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## COMPLETE SPECIFICATION

### Improvements in or relating to Gas Producers for Feeding Fuel to Internal Combustion Engines

I, JEAN GOHIN, French citizen, of 6, rue Thiers, Choisy-le Roi (Seine), France, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to a filtering device for filtering gas such as producer gas, and concerns more particularly the filtering of producer gas after its formation and prior to its use in an internal combustion engine.

According to the present invention a filtering device comprises a container in which is housed a filtering medium or cleansing material having a dusty and light consistency with which the gas to be filtered mingles and one or more permeable filtering pockets or elements which separate the filtering medium from the gas which passes through said elements, which are so constructed as to be elastically deformable, whereby the filtering medium is driven by the gas and deposited in a layer on the elements which, on deformation, cause the filtering medium to be shaken off, so that it does not accumulate on the elements but gravitates to the bottom of the container to maintain therein the supply of medium for the initial filtering of the gas.

Preferably the filtering elements are elastically deformable in response to the suction stroke of the engine.

One form of the invention is illustrated in the accompanying drawing, in which figure 1 is a vertical section of a container with filtering elements therein, figure 2 being a section to enlarged scale of one of said filtering elements, whilst figure 3 is a similar view of a modified form. Figures 4 and 5 show a further modified form of a filtering element in vertical and horizontal section respectively.

Referring to the drawing, the filtering device or purifier comprises a container 1 having a gas inlet 2 adjacent the base thereof and an outlet 3 adjacent the top thereof. In the container is provided a plate 4 from which a number of filtering elements such as pockets or tubes 5 depend. Mounted in an opening in a cone

shaped division plate 6 and above the gas inlet 2 is an inverted cone shaped cap 7 whose rim rests in an annular space formed in the lower edge of the plate 6. The rim of the cap 7 is provided with serrations to allow the gas to pass up through the cap while the annular space in which its rim rests acts as a seal to prevent the purifying material from falling through into the gas inlet chamber. The cap 7 is secured in position by a rod 8 which passes through its centre and may be used also to secure the top and bottom covers of the container. In the space between the cap 7 and division plate 6 a cleansing material 9, is housed. The cleansing material is of a dusty and light consistency and may for example be wood charcoal dust, so that it may be driven by the gases from the inlet 2 passing through the serrations of the cap 7 and deposited in a layer on the filtering elements 5, the layer by reason of the composition of the material remaining porous. Furthermore, the material is such that it will not cohere, so that it falls back again when the layer which has been formed on the filtering elements reaches a certain depth. The container is provided in the base with a removable member to facilitate cleansing or inspection of the device.

Referring more particularly to figure 2 there is shown one of the filtering elements 5 which is of permeable fabric or cloth and which is fixed in a metallic disc 10 mounted in the plate 4 of the container. On this disc 10 rests a perforated disc 11 which carries a rod 12 which passes throughout the length of the element 5 and has at its lower end a threaded portion on which screws a nut 13. The element is closed at this lower end by a member 14 to which the cloth is fixed and which has an annular extension 15 extending inwardly into the element, and in which the end of the rod 12 can slide. Sliding on this extension is a spring 16 which abuts at one end against the closure member 14 and at the other end against the nut 13. A member 17 which may be in the form of a spring or metallic cylinder slides on the rod 12

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and is held between the disc 10 and the closure member 14, the spring 17 being such that it cannot be deformed transversely.

5 Perforations 21 in the disc 11 are in communication via the outlet 3 of the container with the suction side of an internal combustion engine, so that the gases from the producer plant will be drawn through the filtering element 5 and on each suction stroke of the engine the elements will contract longitudinally to compress the spring 16 which, when the suction ceases will expand so that the elements 5 quickly return to their initial shape, causing the cleansing material with the dust or other impurities abstracted from the gas deposited on the fabric to fall away.

10 In the alternative form of filtering element shown in figure 3, the element is mounted on the plate 4 of the container and at its lower end is closed by a member 23 which is relatively heavy, and the shape of the element 5 is maintained by a spring member 24 such as described with regard to figure 2. The element is contracted lengthwise by the engine suction and regains its initial shape by reason of the weight 23 when suction ceases.

15 In the arrangements shown in figures 4 and 5, the elements 5 are replaced by one or more cloth or fabric pockets 25 of flat and elongated form, in which the shape is retained for example by a frame of spring wire 26 placed within the pocket and forming a loop 27 at its lower end. The walls of the pocket are spaced apart by a core 28 of metal or other suitable material such as cardboard which is plaited or corrugated. In this form the pocket has a large filtering surface without being cumbersome. As in the previous construction it is elastically deformable and responsive to the suction strokes of the engine, and this prevents the formation of too thick a layer of cleansing material.

20 In all the constructions of filtering elements described above, it will be appreciated that due to their formation and positioning, and with the assistance of alternate suction and cessation of suction from the engine, the filtering elements are elastically deformed and allowed to regain their original shape in rapid succession whilst the engine is running, and hence provide a very efficient filtering device, the filtered impurities falling from the filtering elements into the coned division plate from whence they may be removed as and when desired.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A filtering device for filtering gas such as producer gas comprising a container in which is housed a filtering medium or cleansing material having a dusty and light consistency with which the gas to be filtered mingles and one or more permeable filtering pockets or elements which separate the filtering medium from the gas which passes through said elements, which are so constructed as to be elastically deformable, whereby the filtering medium is driven by the gas and deposited in a layer on the elements which, on deformation, cause the filtering medium to be shaken off, so that it does not accumulate on the elements but gravitates to the bottom of the container to maintain therein the supply of medium for the initial filtering of the gas.

2. A filtering device as claimed in claim 1, in which the filtering elements are elastically deformable in response to the suction stroke of an engine to which the gas is to be supplied.

3. A filtering device as claimed in claim 1 or 2, in which each filtering element comprises a tube or pocket of permeable fabric secured at the top to a division plate in the container and provided at its lower end with a closure member, spring means being provided inside said tube or pocket whereby said element cannot be deformed transversely.

4. A filtering device as claimed in claim 1 or 2, in which the filtering elements are in the form of flat and elongated fabric pockets, the shape of which is retained by a frame of spring wire, the walls of the pocket being spaced apart by a core member which is itself made resilient by being given a plaited or corrugated form.

5. Filtering elements for filtering gas such as producer gas, constructed, and adapted to operate substantially as hereinbefore described and as shown in the accompanying drawing.

Dated the 31st day of May, 1938.

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[This Drawing is a reproduction of the Original on a reduced scale.]

