Dec. 4, 1951 W. R. STAFFORD 2,577,217

FILTER

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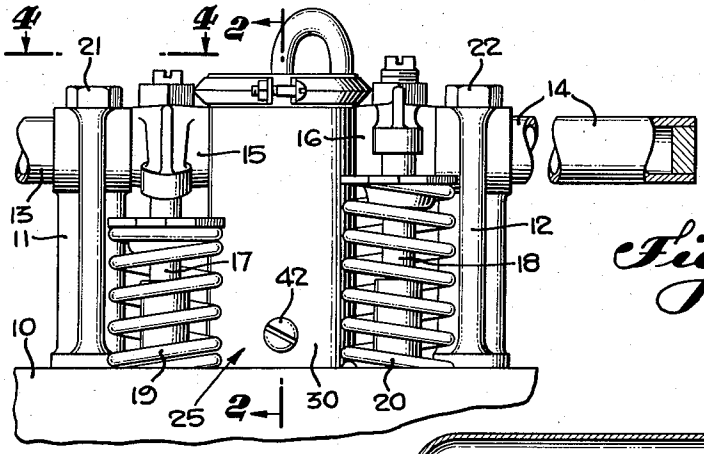


Fig. 1.

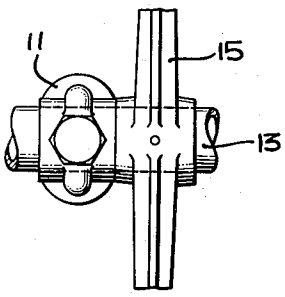


Fig. 4.

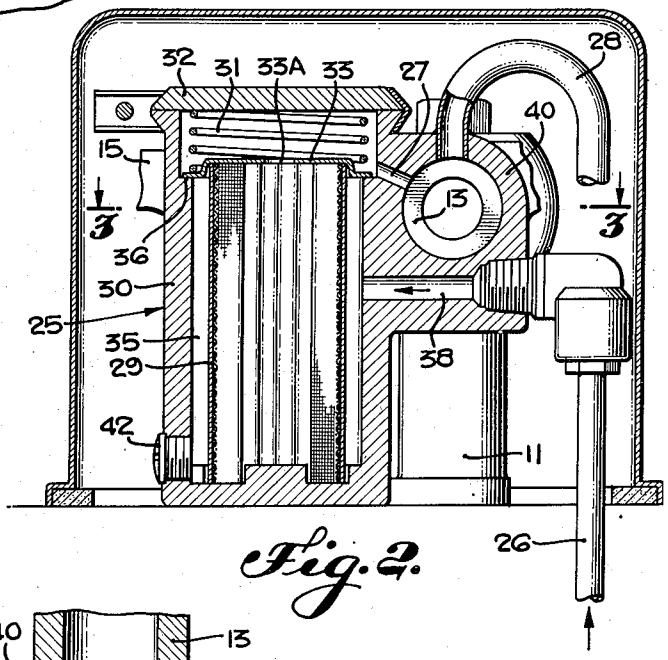


Fig. 2.

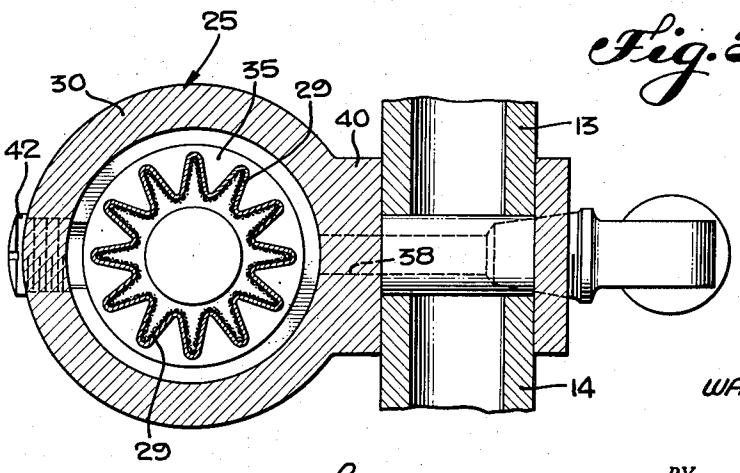


Fig. 3.

WALTER R. STAFFORD,
INVENTOR.

