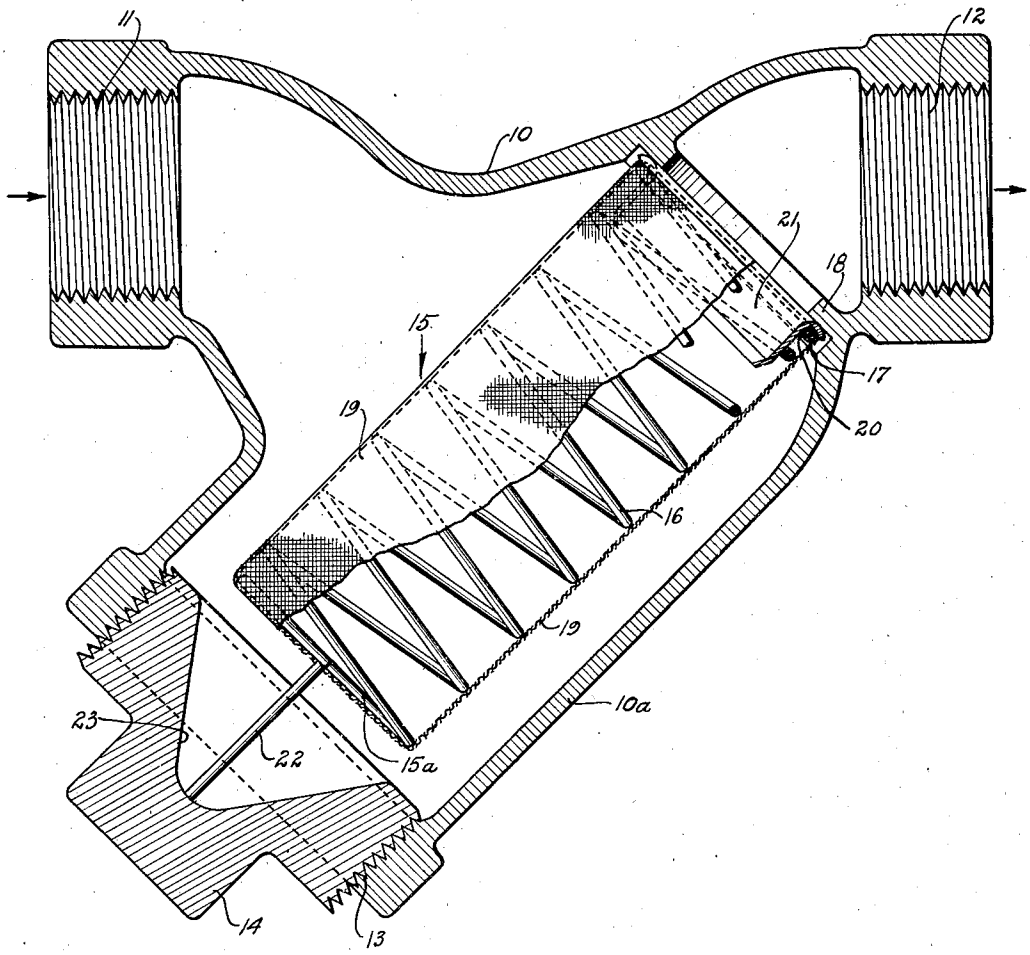
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GAS FILTER

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Inventors.
Ernst J. Dahlen.
Karl W. Westlund.

Attorney.

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GAS FILTER

Karl W. Westlund, Huntington Park, and Ernst J. Dahlen, Inglewood, Calif., assignors to Ensign Carburetor Co. Ltd., Huntington Park, Calif., a corporation of California

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3 Claims. (Cl. 183—51)

This invention relates generally to gas filters adapted to be used, for example, in filtering gaseous fuel supplied to internal combustion engines. Familiarity with the invention as given by the description to follow, will suggest its utility in conjunction with other types of apparatus and appliances operating on gaseous fuel.

The filter may be described generally as comprising a hollow body having an inlet and an outlet, preferably arranged in axial alinement so that the filter may be installed in a straight run of pipe. The body contains a removable filter element comprising a skeleton structure covered with a suitable fabric material, preferably closely woven cloth, the covering being applied so as to close one end of the filter element, leaving the opposite end open. The body is shaped to provide an annular seat engaged by the open end of the filter element and disposed within the body so that the gas entering at the inlet flows through the filter element and seat to the outlet.

One of the principal objects of the invention is to support the filter element within the body in a manner such that the element may be positively retained against its seat and rendered easily removable for cleaning or replacement. In accordance with the invention, the filter element is held in position by a closure for the body opening through which the element is removable, the closure preferably being in the form of a plug being threaded into the body so that the plug may be screwed against the filter element to hold it tightly against its seat. In order to insure positive seating of the filter element, the skeleton is made longitudinally elastic or resilient so that as the closure is threaded against the element, the latter becomes longitudinally compressed, and remains so to maintain tight engagement with its seat.

In its preferred form, the filter element comprises a spiral spring skeleton to the surface and outer end of which cloth fabric is applied, an annular seat engaging ferrule being inserted within the open end of the element to hold the folded end of the fabric against the skeleton. At the opposite or closed end of the element, a handle stem, which may be an extension of the spring, is projected through the fabric into engagement with the closure, so that compressive force on the element is applied through the stem. The latter thus spaces the end of the element from the closure, and affords a convenient handle for inserting and removing the element from the body.

