

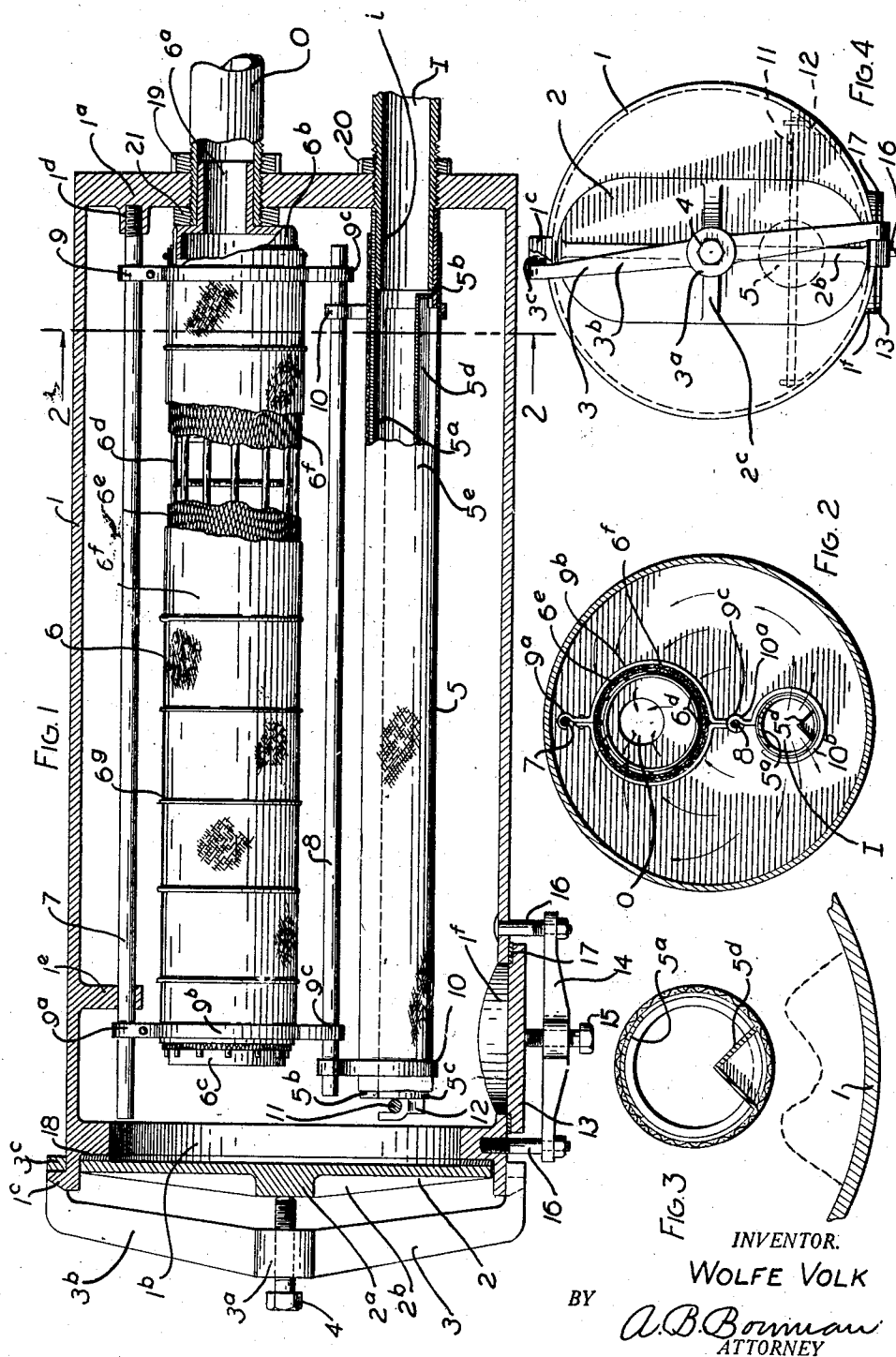
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W. VOLK

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FLUID CLEANER

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WOLFE VOLK, OF SAN DIEGO, CALIFORNIA, ASSIGNOR TO SAN DIEGO CONSOLIDATED GAS AND ELECTRIC COMPANY, OF SAN DIEGO, CALIFORNIA, A CORPORATION OF CALIFORNIA

