Jan. 17, 1939. P. F. VICTOR 2,144,444

FILTERING DEVICE

Filed July 23, 1936

Fig. 1

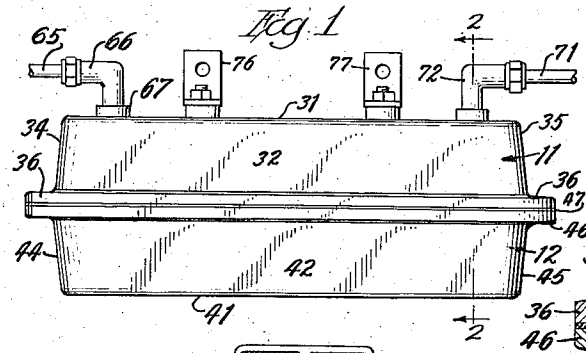


Fig. 2

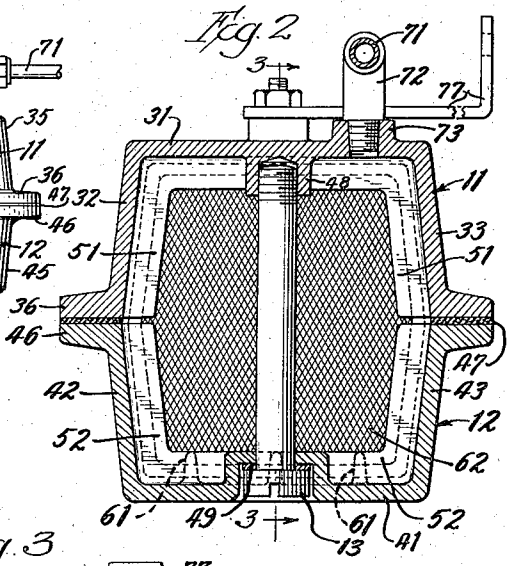


Fig. 6

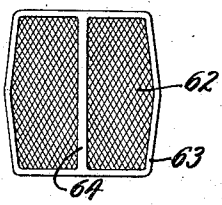


Fig. 3

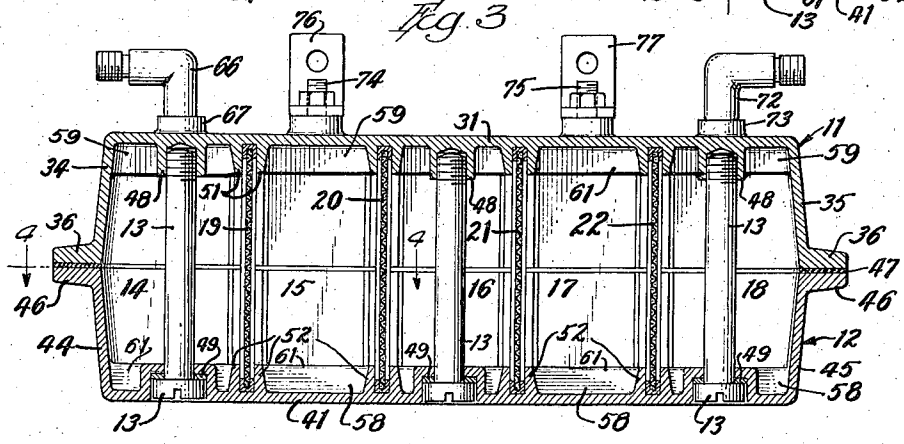


Fig. 4

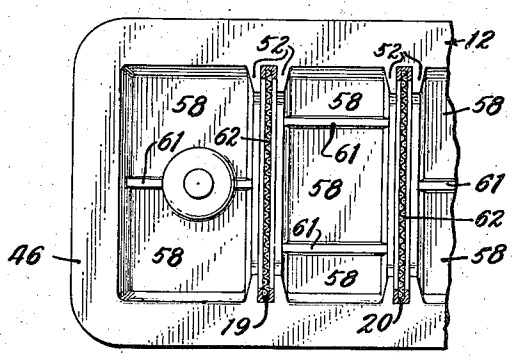
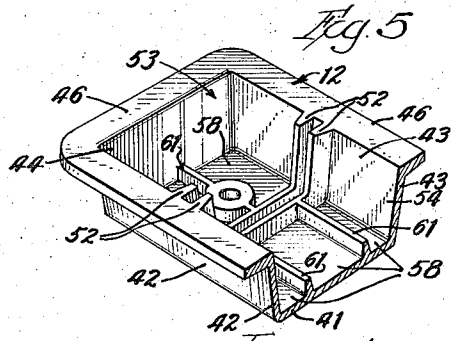


Fig. 5



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FILTERING DEVICE

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Application July 23, 1936, Serial No. 92,180

4 Claims. (Cl. 210—164)

This invention relates in general to a filtering device and more particularly to such a device which is adapted for filtering the lubricant or fuel of machines such as internal combustion engines and the like.