The above mentioned features of the invention, as well as additional aspects and details thereof, will be more fully understood from the following detailed description in which reference is made to the accompanying drawing. In the drawing, we have shown in sectional view, a typical and preferred form of filter embodying the invention.

The device comprises a hollow body 10 having an inlet 11 and an outlet 12 in axial alinement so that the body may be connected in a straight run of pipe. The inlet 11 may be connected to any suitable source of gas supply (not shown), for example any of the known systems for supplying vaporized butane. The outlet 12 may have suitable connection with a fuel consuming apparatus, such as an internal combustion engine operating on vaporized butane. A portion 10a of the body extends angularly with relation to the center line of the inlet and outlet, and has a threaded opening 13 closed by plug 14 which is removable to permit insertion and removal of the filter element generally indicated at 15.

The filter element comprises a longitudinally compressible and resilient frame or skeleton in the form of a spiral spring 16, having at its inner end an annular loop 17 adjacent an internal body flange 18 which forms a seat for the element. The longitudinal surface and outer end 15a of the skeleton 16 are covered by a fabric 19 consisting preferably of a fairly closely woven woolen cloth, which may be sewed along a seam, not shown, running longitudinally and across the closed end of the element. The fabric is folded inwardly at 20 about the inner end of the skeleton and is retained by an annular ferrule 21 which engages and holds the folded end of the fabric against the end loop 17 of the spring. The outer end 22 of the skeleton spring extends through the fabric 19 into engagement with the base of a tapered recess 23 formed in the plug 14, the extension 22 forming a handle stem by means of which the filter element may conveniently be inserted and removed from the body.

The filter element is held in position and the ferrule 21 is tightly pressed against the seat 18, by screwing plug 14 into the opening 13 to a point at which the skeleton spring 16 will become compressed. The element is brought into proper alinement with its seat by the stem 22 being centered within the tapered plug recess 23, and the element is held securely in place by virtue of the skeleton being maintained under compression. As will be apparent, the gas entering through the inlet 11 is filtered through the fabric 19, and flows through the seat 18 to the

outlet 12, the full area of the fabric being available as a filtering medium since the element contacts the body only at the seat 18 and the point of engagement between stem 22 and the plug. Liquid separated from the gas by the filter element drains into the bottom of the body and into the sump provided by the plug recess 23. By unscrewing plug 14, separated liquid may be drained out and the filter element removed for cleaning or replacement. The filter cloth may be replaced simply by removing the ferrule 21, slipping the cloth longitudinally of the skeleton and off the stem 22, and placing a fresh cloth on the skeleton.

The drawing is to be regarded merely as illustrative of the invention in one of its typical and preferred forms; and various changes and modifications may be made without departure from the scope of the invention as defined in the appended claims.

We claim:

1. In a filter of the character described, a hollow body having a fluid flow passage therethrough including a port, an annular seat formed in the body around the port, a filter element comprising a spiral spring skeleton, one end of which is formed to annular shape, a filter fabric enclosing the sides of the skeleton and its other end, the end edge of the fabric being pulled over and within the annular end formation of the skeleton, and a fabric holding and seat forming ferrule having a cylindric part entering the annular end formation and pinching the fabric edge against said end formation and having an annular seat flange at its outer end overlying the fabric where the latter is pulled over the end formation, said ferrule being of substantially the same diameter as the body port and said annular flange seating on the body seat surrounding said port, the body having an opening opposite the body seat and through which the filter element is insertible, and means closing said opening and adapted to exert endwise pressure upon the closed end of the filter element to hold its annular seating flange on the body seat.

2. In a filter of the character described, a hollow body having a fluid flow passage therethrough including a port, an annular seat formed in the body around the port, a filter element comprising a spiral spring skeleton, one end of which is formed to annular shape, a filter fabric enclosing the sides of the skeleton and its other end, the end edge of the fabric being pulled over and within the annular end formation of the skeleton, and a fabric holding and seat forming ferrule having a cylindric part entering the annular end formation and pinching the fabric edge against said end formation and having an annular seat flange at its outer end overlying the fabric where the latter is pulled over the end formation, said ferrule being of substantially the same diameter as the body port and said annular flange seating on the body seat surrounding said port, the body having an opening opposite the body seat and through which the filter element is insertible, the filter element being spaced from the body wall both at its sides and at its closed end, an end part of the spiral skeleton projecting longitudinally through the closed end of the filter fabric to form a supporting member for the filter element, and means closing the body opening, spaced from the closed end of the filter element, and engaging said supporting member to hold the annular seating flange on the body seat.

3. In a filter of the character described, a hollow body having a fluid flow passage therethrough including a port, an annular seat formed in the body around the port, a filter element comprising a cylindric spiral spring wire skeleton and a filter fabric enclosing the sides of the skeleton and one end only thereof, the open end of the filter element being annular and seating on the annular body seat, and the filter element when so positioned being spacedly clear of the body wall at its sides and at its closed end, the body having an opening in its wall opposite the closed end of the filter, an extension of the skeleton wire projecting centrally and longitudinally through the fabric at the closed end and having its terminus spaced outwardly a substantial distance from the filter fabric, and a closure for the body opening also spaced from the filter element and bearing against the terminus of the skeleton extension to hold the filter element on the body seat.

KARL W. WESTLUND.
ERNST J. DAHLEN.