

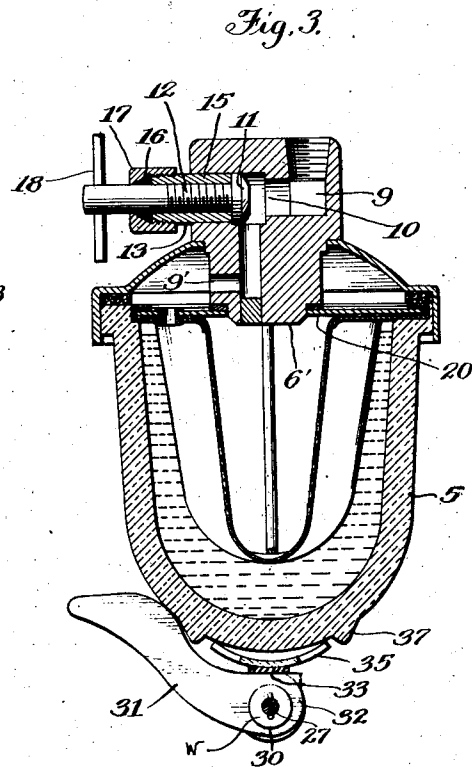
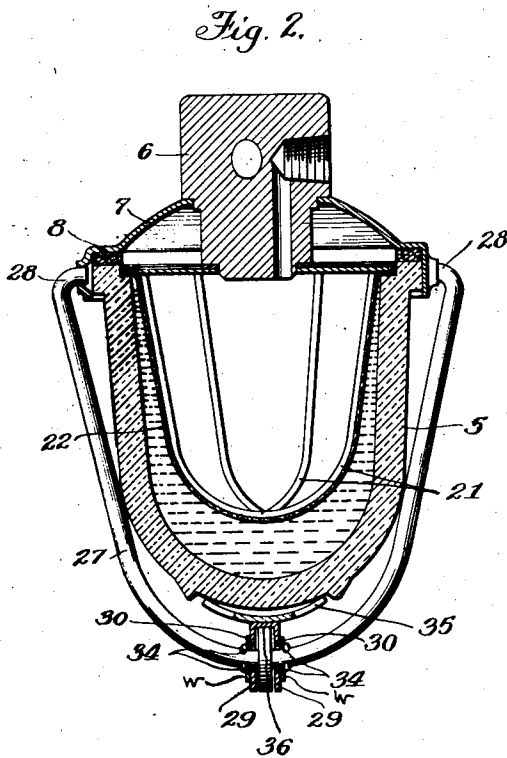
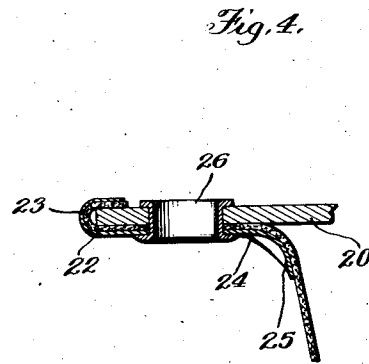
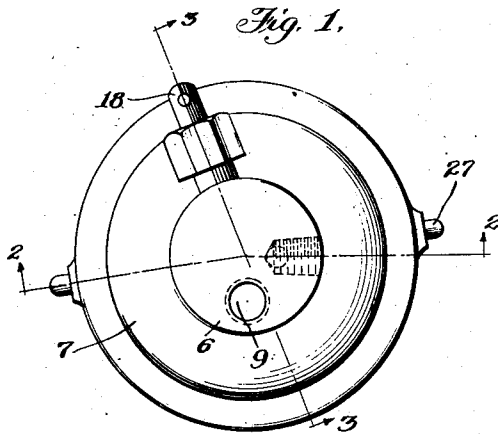
Nov. 18, 1930.

G. F. THOMAS ET AL

1,781,964

FILTER

Filed Nov. 30, 1925



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UNITED STATES PATENT OFFICE

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FILTER

Application filed November 30, 1925. Serial No. 72,243.

Our invention relates to improvements in filters and is particularly concerned with improvements in filters for filtering the supply of fuel to internal combustion engines, although it will be apparent, from a perusal of this specification, that our invention is capable of being used for other purposes.

