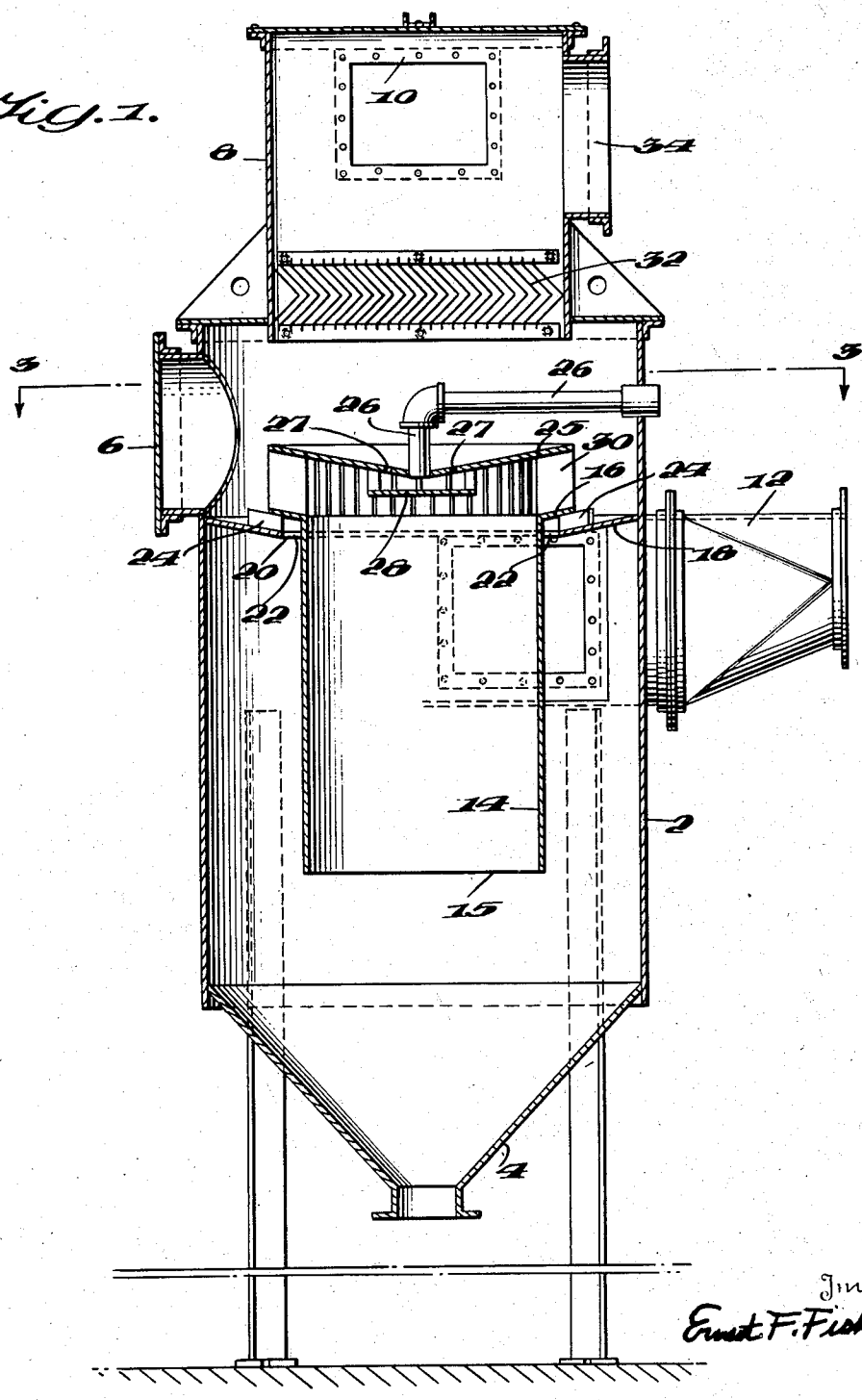
Aug. 1, 1944. E. F. FISHER 2,354,676

GAS CLEANER

Filed May 26, 1942 2 Sheets-Sheet 1

Fig. 1.



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Filed May 26, 1942 2 Sheets-Sheet 2

Fig. 2.