An important object of the invention is to provide such a device embodying a series of settling compartments and dividing means separating the compartments and constructed to form obstructive filtering devices whereby a liquid may be conditioned as an incident to passage through the filtering device.

Another important object of the invention is to provide such a device having traps or pockets wherein light and heavy particles of matter may be isolated.

Other objects such as the economy of construction, the accessibility for cleaning and renewal of parts upon occasion, and the arrangement of the parts which facilitates self cleaning action with respect to the obstructive filtering devices, will be apparent as the invention is better understood from the following description, which, taken in connection with the accompanying drawing, discloses a preferred embodiment thereof.

Referring to the drawing;

Figure 1 is an elevational view of a device embodying my invention.

Figure 2 is a transverse sectional elevation taken substantially on line 2—2, in Figure 1, and illustrating details of construction.

Figure 3 is a longitudinal elevational section taken substantially on line 3—3, in Figure 2, further illustrating details of construction.

Figure 4 is a fragmentary section taken substantially on line 4—4, in Figure 3 and illustrating the sump pockets and the means of support for the obstructive filtering devices in one of the body parts.

Figure 5 is a perspective view of the portion of the body part shown in Figure 4, and;

Figure 6 is a detail view of one of the obstructive filtering devices.

To illustrate my invention I have shown a body formed of companion parts 11 and 12, of similar form suitably secured together by means of threaded screws 13, and transversely divided to form a series of settlement compartments 14, 15, 16, 17 and 18, by means of dividers 19, 20, 21 and 22.

The body may be formed of any two parts adapted to form an enclosure and in the present embodiment I have shown the parts 11 and 12, molded or cast to similar form and so that when secured together as shown in (Figures 1, 2 and 3) an oblong chamber is formed. The part 11, includes a top wall 31, side walls 32 and 33, end walls 34 and 35, and an abutment flange 36 located at the extremities of the walls 32, 33, 34 and 35, and extending laterally therefrom. The part 12 similarly includes a bottom wall 41, side walls 42 and 43, end walls 44 and 45, and an abutment flange 46.

A suitable sealing gasket 47 is arranged between the abutting flanges 36 and 46, and, as above mentioned, the parts 11 and 12 are secured together by means of the screws 13 which extend through suitable apertures in the wall 41 of the part 12 and have threaded engagement in threaded bosses 48 extending from the wall 31 of the part 11. The heads of the screws 13 may be countersunk below the surface of the wall 41 and suitable gaskets 49 may be provided to prevent leakage.

In accordance with this invention the body is divided transversely by means of the dividers 19, 20, 21 and 22 as above described and to provide a means for locating and securing these dividers, spaced and substantially parallel webs 51 are formed to extend from the walls 31, 32 and 33 of the body part 11, and corresponding webs 52 are formed to extend from the walls 41, 42 and 43 of the body part 12 in alignment with the webs 51 in the body part 11. The webs 51 and 52 being spaced to form a pocket in which one of the dividers may be interlockingly engaged upon the assembly of the body parts 11 and 12. These webs are arranged at intervals along the body so that when the dividers are assembled in the body it is divided thereby into the separate settlement compartments 14, 15, 16, 17 and 18.

The webs 51 and 52 are relatively high so that a substantial sediment sump 58 or pocket is formed in the bottom of each one of the compartments 14, 15, 16, 17 and 18 for the accumulation of heavy particles of matter or sediment and a similar pocket 59 is formed at the top of each one of said compartments wherein foam and particles of matter of less specific gravity than the liquid to be conditioned may be collected. Longitudinal webs 61 are or may be formed in the sump or pockets 58 and 59 as indicated to minimize the effect of any transverse or rotary movements, of the liquid being conditioned, with respect to materials contained or collected in the pockets 58 and 59.

