March 1, 1927.

1,619,118

H. L. GUY ET AL

FILTER

Filed April 10, 1920

Fig. 1.

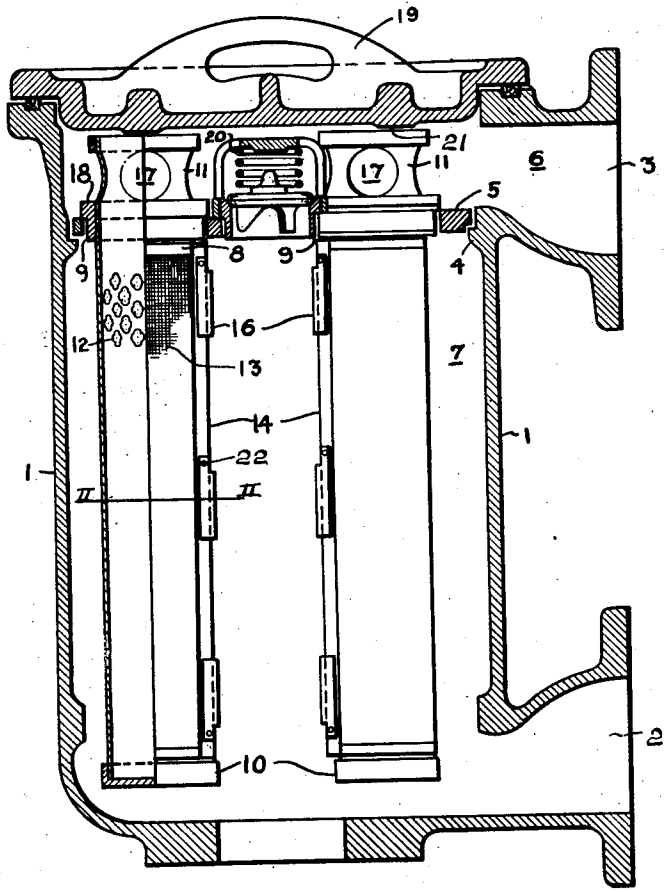
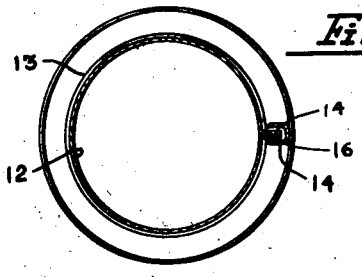


Fig. 2.



INVENTOR.
Henry Lewis Guy &
Thomas Blacklock
BY J. C. Davis
ATTORNEY

Patented Mar. 1, 1927. 1,619,118

UNITED STATES PATENT OFFICE.

HENRY LEWIS GUY AND THOMAS BLACKLOCK, OF MANCHESTER, ENGLAND, ASSIGNORS TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

FILTER.

Application filed April 10, 1920, Serial No. 372,922, and in Great Britain April 15, 1919.

Our invention relates to oil filters and more particularly to devices of this character used for filtering or straining oil employed in lubricating systems.

The object of the invention is to provide a filter of the character described which may be easily assembled and dismantled and which is efficient in operation.

Another object of the invention is the provision of an improved strainer element which is simple in construction and may be easily and cheaply made.

In the accompanying drawings Fig. 1 is a central vertical section of an oil filter constructed in accordance with the invention, Fig. 2 being a section to an enlarged scale taken on the line II—II of Fig. 1.

Referring to the drawings, the filter comprises a vertical chamber 1 having flanged inlets 2 and outlets 3 for the oil located respectively near the bottom and top of the chamber, preferably at the side thereof. The interior of the chamber 1 is provided near its upper end below the oil outlet with a ledge 4 adapted to support a diaphragm or plate 5 dividing the chamber into an upper and a lower portion 6 and 7. The diaphragm or plate 5 supports one or more oil strainers 8 in position within the chamber 1 and for this purpose is provided with a corresponding number of apertures 9 through which the oil strainers 8 project. The latter are constructed somewhat in the form of a cartridge and comprise a base 10 and a head piece 11 connected by an intermediate portion of perforated metal 12 for example. On the exterior of the latter is wrapped a sheet of wire gauze 13 which forms the straining material. The edges of the wire gauze 13 are preferably reinforced by strips of sheet metal 14, and the meeting edges form a vertical butt joint being bent or otherwise so shaped as to be readily secured in position by means of clips 16 or the like.

