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G. F. THOMAS

FILTER

Filed Nov. 30, 1925

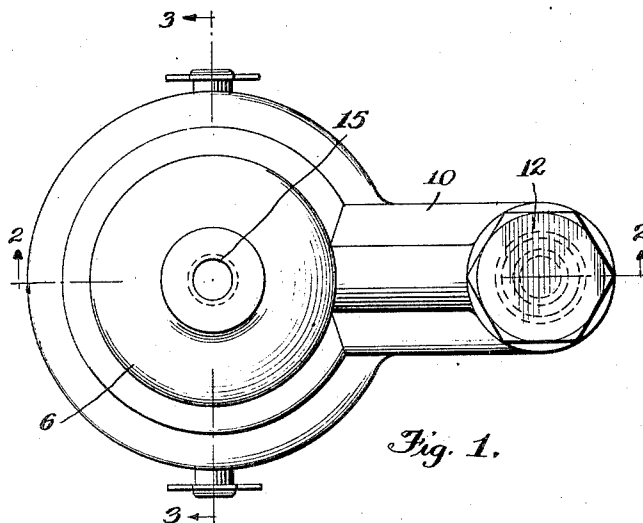


Fig. 1.

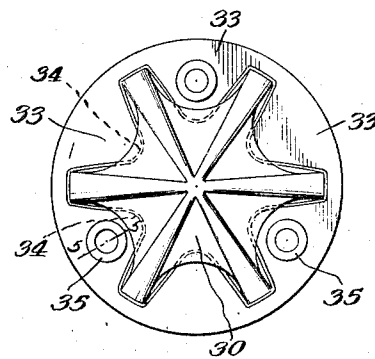


Fig. 4.

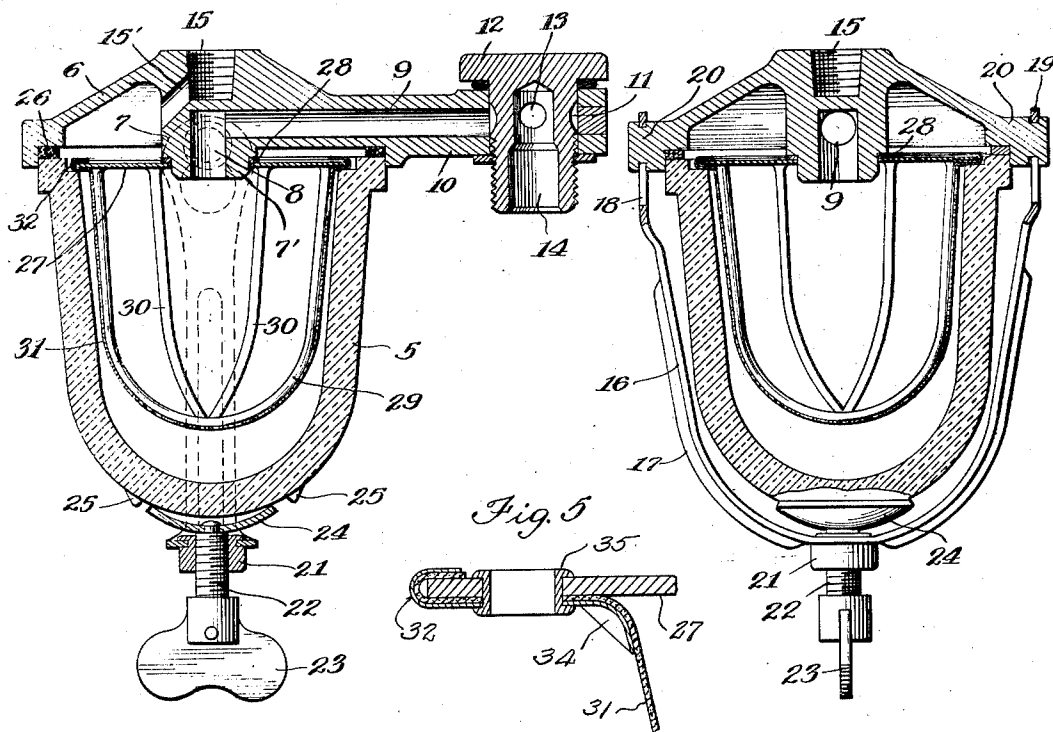


Fig. 2.

Fig. 3.

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UNITED STATES PATENT OFFICE.

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FILTER.

Application filed November 30, 1925. Serial No. 72,242.

My invention relates to improvements in filters and is particularly concerned with the provision of a novel type of filter for filtering a supply of fuel for an internal combustion engine. It will, however, be apparent, as this description progresses, that my improved filter is capable of being used for other purposes.

The objects of my invention are:

First, to provide a novel filter of simple construction that will be efficient in removing dirt, sediment, water, etc., from fuel for internal combustion engines;

Second, to provide a filter element for a filter such as described above; and

Third, to provide a filter and filter element, such as described, that is economical to manufacture.

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

Figure 1 is a plan view of my improved filter;

Figure 2 is a vertical section therethrough on line 2—2 of Figure 1;

Figure 3 is a vertical section taken on line 3—3 of Figure 1; and

Figure 4 is a bottom view of the filter element.

Figure 5 is a detail sectional view taken on the line 5—5 of Figure 4 and illustrates the means by which the filter bag is secured to the disc.