Our invention is particularly concerned with filters of that type comprising a receptacle having an open end and a cap for closing the open end of the receptacle, the cap being provided with inlet and outlet openings, and the receptacle housing the filtering element that separates the impurities from the fuel as the fuel passes from the inlet opening to the outlet opening.

One of the objects of our present invention is to provide simple means for securing the cap to the receptacle, of such construction that they can be economically manufactured and easily operated.

A further object of our invention is to provide means, such as described, that make it possible for the operator easily and quickly to remove the receptacle and filter element from the filter, either for the purpose of cleaning the receptacle and filter element or for the purpose of replacing the filter element with a new one.

A still further object is to provide means for securing the cap to the receptacle that is self-locking.

Other objects of our invention will appear as this description progresses, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of our improved filter;

Figure 2 is a section therethrough on line 2—2;

Figure 3 is a vertical section therethrough on line 3—3; and

Figure 4 is a sectional detail on an enlarged scale.

Throughout the several views similar reference characters will be used for referring to the same parts and the sections are taken looking in the directions of the small arrows.

The embodiment of our invention disclosed herein comprises a cup- or bowl-

shaped receptacle 5 that is preferably formed of glass. The open end of this receptacle is closed by a cap comprising the connection block 6 and the annular sheet metal portion 7 that is adapted to form sealed contact with the edge of the open end of the receptacle 5. A gasket 8 may be employed for effectively sealing the joint between the cap and the receptacle.

The connection block 6 has formed therein an inlet passageway 9 that opens at 9' at a point eccentric of the filter. This passageway includes a valve seat 10 with which the valve 11 is adapted to co-act to prevent the drainage of fuel from the fuel system when the receptacle is removed for the purpose of cleaning or for replacing the filter element. The valve 11 has a stem 12 that is threaded in a bushing 13 forced into the bore 15, formed in the connection block. A suitable gasket 16 and a gland 17 may be used for preventing the leakage of fuel along the valve stem. The outer end of the stem is provided with a handle 18 by which it can be rotated.

Housed within the receptacle 5 is a filter element comprising a disc 20 having a central opening for receiving the extension 6' of the connection block. A plurality of spring bows 21 have their ends riveted, or otherwise secured, in the disc 20 adjacent the edge thereof and extend downwardly to form a supporting structure for the filter fabric 22. The upper edge of this filter fabric is confined between the edge of the disc 20 and an annular channel 23 (see Figure 4). The annular channel comprises a plurality of inwardly extending extensions 24 that project between adjacent bows 21 and thus form convolutions in the filter fabric. Preferably, these extensions are turned downwardly, as shown at 25, to prevent the edges thereof from cutting into the filter fabric.

At several points openings are formed through the extensions 24, the disc 20 and the filter fabric, and eyelets 26 are inserted in these openings and swedged over at the ends, as shown in Figure 4, for the purpose of tightly securing these several elements together and forming passageways for con-

necting the inlet passageway 9—9' with the interior of the receptacle 5.

The filter element just described is more completely described and claimed in the co-pending application of George F. Thomas, filed the 30th day of November, 1925.

The means that we provide for holding the cap onto the receptacle 5 comprises a stiff wire bail 27 having its ends inturned, as shown at 28, to provide pivot points received in suitable openings in the flange of the cap 7. A stirrup, comprising the two side members 29, is mounted on the bail at substantially the central point of the bight of the bail, being provided for this purpose with slots 30 that permit a limited movement of the stirrup transversely of the bail. A lever 31, comprising the eccentric or cam portion 32 is pivotally mounted upon the bail between the sides of the stirrup, and comprises a flat portion 33, the function of which will later be referred to. For holding the stirrup and lever in the proper position we provide washers W, held in place by projections 34 upset from the bail. A spring seat 35 is secured to the bottom 36 of the stirrup and is adapted to contact with the bottom of the receptacle 5, when the stirrup is forced into the position shown in Figures 2 and 3, and clamp the cap tightly upon the receptacle. The receptacle 5 is preferably provided with an integral annular rib 37 to assist in properly positioning the spring seat 35 relatively to the receptacle.

