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2,313,307

CONNECTOR FOR SECTIONS OF FILTER CARTRIDGES

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Fig. 1.

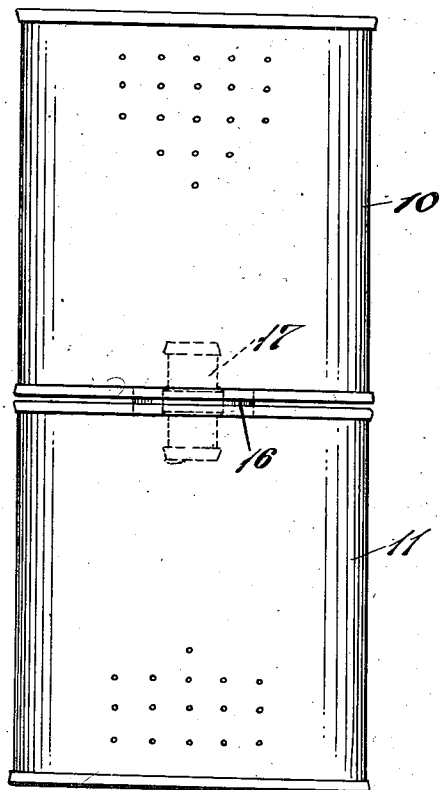


Fig. 2.

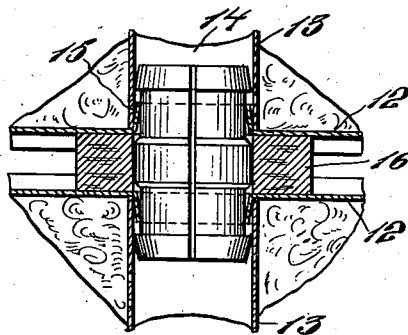


Fig. 3.

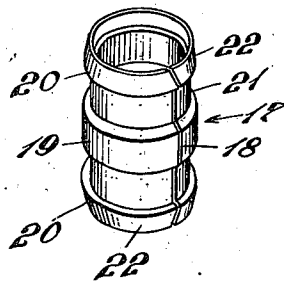
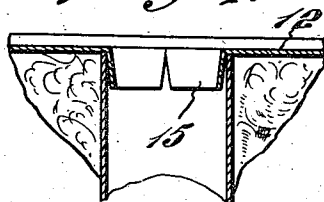


Fig. 4.



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CONNECTOR FOR SECTIONS OF FILTER
CARTRIDGESJames W. Wilkinson, Providence, R. I., assignor
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Application November 25, 1939, Serial No. 306,121

6 Claims. (Cl. 210—62)

This invention relates to a filter, more particularly of the type of filter used for filtering lubricant in internal combustion engines, and has for one of its objects to provide an arrangement whereby cartridges may be inserted into or removed from a filter casing where the space in which the casing is mounted is so limited as to prevent complete vertical withdrawal of the cartridge from the casing by reason of their being insufficient height above the casing for such removal of the cartridge.

Another object of the invention is to provide an arrangement whereby two or more cartridges may be assembled one on top of the other by a clip which in effect makes the two a single cartridge for operating purposes.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described, and particularly pointed out in the appended claims.

In the accompanying drawing:

Fig. 1 is a side elevation of an assembly of cartridges by means of the clip of my invention.

Fig. 2 is a fragmental sectional view of the adjacent portions of two cartridges.

Fig. 3 is a perspective view of my clip alone.

Fig. 4 is a fragmental sectional view of the upper end of one of the cartridges.

When the head room above a filter casing is so limited that a tall cartridge may not have sufficient room for the removal of the cartridge from the casing without removal of the other parts I use a plurality of shorter length cartridges. The cartridges may be installed as sections in the filter within the two or three inches of its depth and held there by a clip until two or three other cartridges or sections have been serially attached, and when it is desirable to remove the cartridges, cartridges may be lifted together to a height sufficient to break off the top cartridge and then lift the top cartridge and repeat the operation until all the cartridges are removed one from the other. By placing a gasket between the cartridges, the cartridge sections are held together to act as a single cartridge; and the following is a more detailed description of the present embodiment of this invention, illustrating the preferred means by which these advantageous results may be accomplished:

With reference to the drawing, 10 designates one cylindrical cartridge and 11 another cylindrical cartridge, each of which is provided with a cylindrical vertical wall with perforations therein and end walls 12. Each of these cartridges is also provided with a perforated central

tubular member 13 providing an opening 14 axially through the cartridge. Each end wall is provided with inturned fingers 15 extending diagonally inwardly as illustrated more particularly in Fig. 4.

