A. C. BENNETT.

AIR CLEANER.

APPLICATION FILED AUG. 16, 1917.

1,323,816.

Patented Dec. 2, 1919.

2 SHEETS—SHEET 1.

Fig. 1

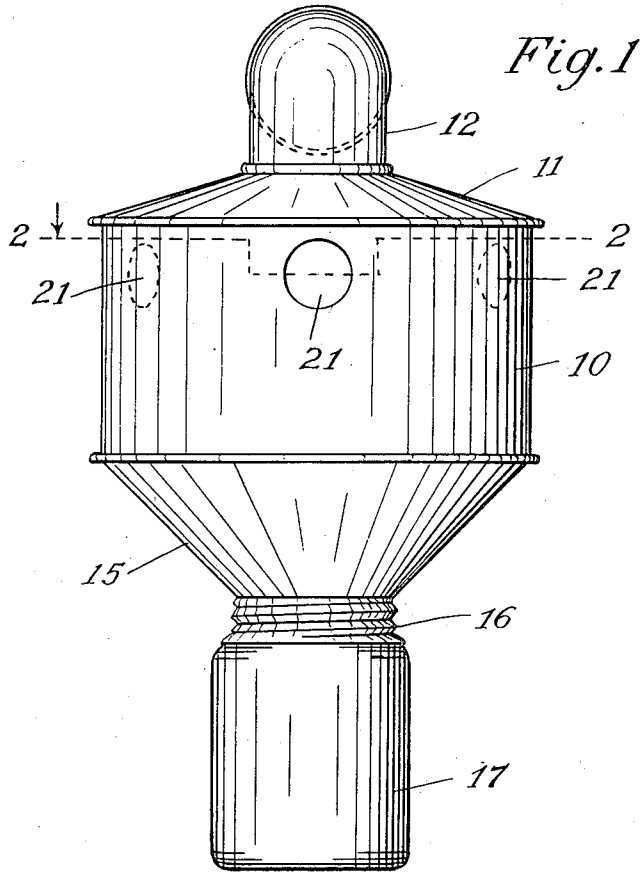
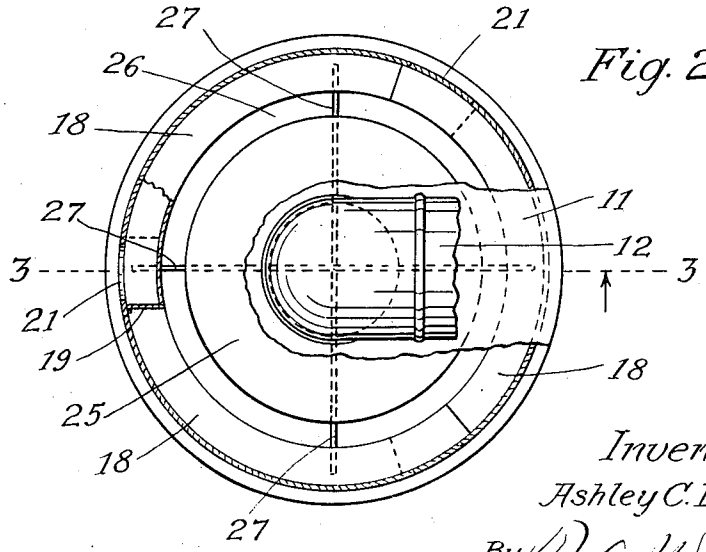


Fig. 2



Inventor:
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By A. A. Whiteley
his Attorney.

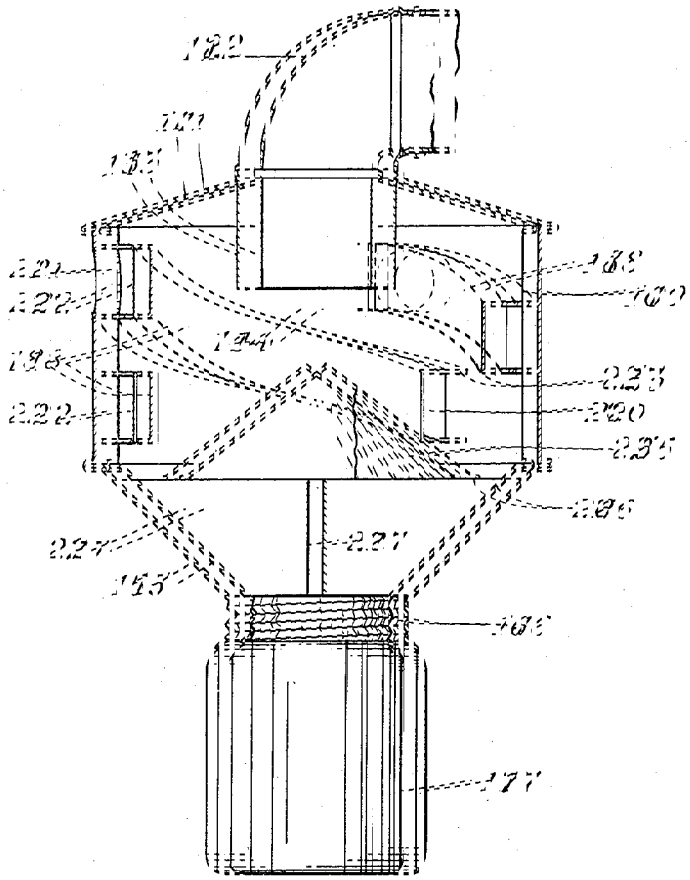
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UNITED STATES PATENT OFFICE.

ASHLEY C. BENNETT, OF MINNEAPOLIS, MINNESOTA.

AIR-CLEANER.