FLUID CLEANER

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My invention relates to fluid cleaners and more particularly to a type of cleaner applicable to gases, and the objects of my invention are: First, to provide a cleaner for removing impurities or other deleterious matter from fluids, such as illuminating gas; second, to provide a fluid cleaner provided with deflecting means for separating the impurities from the fluid; third, to provide a filter which may be readily removed and renovated or replaced; fourth, to provide a filter adapted to direct the fluid away from the deposited impurities; fifth, to provide a device of this class in which the fluid is distributed relatively evenly over the filter surface; sixth, to provide a device of this class in which the velocity of the fluids is reduced and eddying of the fluid minimized; seventh, to provide a device of this class in which the inlet and outlet parts may be easily connected and disconnected from the inlet and outlet pipes; eighth, to provide a device of this class having readily removable openings for giving access to the filter parts and for removing the deposits of deleterious matter; ninth, to provide a device of this class in which the inlet and outlet pipes may be concealed or located in relatively inaccessible position without causing any inconvenience in renewing parts and cleaning out the chamber; tenth, to provide a device of this class having separate and distinct fluid diffusing elements and filter elements, and eleventh, to provide a device of this class which is relatively economical of manufacture, easy to maintain in service, rugged of construction, and which will not readily deteriorate or get out of order.

With these and other objects in view as will appear hereinafter, my invention consists of certain novel features of construction, combination and arrangement of parts and portions as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawings and to the characters of reference thereon which form a part of this application, in which:

Figure 1 is a longitudinal sectional view of my filter showing certain portions thereof

in elevation; Fig. 2 is a cross-sectional view in reduced scale taken along 2—2 of Fig. 1; Fig. 3 is an enlarged fragmentary view showing the manner in which deleterious matter is deposited, and Fig. 4 is an end view showing the cover clamping mechanism.

Similar characters of reference refer to similar parts and portions throughout the several views of the drawings.

The casing 1, cover 2, clamp 3, clamp bolt 4, diffusing cylinder 5, filter cylinder 6, suspension rods 7 and 8, suspension loops 9 and 10, lock bar 11, keepers 12, handhole cover 13, handhole clamp 14, bolt 15, studs 16, gaskets 17 and 18, and lock nuts 19 and 20, constitute the principal parts and portions of my fluid filter.

The casing 1 is in the form of a metallic cylinder having a solid end member 1a and a substantially oval shaped opening 1b at its other end. The major diameter of the opening 1b is substantially equal to the inner diameter of the cylinder. A correspondingly shaped cover 2 is adapted to fit over the opening 1b. The cover 2 is provided with a central boss portion 2a and reinforcing ribs 2b and 2c. The cover is held in position by means of a clamp member 3. The clamp member 3 comprises a central boss portion 3a and oppositely extending arms 3b which are bent at their outer ends substantially at right angles with the central portions and parallel with the axis of the boss 3a and at their extreme ends form laterally extending hook portions 3c. The hook portions 3c are adapted to engage the lugs 1c forming integral parts of the casing 1 and positioned substantially in the major axis of the opening 1b. A clamping bolt 4 is adapted to be screwed through the boss 3a into engagement with the boss 2a of the cover 2, thereby forcing the cover against the casing. A gasket 18 is positioned between the cover and the casing for obtaining a tight joint. The solid end 1a of the casing is provided with threaded openings to receive the inlet and outlet pipes I and O which are preferably screwed into the end 1a and secured in locked position by means of the nuts 19 and 20. The inlet pipe I extends within the casing 1 and forms a sleeve

i for supporting the one end of the diffusing cylinder 5.

The diffusing cylinder 5 includes a long, laterally arcuate strip or shield 5*a* having at its one end a cylindrical portion 5*b* adapted to be received by the sleeve *i*. The end opposite the cylindrical portion 5*b* is secured to a circular cap 5*c*. Extending lengthwise between the cap 5*c* and the cylindrical portion 5*b* is an angular baffle 5*d*. The baffle 5*d* is supported in parallel spaced relation with the shield with the side portions extending downwardly. A tube 5*e* formed of wire gauze is positioned over the shield 5*a* and the baffle member 5*d* and extends between the cap 5*c* and the cylindrical portion 5*b*.

