

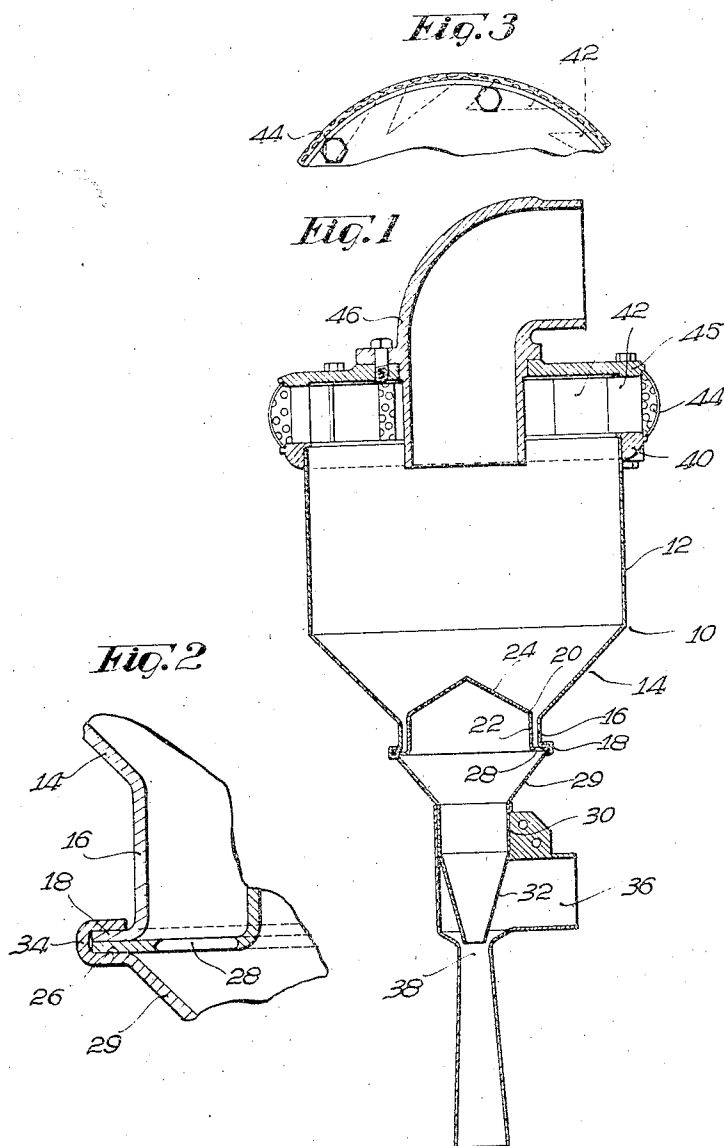
Jan. 19, 1926.

1,570,040

M. E. CHANDLER

AIR CLEANER

Filed Sept. 9, 1921



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UNITED STATES PATENT OFFICE.

MILTON E. CHANDLER, OF CHICAGO, ILLINOIS.

AIR CLEANER.

Application filed September 9, 1921. Serial No. 499,467.

To all whom it may concern:

Be it known that I, MILTON E. CHANDLER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Air Cleaners, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to cleaning devices, and more specifically to an improved device for cleaning gases by the separation therefrom of dust and other material in suspension therein.

One object of my invention is to improve the functioning of devices of this sort.

Another object is to simplify and cheapen the construction thereof.

Further objects and advantages of the invention will become apparent as the description proceeds.

In the accompanying drawings:

Figure 1 is a sectional view of a device constructed according to the principles of my invention, and

Figure 2 is an enlarged detailed section.

Figure 3 is a fragmentary plan view showing the arrangement of the inlet guides.

In the embodiment of my invention selected for illustration, the shell 10 comprises a cylindrical part 12 and a conical portion 14 terminating in a short cylindrical lip 16 having an outwardly turned flange 18. The diaphragm or baffle 20 comprises a cylindrical portion 22 cooperating with part 16 to form a narrow annular space, and extending somewhat above the upper end of part 16, crowned by a conical cap 24, the walls of which, in this instance, make an angle of 60° with the axis of the cone. An outwardly turned lip 26 projects from the lower edge of cylindrical portion 22, which lip is perforated as at 28.

A lower deposit and discharge chamber below the baffle 20 is defined by a lower shell comprising a conical portion 29, a cylindrical portion 30 and a final cone 32. The upper edge of cone 29 is beaded around lips 18 and 26 as at 34 to fasten all three pieces firmly together.

A tubular ejector formed of sheet metal stampings is clamped to the cylindrical portion 30 of the lower shell. This ejector

comprises a lateral inlet 36 the end of which surrounds cone 32, and a downwardly directed venturi 38, the throat of which is substantially in the same plane as the open lower end of cone 32.

The cylindrical portion 12 of shell 10 is surmounted by a ring 40 supporting a plurality of baffle or inlet guides 42 housed within a peripheral screen 44. Guides 42 (see Figure 3) are shaped to define a plurality of tangentially directed passages entering the upper chamber defined by said guides and by shell 10. The top of the chamber is defined by cover plate 45, supporting a discharge tube 46, projecting below the plane of inlet guides 42, and in this instance terminating in laterally directed elbow.

