

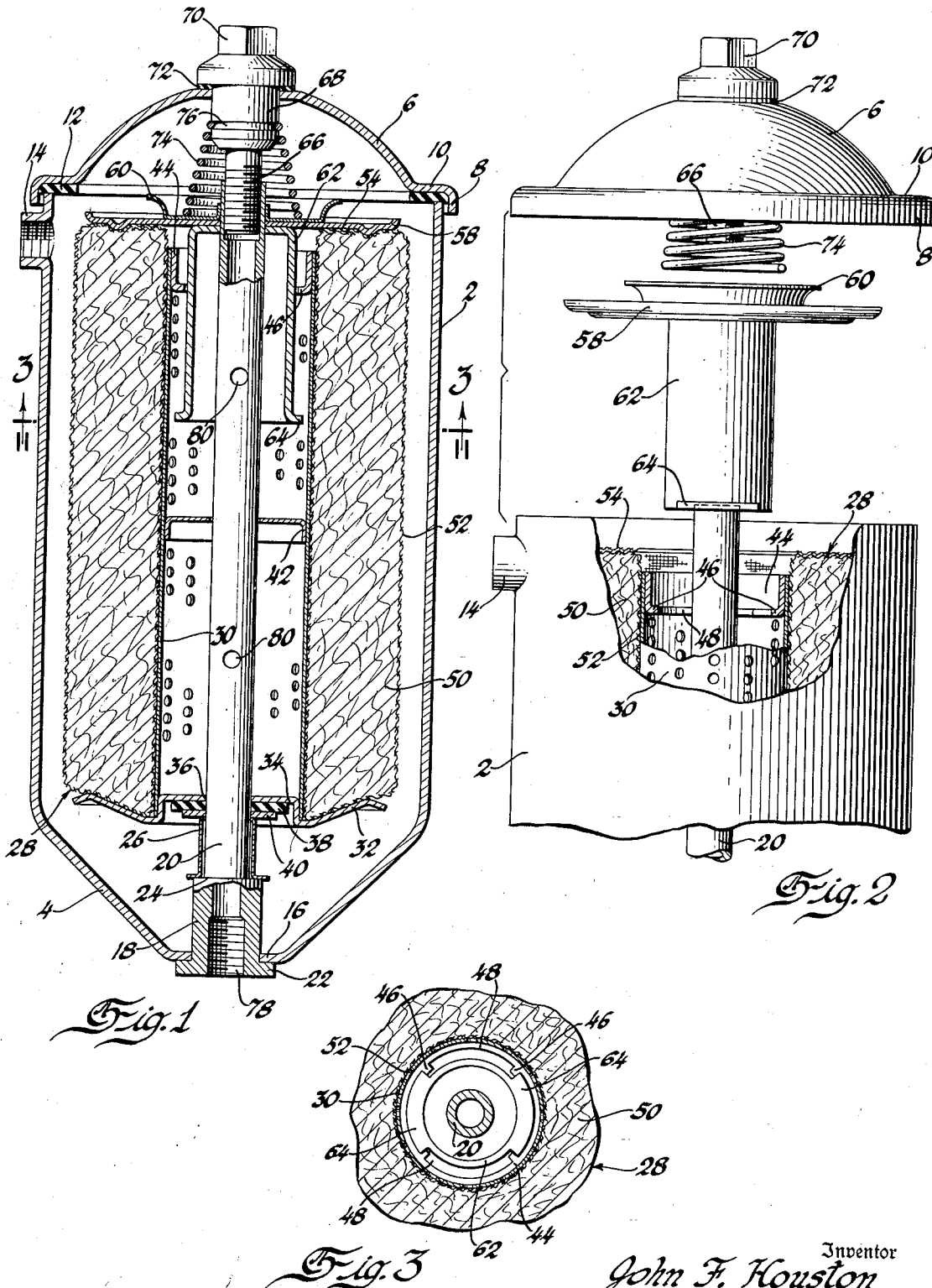
July 27, 1943.

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2,325,399

OIL FILTER

Filed July 13, 1940



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UNITED STATES PATENT OFFICE

2,325,399

OIL FILTER

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Application July 13, 1940, Serial No. 345,324

4 Claims. (Cl. 210—183)

This invention relates to oil filters used in connection with the internal combustion engine of an automotive vehicle.

The object of the invention is to provide an oil filter, the filtering element of which is readily replaceable. The novelty of the construction consists in providing a removable end plate held in position by a retainer secured inside a hollow column and by a cup removably engaged with the retainer and secured to the removable end plate.

On the drawing

Figure 1 is a sectional view through the filter. Figure 2 is an expanded view of the novel parts of the filter.

Figure 3 is a section on the line 3—3 of Figure 1.

Referring to the drawing, the numeral 2 indicates the container in which the filter is mounted. The container has the cone-shaped lower end 4 while the upper end is open and is closed by means of a top or cap 6. The cap has the edge flange 8 and a flattened portion 10. Under the flattened portion 10 a gasket 12 is positioned and this gasket is received over the edge of the open end of the container 2. The upper part of the container has the inlet 14.

The conical part 4 has the tip thereof flattened as indicated at 16 and this flattened part is provided with an opening in which there is received the enlarged end or head 18 of a tube 20. The head has the flange 22 which fits against the outer part of the flat 16, and if desired a gasket may be positioned between parts 16 and 22.

The tube 20 has a shoulder 24 and over the shoulder there is received the thimble 26 through which the tube 20 passes.