The filter cylinder 6 is connected with the outlet O by means of a sleeve 6*a* which is adapted to slip into the inner end of the outlet pipe O. The sleeve 6*a* forms an extension of an end cap 6*b* having an annular rim, eccentric relative to the sleeve 6*a*. A solid, circular cap 6*c* forms the opposite end of the filtering cylinder 6. A plurality of axially extending reinforcing wires 6*d* extend between the end caps 6*b* and 6*c* and are suitably secured to the peripheries thereof forming an elongated cage therewith for supporting a cylinder 6*e* of metal gauze. Around this is wrapped a number of layers of fabric 6*f*, forming the filtering medium of the device.

The fabric 6*f* is held in position by means of a plurality of hoops 6*g* which are preferably in the form of resilient, split rings. The filter cylinder 6 is suspended by means of the suspension loops 9 from a suspension rod 7. The latter is preferably screwed into a boss 1*d* extending inwardly from the end member 1*a* near the periphery thereof, and is supported near its other end by means of the depending ear 1*e*, which is provided with a suitable aperture substantially in alignment with the axis of the boss 1*d*. The suspension loops 9 are made preferably of metallic strips and form at their upper end a hook portion 9*a* adapted to engage the suspension rod 7, a central, cylindrical portion 9*b* of a diameter sufficient to accommodate the filtering cylinder 6 and a downwardly depending eye portion 9*c*. The suspension loops 9 are positioned close to the ends of the filtering cylinder 6 and support the latter somewhat above the center of the casing 1 in alignment with the outlet pipe O. A second suspension rod 8 is supported in the eye portions 9*c* of the suspension loops 9. A second pair of suspension loops 10, which form an upper hook portion 10*a* have a substantially circular portion 10*b* adapted to encircle the diffusing cylinder 5 and are suspended by means of the hook portion 10*a* from the suspension rod 8 and support the diffusing cylinder 5 in correct alignment with the inlet pipe I below the filter cylinder 6. Axial displacement of the diffusing cylinder 5 is prevented by means

of the lock bar 11 which extends across the cap member 5*c* and is supported at its end in the keepers 12, secured to the inner side of the casing 1 in line with the horizontal axis of the cap 5*c*. The filter cylinder 6 is forced by the fluid pressure within the casing 1 in a direction against the inner surface of the end member 1*a* and in order to prevent leakage of the fluid a suitable washer 21 is positioned between the cap 6*b* and the inner surface of the end member 1*a* around the inner end portion of the outlet pipe O.

A handhole 1*f* is provided in the lower side of the casing 1 adjacent the opening 1*b* therein. The handhole 1*f* is sealed by means of a cover 13 which is held in position by means of the handhold clamp bolt 15. The latter is screwably supported in a clamp member 14 extending across the cover 13 and supported on the studs 16, as clearly shown in Fig. 1 of the drawings. A gasket 17 is provided between the cover 13 and the margin of the opening 1*f* for preventing leakage of fluid through the joints.

The operation of my fluid filter is as follows: The fluid, such as illuminating gas, enters the diffusing cylinder 5 through the inlet I and passes out through the side thereof at reduced velocity, following the direction indicated by the arrows in Fig. 2. Owing to the disposition of the arcuate member 5*a* and the angular baffle member 5*d*, the fluid is directed toward the lower, central side portions of the casing 1, and is prevented from flowing against the bottom of the casing by means of the baffle 5*d*, and from taking an upward direction by means of the shield 5*a*.

The function of the wire gauze 5*e* is to more or less evenly diffuse the fluid entering the cylinder over its entire length so that the fluid in passing between the diffusing cylinder and the filtering cylinder flows more or less in a vertical direction, thereby avoiding axial movement within the casing 1, with the result that whirls and eddies are reduced as far as possible.

Owing to the greatly reduced velocity of the fluid passing from the diffusing cylinder the greater part of the impurities brought into the diffusing cylinder will be released, forming a heap below the diffusing chamber, as indicated in dotted lines in Fig. 3. Owing to the disposition of the angular baffle 5*d*, the pile is more or less protected from the flow of the fluid and will not be drawn up thereby.

The fabric 6*f* on the filter cylinder prevents the passage of any of the finer and lighter particles of deleterious matter still contained in the fluid from entering the cylinder 6 and passing out through the outlet pipe O.