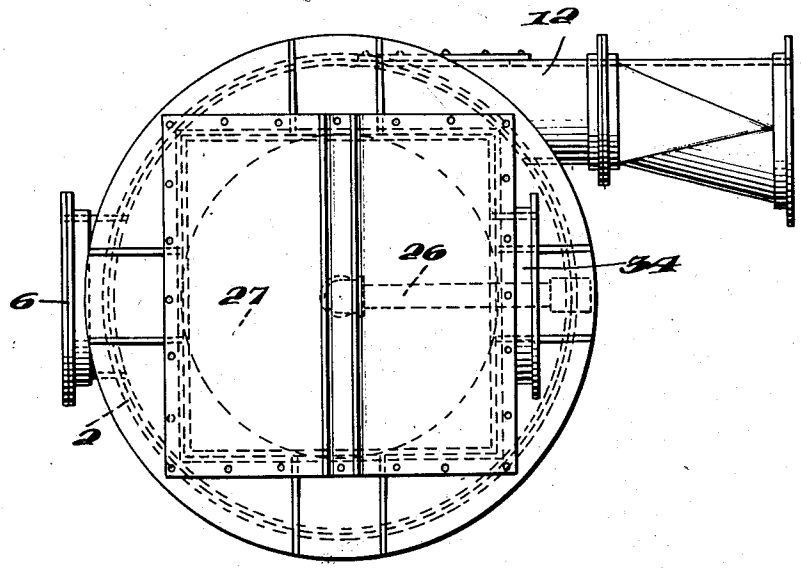
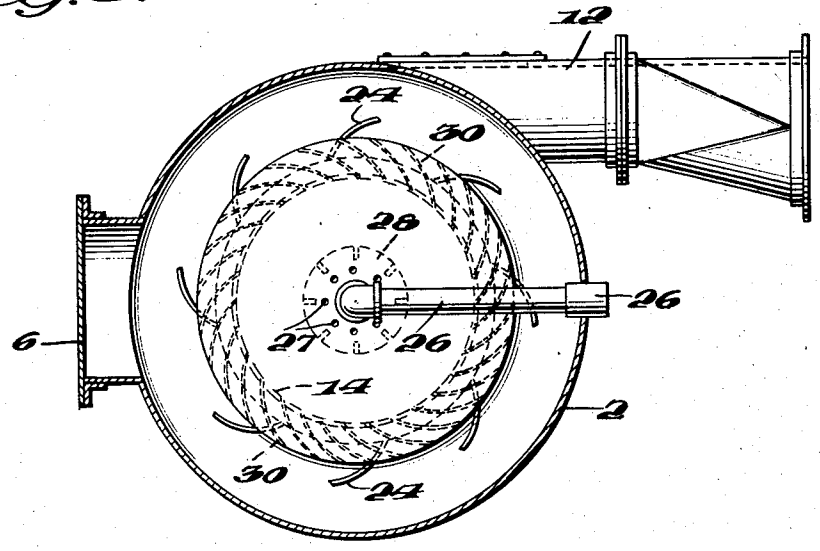


Fig. 3.



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UNITED STATES PATENT OFFICE

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GAS CLEANER

Ernest F. Fisher, Boston, Mass.

Application May 26, 1942, Serial No. 444,583

4 Claims. (Cl. 183—22)

This invention is an apparatus for cleaning dust-laden air or other gas, and is an improvement over the cleaners shown in my Patents 2,259,033 and 2,259,034, dated October 14, 1941, and over the apparatus shown in my applications Serial No. 367,312, filed November 27, 1940, and Serial No. 421,323, filed December 2, 1941.

For convenience, the gas being cleaned is usually air and the liquid used is usually water, and the invention will be so described, although it is to be understood that the invention is not limited to the cleaning of air nor limited to the use of water as the cleaning liquid.

The apparatus comprises a large vertical open-ended tube at about the same level as the usual tangential air inlet located near the bottom of the apparatus. An important object of the invention is to provide means whereby water is delivered to the outside wall of this vertical tube for keeping this wall thoroughly wet and for washing down any dust that may have accumulated thereon.

Other advantages of structure and operation will be described in connection with the accompanying drawings, in which

Fig. 1 is a view in vertical cross section;

Fig. 2 is a top plan view; and

Fig. 3 is a section on the line 3—3 of Fig. 1.

Referring now to these drawings, the cleaner comprises a vertical cylindrical casing 2 having a sludge collecting bottom 4, one or more manholes 6 and a top section 8 having an inspection door 10.

The casing 2 is provided with a tangential air inlet 12. At approximately the level of the tangential air inlet, there is positioned in the casing a large open-ended vertically placed tube 14, having a lower edge 15 and provided with an out-turned, inwardly inclined flange 16 at its upper end. Just below the flange 16 is a baffle ring 18, also inclined downwardly and inwardly, the outer edge of which is in contact with and held by the inner wall of the casing, while its inner edge 20 defines an annular water inlet 22 between such edge and the outer wall of the tube 14. A series of angularly placed vanes 24 are secured to the inner edge of the baffle 18 and extend upwardly against flange 16 and are thereby positioned between the baffle and said flange 16.

Positioned centrally and a little distance above the upper end of the tube 14 is a disc baffle 25, which slopes inwardly to a central hole through which passes a water inlet pipe 26. Drain holes 27 may be provided in baffle 25. Positioned a short distance below the inlet end of the pipe 26 is a deflector plate 28 for deflecting water radially, laterally and outwardly through and against swirling vanes 30, angularly positioned between the out-turned flange 16 of tube 14 and the outer portion of the baffle 25.

The vanes 30 are placed at such an angle as to continue the swirling movement of the water and gas passing upwardly through the tube 14, while the vanes 24 are preferably angled the other way, as shown in Fig. 3.