It will, of course, be understood that when the lever is pulled downwardly the tension on the spring seat 35 is reduced to such an extent that the bail can be swung to one side to permit the receptacle 5 to be removed from the cap.

While we have described the details of construction of the preferred embodiments of our invention, it is to be clearly understood that our invention is not limited to these details of construction, but is capable of other adaptations and modifications within the scope of the appended claims.

Having thus described our invention, what we claim is:

1. A filter comprising an open-ended receptacle, a cap for said receptacle comprising an annular sheet metal portion having means for making sealed connection with the edges of the open end of said receptacle, and a connection block extending through said annular portion and having inlet and outlet passageways therethrough, a filter element in said receptacle forming a filtering means between said inlet and outlet passageways, and means for securing said cap to said receptacle comprising a bail having its ends pivoted on said annular portion and its bight positioned below the bottom of said receptacle, a stirrup mounted upon said bail and movable transversely of said bail, a spring seat

carried by said stirrup for engagement with the bottom of said receptacle, and a cam mounted on said bail between the sides of said stirrup, said cam having a flat edge for engaging the bottom of said stirrup.

2. A filter comprising an open-ended receptacle, a cap for said receptacle, and means for securing said cap to said receptacle comprising a bail having its ends pivoted on said cap and its bight positioned below the bottom of said receptacle, a stirrup mounted upon said bail and movable transversely of said bail, a spring seat carried by said stirrup for engagement with the bottom of said receptacle, and a cam mounted on said bail between the sides of said stirrup, said cam having a flat edge for engaging the bottom of said stirrup.

3. A filter comprising an open-ended frangible receptacle, a cap for said receptacle, and means for securing said cap to said receptacle comprising a bail having its ends pivoted on said cap and its bight positioned below the bottom of said receptacle, a spring seat for engaging the bottom of the receptacle, and a cam pivoted upon said bail at the bight thereof for forcing said spring seat into engagement with the bottom of said receptacle, said cam comprising means for locking it in the position in which it holds said spring seat against said receptacle.

4. A filter comprising an open-ended frangible receptacle, a cap for said receptacle, and means for securing said cap to said receptacle comprising a bail having its ends pivoted on said cap and its bight positioned below the bottom of said receptacle, a spring seat for engaging the bottom of the receptacle, a cam carried by said bail for forcing said spring seat into engagement with the bottom of said receptacle, a lever handle formed integrally with said cam and shaped to lie closely adjacent said receptacle when in operated position, and means for holding said cam in position to maintain said spring seat in contact with the bottom of said receptacle.

5. A filter comprising an open-ended frangible receptacle, a cap for said receptacle, and means for securing said cap to said receptacle comprising a bail having its ends secured to said cap and the bight thereof extending below the bottom of said receptacle, yielding means engaging the bottom of said receptacle, cam means pivotally carried by said bail for engaging said yielding means and thereby clamping said receptacle to said cap, and a lever handle for operating said cam means.

6. A filter comprising an open-ended frangible receptacle, a cap for said receptacle, and means for detachably securing said receptacle to said cap, comprising a bail pivotally and detachably secured to said cap, a

yielding concave member engaging the bottom of said receptacle, and adjustable positioning means connecting the bail and said member, whereby pressure may be exerted upon the bottom of said receptacle to clamp it to said cap.

7. A filter comprising an open-ended frangible receptacle, a cap for said receptacle, and means for securing said cap to said receptacle, comprising a bail pivoted to said cap having its bight extending below the bottom of the receptacle, a yielding concave member engaging the bottom of said receptacle, and means connecting said member and the bight of said bail whereby force may be exerted to clamp said receptacle to said cap.

8. A fuel filter comprising a head having inlet and outlet passageways formed therein and having a depending peripheral flange, a glass bowl having its upper end fitting within said flange and having a depression in its lower end, a filter between said bowl and head to strain fuel flowing between said inlet and outlet passageways, a bail pivotally secured to said head, a concave resilient element engageable in said depression in said bowl, and means connecting said bail and said element operable to yieldingly force said bowl upwardly against said head.

In witness whereof, we hereunto subscribe our names this 24th day of November, 1925.

GEORGE F. THOMAS.

OTTO J. HERB.

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