The operation of the device is as follows:

Air or gas entering between guides 42 forms a rapidly whirling body within shell 10, whereby suspended matter of greater specific gravity than the body of gas is thrown to the outside against walls 12, and, as the whirling mass descends, against the inclined wall 14. The gas is now deflected by walls 14 and cone 24 to form a rising column in the center of the device which makes its exit through tube 46. Solid material, or any material of greater specific gravity than the medium passing through the device, is thus deposited and finds its way into the annular space between the cylindrical walls 16 and 22, falling through orifices 28 into the lower chamber.

Ejector action in venturi 38, maintains sufficient vacuum at the opening of cone 32 to insure a constant flow of a relatively small quantity of gas downwardly through orifices 28 and the lower chamber. The material deposited is thus positively drawn or thrown downward through the lower chamber and finally ejected.

When the device is used in connection with an internal combustion engine, part or all of the exhaust gases are made to pass through the ejector, and the inlet of the engine is connected to tube 46.

Without further elaboration, the foregoing will so fully explain the gist of my invention, that others may, by applying current knowledge, readily adapt the same for use under various conditions of service, without eliminating certain features which may properly be said to constitute the es-

essential items of novelty involved, which items are intended to be defined and secured to me by the following claims.

I claim:

1. In a cleaner, a large shell, a small shell, one end of said large shell and one end of said small shell being of the same diameter and juxtaposed, and a baffle dividing the space inside said shells into two chambers in open communication with each other, two of said members having annular lips and the third having an annular bead gripping said lips to unite all three into a rigid structure.
2. In a cleaner, two shells having abutting ends, a baffle separating the space inside said shells into two chambers in open communication, a bead on one shell, and lips on the other shell and on said baffle gripped by said bead to hold the parts together.
3. In combination, three annular elements superposed, and a lip on one of the elements turned over the edges of both the others to hold all three of them securely together.
4. In a device of the kind described, a head member having an annular row of tangential inlet openings, the head composed of two opposed members clamped together, and a perforate guard member arranged outside of said inlet openings and clamped in position between the edges of the two head members.
5. In a device of the kind described, a head member composed of a ring member and an opposed cover member, the two members adapted to be secured in spaced relation to provide inlet passages between them, the outer edges of said members formed to provide a circumferential shallow channel, and a ring-like perforate guard ring held in said channel.
6. In a device of the kind described, a sheet metal casing having a central opening at its lower end, the lower end of the casing formed into an annular outwardly extending flange, a baffle within the outlet of the casing having a similar flange, a closure for the lower end of the casing having a restricted outlet at its lower end and having its upper edge formed around said two flanges for retaining the three parts in their relative position.
7. In a device of the kind described, a sheet metal truncated cone, a sheet metal conical member for continuing the cone, a sheet metal partition arranged at the juncture of the two parts of the cone, the two parts having interlocked flanged edges at their adjacent edges engaging and clamping the outer edge of the partition for securing it in place.
8. In a cleaner, a shell having an axial outlet and a substantially continuous peripheral radial inlet at the same end, guides in said inlet defining short open air passages for directing incoming air tangentially, and a narrow annular screen outside said guides to steady the flow.
9. A cleaner having, in combination, two chambers in open communication, one chamber terminating in an open frustum of a cone with its small end outermost, and a sheet metal casing gripping the walls of said chamber adjacent the base of the cone, said casing defining a Venturi passage with its throat adjacent to the end of said chamber, and a lateral inlet enveloping the end portion thereof.
10. In a device of the kind described, a sheet metal casing having a reduced lower end provided with a cylindrical portion, a sheet metal connection for the lower end thereof adapted to be clamped to said cylindrical portion and to provide a Venturi tube surrounding the discharge opening of the casing, said connection formed with a side opening between its ends for receiving a pressure supply pipe, and said connection adapted to be clamped to said pipe.
11. A cleaner having, in combination, two chambers in open communication, one chamber terminating in an open frustum of a cone with its small end outermost, and a sheet metal casing fastened to said chamber adjacent the base of the cone, said casing defining a Venturi passage with its throat adjacent the end of said chamber, and a lateral inlet enveloping the end portion of said cone.
12. A cleaner having, in combination, two chambers in open communication, one chamber terminating in an open frustum of a cone with its small end outermost, and a sheet metal casing fastened to said chamber, said casing defining a Venturi passage with its throat adjacent to the end of said chamber, and an inlet enveloping the end portion of said cone.
13. A cleaner having, in combination, two chambers in open communication, one chamber terminating in an open frustum of a cone with its small end outermost, and a sheet metal casing fastened to said chamber, said casing defining a Venturi passage arranged to draw material from the end of said chamber.
14. A cleaner having, in combination, two chambers in open communication, one chamber terminating in an open frustum of a cone with its small end outermost, and a sheet metal casing defining a Venturi passage arranged to draw material from the end of said chamber.

In witness whereof, I hereunto subscribe my name this 7 day of September, 1921.

MILTON E. CHANDLER.