The clips 16 are formed of strips of metal, pressed into channel shape and apertured to embrace the butt joint formed by the meeting edges of the metal strips 14. They are attached to one of the meeting edges by any suitable means, such as the rivets 22, forming a pivot by which they may be moved into and out of locking engagement with the butt joint, thus facilitating the application and removal of the wire gauze sheet 13.

The head pieces 11 of the strainers are provided with lateral orifices 17 below which is a flange 18 of somewhat greater diameter than the aperture 9 in the diaphragm or plate 5 through which the strainers 8 project. The lid or cover 19 of the filter chamber is provided on its inner face with projections 21 which abut against the heads 11 of the strainers 8 when the cover 19 is closed, thereby holding the strainers 8 in position in the diaphragm 5. The strainers 8 may be of any suitable shape but are conveniently cylindrical.

One or more loaded non-return valves 20 are provided in the diaphragm 5, the purpose of which is to prevent the flow of oil through the filter from being interrupted in the event of the strainer surfaces becoming choked up.

In operation the oil enters the filter chamber 1 through the inlet 2 at its lower end and passes through the wire gauze 13 into the interior of the strainers, flowing upwards through them and passing out through the lateral orifices 17 in their heads 11 into the portion of the filter chamber 6 above the diaphragm and thence through the outlet 3 leading from the filter chamber at its upper end.

Occasionally it may be necessary or desirable to reverse the direction of the flow of oil through the filter from that described above. To provide for this the loaded non-return valves 20 in the diaphragm 5 may be made reversible, or an additional valve or valves arranged to open in the reverse direction may be located in the diaphragm 5.

The construction hereinabove described is such as to permit of all the parts within the filter being fitted with sufficient clearance to prevent them becoming jammed in any way so that they may be withdrawn and replaced without difficulty. The number of individual strainers employed will vary according to the area of straining surface which has to be provided and where the latter is considerable, the number of strainers employed may, with advantage, be increased in order that the weight of the individual strainers may not become excessive and thus prevent their being easily handled.

While we have shown our invention in but one form, it will be obvious to those skilled in the art that it is not so limited but is susceptible of various other changes and modifications without departing from the spirit thereof and we desire, therefore, that only such limitations shall be placed thereupon as are imposed by the prior art or as are specifically set forth in the appended claims.

What we claim is:

1. A filter comprising a filter chamber, a diaphragm removably supported within the chamber and dividing the chamber into inlet and outlet compartments, a filter element mounted in the diaphragm through which fluid normally passes from the inlet compartment to the outlet compartment, and a relief valve carried by the diaphragm and adapted to pass fluid therethrough in parallel with said filter element upon clogging of the latter.

2. A filter comprising a casing providing a chamber and having inlet and outlet openings communicating therewith, a removable cover for said casing, a diaphragm disposed in the chamber between the inlet and outlet openings, and filter elements and a relief valve mounted in the diaphragm, the diaphragm being held in position by means including the cover and being capable of removal upon removal of the cover.

3. A filter comprising a casing providing a chamber and having inlet and outlet openings communicating therewith, an abutment in said chamber between the inlet and outlet openings, a diaphragm disposed against said abutment and dividing said chamber into inlet and outlet compartments, the diaphragm being provided with openings, filter elements removably seated in openings in the diaphragm, a relief valve carried by the diaphragm and adapted to pass fluid therethrough in parallel with said filter element upon clogging of the latter, the chamber being provided with an opening through which the diaphragm may be inserted and removed and a cover for said opening, the cover when closed abutting against the filter elements and thereby retaining the filter elements in the diaphragm and the diaphragm against the abutment.

4. In an oil filter, an elongated filter element comprising an apertured inlet portion and an apertured outlet portion, filtering means covering one of said apertured portions, said filtering means provided with reinforced meeting edges, and one or more clip elements pivoted to one of said edges and having a channel-like portion adapted to fit over the meeting edges to hold the filtering means in position.

In testimony whereof, we have hereunto subscribed our names this twelfth day of March, 1920.

HENRY LEWIS GUY.
THOMAS BLACKLOCK.