1,323,816. Specification of Letters Patent. Patented Dec. 2, 1919.

Application filed August 16, 1917. Serial No. 186,540.

To all whom it may concern:

Be it known that I, ASHLEY C. BENNETT, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Air-Cleaners, of which the following is a specification.

My invention relates to air cleaners and has for its object to provide an improved air cleaning device which shall be adaptable for use particularly in connection with the cleaning of air for carbureters and for suction cleaning devices, etc. It is the object of my invention to provide such a device having an outer casing for admitting the air to be cleaned to the casing, so that the same will be caused to travel in a cyclone in the casing, in combination with means in the casing for producing suitable dead-air collecting space at and below the point of producing the whirl and providing means for acting upon the return currents so as to cause any dust held therein to be stopped in its tendency to move with the air and ultimately to move into the dead-air collecting space.

The full objects and advantages of my invention will appear in connection with the detailed description thereof and are particularly pointed out in the claim.

In the drawings, illustrating the application of my invention in one form,—

Figure 1 is an elevation view of an air cleaner of the type described. Fig. 2 is a sectional plan view on line 2—2 of Fig. 1. Fig. 3 is a sectional elevation taken on line 3—3 of Fig. 2.

As illustrated, I provide a cylindrical casing 10 having a slightly conical top 11 provided with a central aperture through which extends a pipe 12, a portion of said pipe as indicated at 13 entering the chamber 14 formed by the casing 10 and extending into said chamber a considerable distance below the top plane of the cylindrical portion 10. The casing 10 has connected to the lower edge thereof a conical extension 15 which is provided with a threaded mouth 16 into which is screwed a collecting receptacle 17 which may conveniently be a glass jar, as shown.

Secured within the casing 10 are a multiplicity of spiral trough-like members 18 which have their upper ends closed, as indicated at 19 in Fig. 2, and their lower ends open as indicated at 20 in Fig. 3. As shown, there are three of the spiral members, and an aperture 21 opens through casing 10 into each of said trough members 18 just in front of the closed end wall 19. Air entering chamber 14 in casing 10 must, therefore, pass through the apertures 21 and the spiral passageways 22 formed by troughs 18, and finds its exit from said passageways into the chamber in a plane near the bottom of the cylindrical casing 10 and its outlet through pipe extension 13, the lower end of which is in substantially the horizontal plane of the inlet openings 21. The trough members 18 are of such length that the upper and lower ends of contiguous members overlie one another, as clearly indicated in Fig. 3, so that the several members form in effect a continuous baffle or ledge around the interior of casing 10 with breaks or openings in said baffle as indicated at 23 in Fig. 3.

Below the cylinder 10 and connected with the conical extension 15 is a reverse cone 25 the apex of which extends through or above the plane of formation of the cyclone from the delivery ends 20 of the passageways 22, and the lower edge of which is slightly below the junction of the cylindrical casing 10 and the conical portion 15 and is spaced from the wall of conical portion 15 a distance such as to leave an annular passageway 26. Vertical partitions 27 divide the space below the cone 25 into a multiplicity of vertical passageways, thus destroying any tendency of the air to whirl in the dead-air space formed below cone 25 and in receptacle 17.

The operation of the above parts is as follows: Pipe 12 is connected to the suction pipe of an engine or of an air pump or suction device such as a suction cleaner and whereby currents of air are induced to enter the chamber 14 within casing 10 through the openings 21 and the spiral passageways 22, discharging in a slightly downward whirling direction at the lower portion of casing 10 and around conical member 25. From here the air ascends in a whirl, ultimately passing into extension 13 of pipe 12 and to and through the suction device. The whirl thus produced is consequently in effect pyramidal or conical in form, being wide at the bottom and drawn to a comparatively small dimension at the top where it enters the pipe extension 13. The par-

ticles of dirt in this whirl will, by centrifugal force, be thrown to the outer part thereof. Most of these particles will immediately gravitate through the annular passageway 26 and the vertical passageways formed by partitions 27 into the receptacle 17. Some particles may collect on the cone 25 but will slide by gravity down said cone and pass through the annular passageways 26. Some of the finer dust in the cyclone may not immediately pass through passageways 26 but will tend to move up with the cyclone. These particles will, however, have passed to the outside of the whirl, and in their upward movement will encounter the lower walls of the troughs 18 which act as a baffle or stop. Furthermore, the quick drawing in of the cyclone in order to reach the extension 13 will bring such particles of dirt out of the cyclone when they come under the troughs 18, with the result that they will then gravitate along the wall 10, ultimately passing through openings 23 between the troughs or over the upper ends of the troughs where the particles of dirt get upon the top of the troughs, and finally reaching the annular openings 26 and the dead-air collecting spaces leading to receptacle 17. The air passing through extension 13 at a point below the top of the trough baffle-members will be in a very rapid whirl, such that the finest of the dust which might otherwise remain in the air is thrown out of the air below the edges of extension 13 and moves along the tops of baffles 18 until it passes over the ends thereof in the comparative dead-air space in the upper part of the chamber 14 above the lower plane of pipe extension 13, from which such dust will gravitate downwardly and finally find its way through annular passages 26 to the collecting spaces and receptacle 17.

I claim:

A dust collector comprising a cylindrical casing, trough-like members spirally arranged on the inside of said casing and forming spiral passageways for introducing air into the casing and discharging it in a cyclone at the bottom part of said casing, the lower walls of said passageways forming baffles about the sides of the casing, a central conical baffle extending upwardly from the bottom portion of the casing through the lower planes of said members, and a discharge pipe extending centrally into the casing to a point substantially below the top plane thereof and directly above the tip of the conical member.

In testimony whereof I affix my signature.

ASHLEY C. BENNETT.