Inside the container 2 the filtering unit 28 is mounted. This unit comprises the central cylindrical screen 30 having an end plate 32 rigidly secured thereto. The end plate has the recessed part 34 which extends inside the cylinder 30. The recessed part 34 is provided with an opening 36 in order that the tube 20 may extend therethrough. Between the recessed part 34 and the end of the thimble 26 there are positioned the fabric gasket 38 and the metallic washer 40 to form a tight seal. The screen is further provided with the center positioning member 42 and the end retainer 44. Both elements 42 and 44 have openings through which the tube 20 may pass.

The retainer 44 is provided with diametrically opposite inwardly projecting tongues 46 defining recesses 48 therebetween.

A filtering material 50 of any suitable kind is positioned around the cylindrical screen 30, and a fabric 52 surrounds the filtering material both at the screen and at the outside of the filter. Any suitable filtering material such as mineral wool, cotton batting, cotton linters, wood pulp, paper pulp, etc., may be used. The filtering fabric is preferably folded over at its top as indicated at 54 so that the ends of the filter bag will overlap. See the copending application of Herbert G. Kamrath, Oil filter, filed July 13, 1940, Serial No. 345,313 now Patent No. 2,301,121.

At the upper end of the filter the end plate 58 is not secured to the cylindrical screen 30 but is separable therefrom and has rigidly secured thereto the handle 60 and the cup 62. The cup has the laterally projecting ears 64 positioned diametrically opposite each other and these ears are adapted to be received in the recesses 48 in the retainer 44.

After the ears 64 have been passed between the tongues 46, the handle 60 is rotated to bring the ears 64 and tongues 46 into overlapping relation to prevent the withdrawal of the removable end 58. The bottom of the cup 62, the plate 58, and the handle 60 are provided with openings in order that they may be received over the end of the tube 20.

The upper end of the tube 20 is internally screw-threaded to receive the threaded end 66 of a bolt 68 the head 70 of which is exterior to the cover 6.

A conically shaped coil spring 74 has one end fitting in a groove 76 in the bolt 68 and the other end pressing on the handle 60 tightly to compress the removable end plate 58 against the upper edge of the filtering material 52.

A gasket 72 is positioned between the head 70 and the cover 6, and by applying a tool to the head 70 the bolt may be tightened to cause the cap 66 to fit tightly on the container 2.

Assuming that the parts are in the position shown in Figure 1, and it is desired to remove the filtering material 50, the first operation will be to loosen the screw 68 so that its threads 66 are removed from the internal threads on the tube 20. This will enable the cover 6 to be removed, and after the cover has been removed the operator may seize the handle 60 and lift the screen 30, filtering material 50, and end plate 32 from the container 2. The reason the operator may lift these parts from the container is that the flanges 64 on the cup engage with the flanges 46 on the retainer. After the filtering unit 28 has been withdrawn from the container,

the cup 62 may be rotated to cause the flanges 64 thereon to mate with the recesses or spaces 48 in the retainer which will enable the removal of the end plate and the cup. The filtering material 50 may now be removed entirely from the filter screen 30 and a new filtering material applied. The operation of placing the end plate on the filtering unit 20 and closing the retainer embodies the reverse steps used in removing the filtering material.

The outlet of the filter is indicated at 78. The tube has the openings 80 within the cylindrical screen 30 to allow the filtered oil to pass there-through and from the exit 78. The oil enters at 14, completely surrounds the filtering material 50, passes through the material and into the screen 30. The filtered oil then passes through the openings 80, to the outlet 78.

I claim:

1. In an oil filter, a removable filter element comprising a hollow perforated column, a plate rigidly secured to one end of the column, a removable plate at the other end of the column, filtering material between the plates and surrounding the column, a retainer secured in the column, a cup secured to the removable plate and extending into the column and adapted to be removably engaged with the retainer, the removal of said removable plate enabling the filtering material to be removed and replaced, a container in which the filter is mounted, means between the container and the removable plate to cause the plate to be kept in contact with the filtering material, an inlet in the container to enable the oil to have access to the exterior of the filtering material, and means inside the column and extending to the outside of the container to enable the filtered oil to leave the filter.

2. In an oil filter, a removable filter element comprising a hollow perforated column, a plate rigidly secured to one end of the column, a removable plate at the other end of the column, filtering material between the plates and surrounding the column, a retainer secured in the column, a cup secured to the removable plate and extending into the column and adapted to be removably engaged with the retainer, the removal of said removable plate enabling the filtering material to be removed and replaced, a

container in which the filter is mounted, said container having an inlet to enable oil to have access to the exterior of the filtering material, means between the container and the removable plate to cause the plate to contact with the filtering material, and a perforate outlet tube closed at one end and passing through the column and the end plates and being secured to the container at both its ends to hold the filter in the container.

3. In an oil filter, a removable filter element comprising a hollow perforated column, an end plate secured to one end of the column, a removable plate at the other end of the column, a filtering material between the plates and surrounding the column, a retainer mounted in the column, a cup secured to the removable end plate and extending into the column, interconnecting means between the cup and the retainer, said interconnecting means being detachable to enable the cup and end plate to be removed from the retainer to enable the filtering material to be removed and replaced, means to mount the column and plates in a container, a removable cover on the container, an inlet to the container, and an outlet tube extending through the plates and the column and having its delivery end outside the container.

4. In an oil filter, a removable filtering element comprising a hollow perforated column, an end plate secured to one end of the column, a removable plate at the other end of the column, a filtering material between the plates and surrounding the column, a retainer mounted in the column, a cup secured to one end plate and extending into the column, recessed parts in the retainer, tongues on the cup, said tongues capable of passing through the recessed parts to enable an interengagement of the cup and the retainer, said recess and tongue connection enabling the cup to be removed from the retainer to enable the filtering material to be removed and replaced, means to mount the column and plates in a container, said container having a removable cover, an inlet to the container, and an outlet tube closed at its inner end and extending from the interior of the column to the outside of the container.

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