In operation, a heavy stream of water from the pipe 26 is spread radially and laterally by deflector 28 in all directions through and against the vanes 30, against which the dust impinges, keeping them washed clean, the dust, air and water continuing its outward circular swirling movement through the vanes. A substantial amount of water, however, will drain down the sides of vanes 30 onto flange 16 and be directed onto the inner wall of cylinder 14, keeping such wall thoroughly wet, and washed clean of any dust that might accumulate thereon. The purified air passes upwardly through the mist or droplet trap 32 and thence out of the outlet pipe 34. Most of the water, after it has passed through the swirling vanes 30, is collected by the baffle ring 18 on which a head of water builds up, thus preventing any appreciable amount of air passing upwardly through space 22. This water flows between angular vanes 24 and is delivered to the annular water inlet 22 with a downward circular motion, thereby thoroughly wetting the outside of the tube 14 and keeping it washed free of accumulated dust. Some of the heavier dust particles as they first enter the tangential air inlet 12 will be thrown out by centrifugal force and will settle in bottom cone 4, while others in passing upwardly in tube 14 will be impinged on the interior wetted wall because of the high angular velocity of swirl in this tube, and will be washed down into cone 4.

While I have illustrated my invention in detail, it should be understood that the invention is not limited to these exact details, but may be carried out in other ways.

I claim as my invention:

1. Cleaning apparatus for air or gas, comprising in combination a casing, an open-ended tube positioned vertically therein, an air inlet in the casing adjacent said tube, a ring baffle surrounding and spaced from the upper end of said tube, thereby defining an annular liquid inlet adjacent the outside wall of said open ended tube, a centrally positioned solid disc baffle above and spaced

from the upper end of said tube, swirling vanes positioned between the outer edge of said disc baffle and the upper end of said tube, a liquid spreader plate positioned centrally below the disc baffle, a pipe for delivering water under pressure to said spreader plate whereby the water is confined between the disc baffle and spreader plate and is projected laterally over the entire surfaces of said swirling vanes, said ring baffle serving to collect water and sludge washed from the inner wall of the casing and to direct such water and sludge into and through said annular liquid inlet to the outside wall of the open-ended tube, and an outlet for cleaned air in the upper part of the casing.

2. Cleaning apparatus for air or gas, comprising in combination a casing, an open-ended tube positioned vertically therein, an air inlet adjacent said tube, a ring baffle surrounding and spaced from the upper end of said tube, thereby defining an annular liquid inlet adjacent the outside wall of said open-ended tube, liquid collecting vanes on the upper, inner edge of the ring baffle, for directing liquid into said annular liquid inlet, a centrally positioned solid disc baffle above and spaced from the upper end of said tube, swirling vanes positioned between the outer edge of said disc baffle and the upper end of said tube, a liquid spreader plate positioned centrally below the disc baffle, a pipe passing through the disc baffle for delivering water under pressure to said spreader plate whereby the water is confined between the disc baffle and spreader plate and is projected laterally over the entire surfaces of said swirling vanes, said ring baffle serving to collect water and sludge washed from the inner wall of the casing and to direct such water and sludge into and through said liquid collecting vanes and thence into said annular liquid inlet to the outside wall of the open-ended tube.

3. Cleaning apparatus for air or gas, comprising in combination a casing, an open-ended tube positioned vertically therein, a tangential air inlet adjacent said open-ended tube the upper end of said tube being provided with an outwardly extending flange, a solid disc baffle positioned centrally above the upper end of said tube, with its outer edge directly above said flange, swirling vanes positioned between the coextensive portions of said flange and disc baffle, a liquid spreader plate positioned centrally below the disc baffle, a pipe passing through the disc baffle for delivering water under pressure to said spreader plate whereby the water is confined between the disc baffle and spreader plate and is projected laterally over the entire surfaces of the swirling vanes, a ring baffle surrounding the upper end of said tube, having its outer edge contacting the inner wall of the casing and having its inner edge spaced from the upper end of the open-ended tube to define an annular liquid inlet below said outwardly extending flange and adjacent the outside wall of said open-ended tube, said ring baffle serving to collect water and sludge washed from the inner wall of the casing, and to direct it to and into said annular liquid inlet, and an outlet for cleaned air in the upper part of the casing.

4. Cleaning apparatus for air or gas, comprising in combination a casing, an open-ended tube positioned vertically therein, a tangential air inlet adjacent said open-ended tube, the upper end of said tube being provided with an outwardly extending flange, a solid disc baffle positioned centrally above the upper end of said tube, with its outer edge directly above said flange, swirling vanes positioned between the coextensive portions of said flange and disc baffle, a liquid spreader plate positioned centrally below the disc baffle, a pipe passing through the disc baffle for delivering water under pressure to said spreader plate whereby the water is confined between the disc baffle and spreader plate and is projected laterally over the entire surfaces of the swirling vanes, a ring baffle surrounding the upper end of said tube, having its outer edge contacting the wall of the casing and having its inner edge below said outwardly extending flange and spaced from the upper end of the open-ended tube to define an annular liquid inlet adjacent the outside wall of said open-ended tube, liquid collecting vanes on the upper, inner edge of the ring baffle for directing water and sludge washed from the casing wall to and into said annular liquid inlet, and an outlet for cleaned air in the upper part of the casing.

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