Where it is desired to remove the precipitated deleterious matter from the cylinder, the hand hole 1*f* is opened by removing the cover 13. This is readily accomplished by

loosening the clamping bolt 15 and removing the clamp 14 from the stud 16. One deposit can then be easily scraped out.

As occasion demands the filter cylinder 6 is removed from the casing 1 by withdrawing it from the suspension loop 9. This, of course, can be readily accomplished as the sleeve portion 6a fits slidably within the inner end of the outlet O.

The diffusing cylinder 5 may also be readily removed by raising the locking bar 11 and withdrawing axially from the sleeve i, and the suspension loops 10.

It is obvious that the cover 2 of the casing is removed by loosening the clamping bolt 4 and revolving the clamp member 3 anticlockwise until the hook portions 3c thereof clear the lugs 1c. The clamp and cover can then be removed. As it is unnecessary to have access to the inner end of the cylinder for removing the parts contained therein, accessibility of that part is not essential and the inlet and outlet pipes may be entirely concealed or buried.

Though I have shown and described a particular construction, combination and arrangement of parts and portions, I do not wish to be limited to this particular construction, combination and arrangement, but desire to include in the scope of my invention the construction, combination and arrangement substantially as set forth in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a device of the class described, an outer substantially horizontal enclosing casing, having an opening at its one end, a readily removable cover for said opening, inlet and outlet pipes connected to the other end of said casing, a filter cylinder positioned within the casing and removably connected with said outlet pipe, a diffusing cylinder positioned within the casing and removably connected with said inlet pipe, said diffusing cylinder and said filter cylinder so arranged that the said filter cylinder receives fluid directly from said diffusing cylinder throughout its entire length, and means for locking said diffusing cylinder in position.

2. In a device of the class described, a relatively long, cylindrical substantially horizontal outer casing having an opening at its one end, an inlet pipe connected with said casing at its other end and extending within said casing forming a sleeve, a relatively long diffusing cylinder positioned within said casing and slidably supported at its one end on said sleeve, means for suspending the end of said diffusing cylinder within said casing, locking means for preventing axial movement of said diffusing cylinder, an outlet pipe connected with the one end of said outer casing, a filter cylinder suspended within the

casing and supported at its one end within said outlet pipe, said diffusing cylinder and filter cylinder adapted to be readily withdrawn from said casing.

3. In a device of the class described, a substantially horizontal cylindrical outer casing having an opening at its one end, a readily removable cover for said opening, an inlet and outlet pipe connected to the other end of said casing, a relatively long diffusing cylinder consisting of a tube of metal gauze adapted to be connected at its one end to said inlet pipe, means within said diffusing cylinder for causing the fluid to flow through the side portion only thereof, and directed away from the portion of the casing below the diffusing cylinder, said diffusing cylinder adapted to cause a relatively even distribution of the fluid along the casing and to prevent whirling and eddying of the fluid therein.

4. In a device of the class described, a substantially horizontal cylindrical outer casing having an opening at its one end, a readily removable cover for said opening, an inlet and outlet pipe connected to the other end of said casing, a diffusing cylinder, said inlet pipe extending within the casing and forming a sleeve portion adapted to receive the one end of the diffusing cylinder, said diffusing cylinder including a tube of metal gauze, baffle means within said tube comprising a lengthwise extending arcuate strip forming an upper shield and an angular baffle resting with its edges on the lower portion of said tube, said shield and baffle causing the fluid to pass through the side portions only of said tube, a filter cylinder positioned within said casing above said diffusing cylinder and connected with said outlet pipe, one end of said filter cylinder having a sleeve portion adapted to fit within the outlet pipe, and suspension loops for supporting the free ends of said diffusing cylinder and said filter cylinder within the casing.

5. In an illuminating gas cleaner, the combination with inlet and outlet pipes, of an elongated cylindrical outer casing, having a closed inner end portion, means for permanently connecting said pipes with openings in said end portion, filtering and diffusing cylinders communicating with said openings, and a cover on the normally accessible outer end of said casing, and means normally accessible for supporting said cylinders in position within said casing, said means permitting easy removal of said cylinders through said outer end and the removal of deposits from within said casing.

In testimony whereof, I have hereunto set my hand at San Diego, California this 9th day of January 1929.

WOLFE VOLK.