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

The embodiment of my invention disclosed herein comprises a cup- or bowl-shaped receptacle 5 that is preferably made of glass, or other transparent material, to enable the operator to ascertain when the filter requires cleaning. A cap 6 is provided for the open end of the receptacle 5. This cap comprises the inwardly extending boss 7 having the outlet passageway 8 that communicates with the passageway 9 in the supporting bracket 10. The passageway 9 communicates with an annular channel 11 in the plug 12, by means of which the bracket 10 is secured to a vacuum tank or other receptacle. Radially extending openings 13, formed in the plug, establish communica-

tion between the annular channel 11 and the bore 14 in the plug.

An inlet opening 15 is formed in the cap and discharges through the passageway 15' eccentrically of the cap.

For securing the cap to the receptacle I provide a bail 16 preferably formed of sheet metal and embossed, as shown at 17, to make it more rigid. This bail has keyhole shaped slots 18 formed in its free ends to be hooked over the reduced portions 19 of the lugs 20 that extend from opposite sides of the cap. A nut 21 is secured in the bight of the bail and carries a screw 22 having the winged thumb-piece 23 at its outer end for carrying a cup-shaped spring seat 24 at its inner end.

From the above description it will be apparent that the bail 16 can be swung on its pivots to permit the removal of the receptacle 5 and can then be returned to the position shown in Figures 2 and 3 when it is desired to clamp the cap and receptacle together. An annular flange 25, formed on the bottom of the receptacle, assists in positioning the seat 24.

A gasket 26, interposed between the edge of the open end of the receptacle 5 and the cap 6, provides a fluid-tight joint between these two elements.

My improved filter element for use with the construction described above comprises a disc 27 having a central opening for receiving the extension 7' of the boss 7. If desired, a gasket 28 may be interposed between the boss and the disc to seal the joint therebetween. One complete U-shaped bow 29 and a plurality of single bows 30 have their upper ends riveted or otherwise secured to the disc 27 adjacent the edge thereof. The lower ends of the bows 30 are soldered, spot-welded or otherwise secured to the middle point of the bow 29, as shown in Figures 2 and 3, so as to provide a rigid frame, or support, for a fabric filter bag 31. This fabric is preferably chamois, but may be woven wire or any other fabric suitable for the purpose for which the filter is designed. The edges of the filter bag 31 are clamped to the edges of the disc 27 by means of the annular metal channel 32. This channel has inwardly extending projecting portions 33 (see Figure 4) that form convolutions in the filter cloth. Preferably, these inwardly extending portions are turned

downwardly, as shown at 34, so as to prevent a broader bearing surface to the filter fabric and thus prevent undue wear upon the latter.

- 5 At several points openings are formed through the projections 33, the filter cloth and the disc 27 and eyelets 35 are inserted through these openings and swedged out-
 10 wardly so as to securely clamp the projec-
 tions 33 of the annular channel to the disc and at the same time these eyelets provide openings for conducting the fuel, or other
 15 fluid to be filtered, from one side of the disc to the other. In this manner fuel entering
 the filter through the passageways 15 and 15' can pass through the disc into the recep-
 20 tacle 5 and from thence through the filter fabric. The filtered fluid passes out through the passageways 8 and 9, while the dirt,
 sediment, water, etc., drop to the bottom of the receptacle 5. When the latter becomes
 25 filled with such impurities, the receptacle 5 can easily be removed from the cap, in the manner indicated above, cleaned and then replaced.

While I have described the details of construction of the preferred embodiment of my invention, it is to be clearly understood that my invention is not limited to these details, but is capable of other adaptations and modifications within the scope of the ap-
 30 pended claims.

Having thus described my invention, what I claim is:

- 35 1. A filter comprising a receptacle, a cap for said receptacle having an inwardly extending boss provided with an outlet pas-
 40 sageway, said cap having an eccentric inlet passageway, means for securing said cap to said receptacle, and a filter element in said
 receptacle comprising a disc having an opening for receiving said boss, a plurality of
 45 bows supported by said disc and extending downwardly therefrom, a filter fabric cover-
 ing said bows, and an annular channel clamp-
 ing the edge of said fabric to said disc and having projections extending between adja-
 cent bows for forming convolutions in said

fabric, said disc having openings there-
 50 through between said convolutions for the
 passage of fluid from said inlet to said re-
 ceptacle.

2. A filter comprising a receptacle, a cap for said receptacle having an inlet opening
 55 and an outlet opening, means for securing
 said cap to said receptacle, and a filter ele-
 ment in said receptacle comprising a disc
 having an opening in communication with
 60 said outlet and a filter fabric supported by
 said disc at its outer edge and extending
 downwardly into said receptacle, said disc
 having openings therethrough for the pas-
 sage of fluid from said inlet passageway to
 said receptacle, and below said filter ele-
 65 ments.

3. A filter element comprising a disc hav-
 ing a substantially central opening there-
 70 through, bows having their ends secured to
 said disc, a filter bag covering said bows and
 passing around the edges of said disc, an
 annular channel for clamping the edges of
 said filter bag to the edges of said disc and
 having projections extending between said
 bows for forming convolutions in said filter
 75 bag, said disc and projections having open-
 ings therethrough, and eyelets passing
 through said openings and clamping said
 projections to said disc.

4. A filter element comprising a disc hav-
 ing an opening therethrough, a filter bag
 80 having its edges clamped to said disc adja-
 cent the edge of said disc, and registering
 openings passing through said disc and por-
 tions of said filter bag.

5. A filter element comprising a disc hav-
 85 ing an opening therethrough, a filter bag
 supported by said disc, said disc and filter
 bag having registering openings there-
 through lying between projecting portions
 of said filter bag, and metallic eyelets pass-
 90 ing through said openings for securing said
 bag to said disc.

In witness whereof, I hereunto subscribe
 my name, this 24th day of November, 1925.

GEORGE F. THOMAS.