Such cartridges may be very easily attached one to the other by placing a central gasket 16 of some resilient material such as cork between the end walls 12 and then attaching a clip 17 as shown in Fig. 3, consisting of a sheet of stock rolled into cylindrical form and split as at 18. The contour is formulated with a broad central rib 19, and end ribs 20 raised from the cylindrical stock 21 thereof, the ends 20 tapering to a smaller diameter along the outer surface 22, as illustrated more particularly in Fig. 3.

By this arrangement the tapered ends 22 may be inserted into one tube 13 and beneath the spring fingers 15, while the other tapered end may be inserted into the other tube 13 and beneath its fingers 15, these fingers will engage the shoulder back of the ribs 20 so as to lock the two cartridges together which are sealed by reason of their intimate contact of the end walls 12 with the gasket 16 which will be of cork or some suitable resilient structure which will withstand oil or the filtrate material which is to be passed through the filter.

The foregoing description is directed solely towards the construction illustrated, but I desire it to be understood that I reserve the privilege of resorting to all the mechanical changes to which the device is susceptible.

I claim:

1. In combination with a pair of filter cartridges arranged in axial alignment substantially end-to-end for use in a single filter casing, each comprising a cylindrical can having inner and outer perforate cylindrical walls between which is disposed suitable filtering material, end walls provided with central openings and closing the space between said inner and outer walls, of a connection tube forming a common fluid conduit between said cartridges and having its opposite tubular end portions extending through the central openings in the opposed end walls of said cartridges into the axial space inside of the cartridges adjacent said central openings and enclosed by said inner cylindrical walls, and means carried by each cartridge extending inwardly into the central axial space thereof from its central opening and arranged about the respective tubular end portion of said connection tube to coact therewith and lock the connection tube in position.

2. In combination with a pair of filter cartridges arranged in axial alignment substantially end-to-end for use in a single filter casing, each comprising a cylindrical can having inner and outer perforate cylindrical walls between which is disposed suitable filtering material, end walls provided with central openings and closing the space between said inner and outer walls, of a connection tube forming a common fluid conduit between said cartridges and having its opposite tubular end portions extending through the central openings in the opposed end walls of said cartridges into the axial space inside of the cartridges adjacent said central openings and enclosed by said inner cylindrical walls, and means carried by each cartridge extending inwardly into the central axial space thereof from its central opening and arranged about the respective tubular end portion of said connection tube to coact therewith and lock the connection tube in position, said connection tube having one wall portion split its entire length to provide a slot for permitting the tube to contract and expand, and a gasket surrounding said tube between said cartridges held in compressed relation by said connecting tube.

3. In combination, a pair of filter cartridges each having an end wall with a central opening therethrough a central tube in communication with said openings, resilient fingers integral with said end wall and extending into said center tube adjacent said opening, and a connection tube having exterior abutments thereon extending through the central opening of said end wall inside of the center tube of each of said cartridges to engage the ends of said fingers and lock said cartridges together.

4. In combination, a pair of filter cartridges each having an end wall and a central opening therethrough a center tube in communication with said openings, resilient fingers integral with said end wall extending into said center tube adjacent said opening, and a split connection tube having abutments thereon extending through the central opening of said end wall inside of the center tube of each of said cartridges to engage

the ends of said fingers and lock said cartridges together and having an inherent tendency to expand and a gasket surrounding said tube between said cartridges held in compressed relation by said connecting tube.

5. In a combination, a pair of filter cartridges each having an end wall and a central opening therethrough a center tube in communication with said openings, a connection tube extending through the central opening of said end wall inside of the center tube of each of said cartridges, means on each of said cartridges within the opening thereof arranged to coact with and lock the connection in position, and a resilient gasket about said connection tube and snugly engaging the opposed end walls of said cartridges to seal the flow line from one cartridge to another.

6. A connector for a pair of cylindrical filter cartridges which are to be connected together in end-to-end relationship and to form a common fluid conduit between them in which each cartridge has an end wall provided with a central opening a center tube in communication therewith and disposed axially of the cartridge into which is to extend a telescoping part of said connector in the assembled relationship of the parts, and resilient metal fingers surrounding said central opening and projecting inwardly into the center tube about the adjacent end thereof, said connector comprising a compressible gasket tubular member extending through the gasket and having a longitudinal slot extending the entire length of said member and formed through one side thereof, and including a broad central circumferential rib and a cylindrical telescoping part of smaller diameter arranged at opposite sides of said central rib with circumferential end ribs at the free ends of said telescoping parts to provide shoulders for engaging the ends of said fingers when the telescoping parts are inserted through said central openings into the center tubes of the cartridges with the end ribs positioned behind said fingers, the outer surfaces of said end ribs being tapered to a smaller diameter toward the ends of said member.

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