The dividers 19, 20, 21 and 22 may be any suitable obstructive filtering devices capable of obstructing the passage of solid particles of mat-

ter such as a mesh fabric or a porous or pervious material or a suitable combination thereof. In the present embodiment I have shown (Figs. 2, 3 and 6) such a device formed of a wire mesh fabric, part 62, suitably mounted in a rigid frame 63 of suitable metal. The frame 63 is shaped to fit in between the webs 51 and 52 and to be rigidly interlocked therein upon the assembly of the body parts 11 and 12, as illustrated (Figs. 2, 3 and 4). Suitable reinforcing webs such as a web 64 extending across the mesh 62, may be provided for reinforcing the mesh.

In order to distribute the filtering action the gage of the mesh 62 is progressively varied from a relatively course mesh in the divider 19 to a relatively fine mesh in the divider 22.

Liquid to be conditioned is admitted to the compartment or sediment chamber 14 from a tube line 65 connected to the body part 11 by means of a tube fitting 66 having threaded engagement in a boss 67 formed therein. The liquid then passes successively through the series of settlement compartments for conditioning and is then discharged from the compartment 18 to a tube line 71 which is similarly connected to the body part 11 by means of a tube fitting 72 having threaded engagement in a boss 73 formed therein.

The tube line 65 may be connected to a source of fuel supply or to an oil sump in a machine and the tube line 71 may be connected to a corresponding pump for delivering the conditioned liquid to the engine or machine.

Suitable mounting screws 74 and 75 may be cast into the body part 11 as inserts and to facilitate the attachment of the body to a machine through support brackets 76 and 77 as indicated (Figs. 1, 2 and 3).

Due to the relatively large capacities of the sediment chambers 14, 15, 16, 17 and 18 in proportion to the inlet and outlet tube lines 65 and 71 the flow of liquid between compartments is relatively slow and permits any particles of foreign matter to either precipitate into one of the sumps 58 or to float into one of the pockets 59. Forward movement of the particles is also obstructed by the dividers 19, 20, 21 and 22 in accordance with the mesh of the screens 62 mounted therein so that the finer particles are allowed a more extensive period of time to settle or float out while the more coarse particles are allowed a shorter period of time.

When a device embodying this invention is attached to an automobile engine road irregularities tend to set up a rotary flow of the liquid within the filtering device and about the longitudinal axis thereof. This rotary flow is beneficial because it effects a washing action at the surfaces of the dividers 19, 20, 21, and 22 and the longitudinal webs 61 reduce the effect of this action in the sumps 58 so that the accumulated sediment will not be washed therefrom.

It will be noted that the body may be readily dissembled for cleaning or replacement of parts by the simple operation of removing the screws 13 and separating the parts 11 and 12.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction, and arrangement of the parts without departing from the spirit and scope of the invention, or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. A liquid filtering device of the type wherein liquid to be filtered is passed through a hollow body which is transversely divided to form a series of settling chambers comprising, two similar parts having cavities therein and adapted to be secured together to form a hollow body, a series of transversely disposed channels formed in both of said parts and to register upon assembly thereof, and screen devices arranged for interlocked engagement in said channels to transversely divide the body for forming settlement chambers.

2. A liquid filtering device of the type wherein liquid to be filtered is passed through a hollow body which is transversely divided to form a series of settling chambers comprising, two similar parts having cavities therein and adapted to be secured together to form a hollow body, a series of transversely disposed channels formed in both of said parts and to register upon assembly thereof, and a plurality of screen devices having marginal frames thereon formed in accordance with registered channels in said body and to engage in said channels upon assembly of the body whereby said body is transversely divided to form a plurality of settlement chambers.

3. A liquid filtering device of the type wherein liquid to be filtered is passed through a hollow body which is transversely divided to form a series of settling chambers comprising, two similar parts having cavities therein and adapted to be secured together to form a hollow body, a series of transversely disposed channels formed in both of said parts and to register upon assembly thereof, screen devices arranged for engagement in said channels to transversely divide the body for forming settlement chambers, and means for securing the body parts together in assembled relationship including threaded screws extending through the settlement chambers.

4. A filtering device for machines comprising a two part body, and a plurality of mechanical filtering devices shaped to conform to the cross-sectional form of said body, each one of the parts of said body having a plurality of transversely disposed webs formed therein in alignment with corresponding webs in the other body part and forming therewith continuous locating channels for receiving the mechanical filtering devices whereby the mechanical filtering devices may be secured in operative relationship and to form a series of settlement compartments within the body upon the assembly of the body parts.

PAUL F. VICTOR.