is detachably secured, as by bolts 13, a gasket 14 being inserted between these parts to prevent leakage of oil. The bottom of the casing has a drain opening 15 normally fitted with a screw plug 16, said opening being formed in a collar or nut 17 pressed firmly and tightly into a polygonally-shaped recess or depression 18 which may be formed by punching the bottom of the casing outwardly, as shown in Figs. 2 and 5. The recess has a central opening 19 and the collar has a depending neck 20 which extends through the same. In assembling the collar 17 in the casing-recess, the rim 21 of the latter is originally flared upwardly as shown in Fig. 5 and when the collar is pressed into position, said rim is forced downwardly and snugly against the collar-neck 20 to form a leak-proof joint between these parts. The collar is likewise polygonal to conform to the shape of the recess and to prevent its turning during the application and removal of the screw plug 16. Preferably formed in the cover 12 and opening into the filter-casing 10 is an inlet and outlet 22, 23 adapted to be connected by pipes 24, 25, respectively, with the lubricating system of the vehicle.

Suspended within the casing from its cover 12 is a filtering element which comprises a plurality of fibrous or porous pads or disks 26 tightly compressed between said cover and a lower head plate 27. These filter-pads have central openings 28 through which a combined tie member and filter discharge tube 29 pass, the upper end of the latter extending through the cover and having an external thread thereon for receiving a clamping nut 30 and the head plate 27 being secured to the lower end of said tube by a clamping bolt 31. A drainage channel 32 for the filtered oil may be formed between the pad-openings 28 and the discharge tube. In its side, the latter has a plurality of lateral ports 33 for conducting the oil from the drainage channel 32 to the discharge passage 34 of the tube, the uppermost set of ports 35 opening into the filter-outlet 23.

The filter pads 26 are preferably made of felted fibrous material, such as wool, treated with a substance whose solution, on evaporation, yields a pervious residue possessing adhesive properties which not only acts to stick the pads together as a unit but also renders them sufficiently dense to retain the suspended matter and at the same time permit the passage of oil through them, thus insuring a positive and thorough filtration of the oil. The substance for so treating the filter pads preferably consists of an aqueous solution of an alkali metal silicate, as for example, sodium silicate (water glass) or a solution of cellulose acetate and a suitable organic solvent, such as acetone, ethyl or

amyl acetate. This treatment of the pads may be accomplished in any suitable manner, for example, by boiling them for a short period in the silicate or other solution, during which period they become thoroughly impregnated or saturated. The silicate or other solution is distributed uniformly throughout the fibers of the pads and when the latter are dried, the silicate or other material assumes a more or less pervious condition, which greatly increases the filtering efficiency of the pads without detriment to their capacity. By treating the pads in this fashion, a thorough removal of the solid particles from the oil is insured, such particles being deposited mainly on the outside surface of the filtering media and may be readily removed in the manner presently to be described.

The filtering unit may be readily cleaned, when desired, by simply removing the drain plug 16 and then admitting air under pressure through the filter discharge tube 29. To this end, the nut 30 at the upper end of this tube has an inlet port 36 opening into the tube-passage 34 and normally sealing this port is a screw cap 37. By attaching the hose of an air pump to the threaded upper extension 38 of the nut, the pads can be thoroughly cleaned in a minimum period of time.

Briefly stated, the operation of the improved filter is as follows:—

The lubricant to be filtered enters the casing 10 through its inlet 22 and fills the same as indicated in Fig. 2. In passing from this casing to the discharge tube 29 the oil is delivered under pressure through the filter pads 26, which effectually remove the solid particles from the used oil and deliver it clean and pure to the drainage channel 32 from which it flows into the discharge passage 34 of the tube 29 and thence outwardly through the casing-outlet 23 to the parts of the system to be lubricated.

I claim as my invention:—

1. A filter of the character described, comprising a sheet metal casing having an inlet and an outlet, a filter discharge tube arranged in said casing and communicating with said outlet, a filtering element surrounding and discharging into said tube, the bottom of the casing having a polygonal recess therein containing an opening, and a polygonal collar containing a drain opening fitted in said recess and having a depending neck engaging the recess-opening and forming a pressed leak-proof joint with the marginal edge thereof.

2. A device of the character described, comprising a casing having a polygonal recess therein containing an opening, and a polygonal collar containing a drain opening fitted in said recess and having a neck engaging the recess opening and forming a pressed leak-proof joint with the marginal edge thereof.

MILLSON M. BASSETT.