BY Lyon & Lyon

ATTORNEYS

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FILTER

Walter R. Stafford, Los Angeles, Calif., assignor to Elmer J. Wolfer, Los Angeles, Calif.

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4 Claims. (Cl. 210—164)

1

The present invention relates to a filter structure associated with hollow rocker arm shafts in automobiles.

An object of the present invention is to provide an improved oil filtering arrangement which is adapted for use either with new automobiles or with presently existing automobiles.

Another object of the present invention is to provide an improved filtering arrangement which may be readily installed in existing automobiles without the necessity of removing the crank case pan.

Another object of the present invention is to provide an improved filtering arrangement particularly applicable for installation between the axially aligned hollow rocker arm shafts of an automobile such as the Chevrolet type.

A further object of the present invention is to provide an improved oil filtering arrangement of this character which automatically serves to bypass the oil from flowing through the filter medium in the event that the filter medium becomes clogged from infrequent cleaning or replacement.

The features of the present invention which are believed to be novel are set forth with particularity in the appended claims. This invention itself, both as to its organization and manner of operation, together with further objects and advantages thereof may be best understood by reference to the following description taken in connection with the accompanying drawings in which:

Figure 1 is a view in side elevation of a filtering structure mounted on the rocker arm shaft of an automobile in accordance with features of the present invention,

Figure 2 is a sectional view taken substantially on the line 2—2 of Figure 1,

Figure 3 is a sectional view taken substantially on line 3—3 of Figure 2, and

Figure 4 is a view taken substantially in the direction indicated by the lines 4—4 in Figure 1.

The figures show a conventional automobile structure which includes the motor block 10 with upstanding brackets 11, 12 thereon for stationarily supporting respectively the aligned hollow rocker arm shafts 13, 14, there being pivotally mounted on such shafts 13, 14 the corresponding rocker arms 15, 16 which are adapted to engage and move the corresponding valve stems 17, 18, and which are normally biased upwardly by the corresponding coil compression springs 19, 20.

These two stationary rocker arm shafts 13, 14 are spaced from one another as shown in Figure

2

3, and normally, in a Chevrolet automobile, a band or hollow cylinder (not shown) encircles the adjacent ends of the rocker arm shafts 13, 14 with an oil entrance port in such band or cylinder whereby oil may be introduced into such hollow shafts 13, 14 at their adjacent ends. In accordance with the present invention, such conventional band or cylinder is removed and an oil filter structure is mounted in place, as described in detail hereinafter.

The outer ends of the rocker arm shafts 13, 14 are plugged as conventional, but the walls of such shafts 13, 14 are apertured as indicated in Figure 4 to allow oil originally introduced in the shaft to flow out of the shaft to provide lubrication for the pivotally mounted rocker arms 15, 16, as well as the valve springs 19, 20. These rocker arm shafts 13, 14 are normally maintained stationary in the brackets 11, 12 by corresponding locking nuts 21, 22. In adapting the present oil filter to the automobile, the bolts 21, 22 are released to allow axial outward movement of the hollow shafts 13, 14, after which the oil filter 25 is inserted in place, the shafts 13, 14 then move inwardly to their original position, and the bolts 21, 22 are then tightened.

For this purpose the oil filter structure has a special construction whereby it may be fitted in between the valve springs 19, 20 with an apertured portion adapted to snugly receive opposite ends of the shafts 13, 14, in the manner shown in Figure 3.

Oil enters the filter 25 through the oil inlet tube 26. After passing through the filter 25, the oil travels through the channel 27 which is in communication with the aligned bores of shafts 13, 14. The outer ends of these shafts 13, 14 are plugged and oil normally flows outwardly of the same through the lubricating apertures indicated in Figure 4; but in the event of excessive pressure within the interior of the shafts 13, 14, the oil may flow upwardly into the overflow tube 28, which may extend downwardly into the crank case of the automobile motor.

The filter medium may, of course, take different forms and shapes, and preferably comprises a replaceable oil-porous membrane 29 in cylindrical form and of composition material or of wire mesh. This cylindrical member 29 is disposed within an oversized cylindrical chamber 35 in the filter body 30, and is pressed against the base of such body by the prestressed coil compression spring 31, having its upper end abutting the associated cover 32 for the filter body 30 and its lower end abutting the dished and apertured

pressure plate **33**, the plate **33** being in engagement with the cylindrical member **29**.

It is noted further that the annular flange of plate **33** is normally in engagement with an associated annular abutment **36** to normally prevent the oil from flowing directly from the chamber **35** into the channel **27**.

Normally, oil flows from conduit **26**, through oil channel **38**, into the chamber **35**, through the filter medium **29**, through the central aperture **33A** and through the oil channel **27** into the hollow shafts **13**, **14**. However, in the event of excessive oil pressure in the chamber **35**, the pressure plate **33** is moved upwardly by such pressure against the action of the prestressed compression spring **31** to thereby allow the oil to bypass the filter medium **29** and flow directly from chamber **35** into the oil outlet port **27**. This condition of excessive pressure may result, for example, when the filter medium **29** becomes clogged from infrequent cleaning or replacement.

A feature of the present invention is that essentially no fastening elements are required to fasten the filter, there being provided for this purpose the integrally formed cylindrical portion **40** with its bore only slightly larger than the outside diameter of the shafts **13**, **14** whereby such cylindrical portion **40** coacts with the ends of shafts **13**, **14** not only to support the filter on such shafts **13**, **14**, but also to coact therewith to form oil seals.

A removable drain plug **42** may be screwed into a drain aperture located in communication with substantially the lowest point in the chamber **35**.

While the particular embodiments of the present invention have been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from this invention in its broader aspects and, therefore, the aim in the appended claims is to cover all such changes and modifications as fall within the true spirit and scope of this invention.

I claim:

1. In a filtering arrangement of the character described, a pair of axially aligned hollow rocker arm shafts with their opposite ends spaced, an oil filter body having an oil inlet and an oil outlet, a cylindrical chamber in said body with the axis thereof extending generally vertically, said body having integrally formed therewith a cylindrical portion with the axis of said cylindrical portion extending generally horizontally, said cylindrical portion overlaying said opposite ends of said rocker arm shafts to provide a support for said oil filter body and to provide an oil seal between said filter and the outside surfaces of said shafts, a cylindrical filter medium of diameter somewhat less than the diameter of said chamber disposed within said chamber to provide an annular space within said chamber, said oil inlet being in communication with said annular space, said oil outlet being in communication with said cylindrical portion and in communication with the adjacent open ends of said

shafts, said oil inlet and outlet being normally in communication with each other through said filter medium, a spring urged pressure plate normally resting on an annular shoulder in said body and providing a movable baffle between said oil inlet and said oil outlet, said pressure plate being movable away from said annular shoulder upon the occurrence of excessive pressure in said annular space, due, for example, to clogging of the filter medium, to thereby allow oil to flow from said inlet to said outlet without passing through said filter medium.

2. In a filtering arrangement of the character described, the combination comprising: a pair of axially aligned spaced hollow rocker arm shafts, a filter structure having an oil inlet and an oil outlet, said filter structure including a cylindrical portion snugly receiving both of the adjacent ends of said shafts to support said structure on said shafts and to provide therewith an oil seal, said oil outlet being in communication with said cylindrical portion and the bores of each of said shafts.

3. A filter structure of the character described, comprising: a body with a cylindrical chamber extending generally vertically, a cylindrical filter medium within said chamber of diameter somewhat less than the internal diameter of said chamber to provide an annular oil space outside and immediately adjacent said filter medium, said body having an annular shoulder adjacent said chamber, an apertured pressure plate normally resting on said shoulder, a prestressed coil compresion spring acting between said body and said pressure plate to normally press said pressure plate against said shoulder, said body having an oil inlet in communication with said annular space, said body having on oil outlet in communication with the interior of said cylindrical filter medium, said pressure plate being disposed to provide a movable baffle between said annular space and said oil outlet, said body having an integrally formed cylindrical portion adapted to receive opposite ends of aligned hollow shafts to support said filter structure on said shafts and to provide an oil seal therewith, and said oil outlet being in communication with the bore of said cylindrical portion.

4. An oil filter of the character described, comprising: a body having an oil inlet and an oil outlet, said body incorporating a filter medium through which oil passes in its flow from said inlet to said outlet, said body having a cylindrical portion overlying and snugly receiving opposite ends of axially aligned tubular rocker arm shafts to support said body on said rocker arm shafts and to provide an oil seal therewith.

WALTER R. STAFFORD.

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