

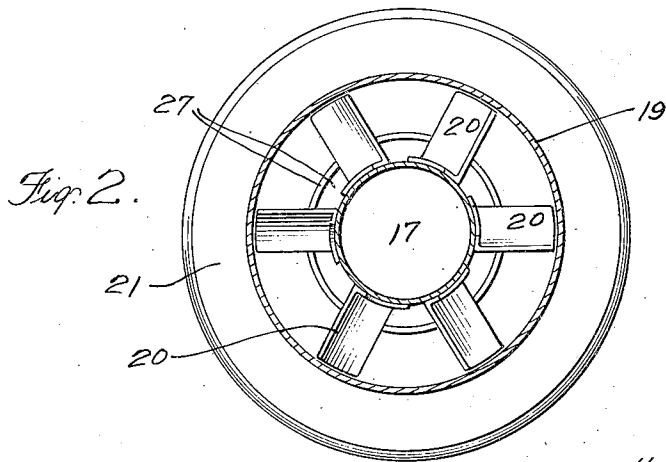
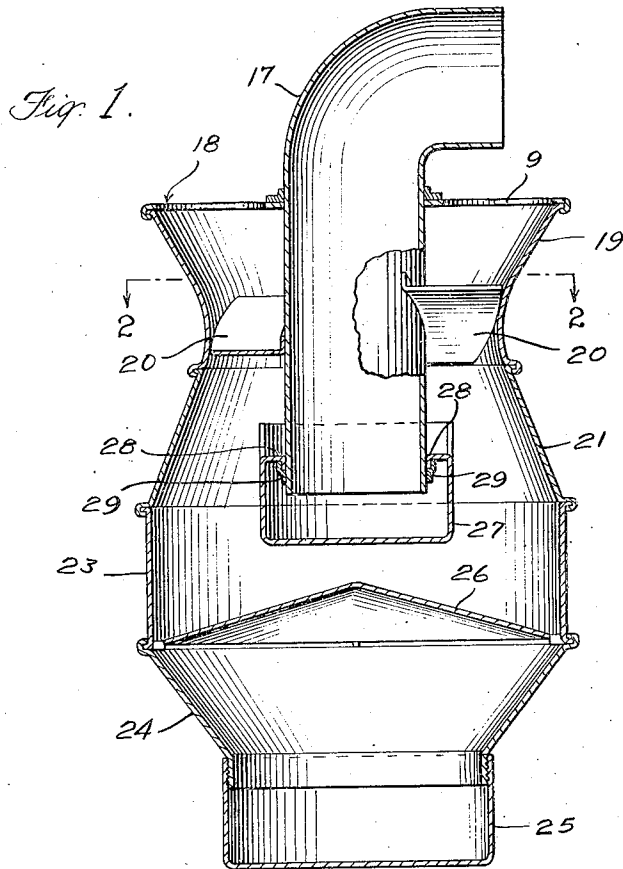
Sept. 5, 1933.

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1,925,373

AIR CLEANER

Filed June 3, 1927



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1,925, 373

AIR CLEANER

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Application June 3, 1927. Serial No. 196,174

1 Claim. (Cl. 183—92)

This invention relates to improvements in air cleaners for removing dust and other foreign matter from the air about to enter the air intake of an internal combustion engine, and is a continuation in part of my application for air cleaners, Serial No. 300,617, filed May 29, 1919 issued into Patent No. 1,708,122 April 9th, 1929.

One of the objects of the invention is the provision of a cleaner of this character which shall accomplish the cleaning operation without the use of a sieve or dust-tight cloth, either of which when it becomes dirty chokes the air inlet and hence requires attention at frequent intervals.

A further object is the provision of a dust receptacle in which the dust and foreign particles are deposited, said receptacle being arranged to permit ready removal for cleaning purposes.

Other objects and objects relating to details of construction and economies of manufacture, will appear as I proceed with the description of those embodiments of the invention, which for the purposes of the present application, I have illustrated in the accompanying drawing, in which:

Figure 1 is a view partly in vertical section of one form of my invention; and

Figure 2 is a cross section, substantially on the line 2—2 of Figure 1.

In the drawing is illustrated a structure which depends for its operation upon what I term the centrifugal principle. In this form of the invention, the cleaner casing is attached to and supported from the air exit pipe, which is intended to be secured to the air intake pipe of a gas engine. Any suitable connection may be employed for this purpose. The air exit pipe 17 extends well down into the casing, the top 18 of which is secured to the pipe by soldering or in any other suitable way. The top 18 is provided with large air inlet openings 9 separated by arms of sufficient widths only to insure the support of the cleaner upon the exit pipe 17. The upper section 19 of the casing is constructed at its lower end to form a portion of relatively small diameter, in which are positioned spiral fins 20. Preferably there are several of these fins, six being illustrated in the drawing (see Fig. 2), but the exact number is, of course, immaterial. As shown, they are attached to the pipe 17, which constitutes a satisfactory and convenient method of mounting them. The next lower section 21 flares outwardly again, the two sections constituting a Venturi tube with the spiral fins 20 at the smallest portion thereof, and hence the position of most rapid movement of the entering air. Consequently, the air is given a greater rotary impetus than it could obtain by

the use of spiral passageways alone. A cylindrical section 23 is attached to the bottom of section 21 and below the section 23 is an inwardly sloping section 24 threaded at its lower end to receive a correspondingly threaded dust cup 25. At the juncture of sections 23 and 24, there is supported a slightly conical baffle plate 26, spaced from the casing all the way around in order to provide an annular opening through which dust, which has collected upon the side walls of the casing and upon the top of the baffle plate 26, may pass and be directed downwardly by the sloping walls of the section 24 into the removable dust cup 25.

I may also employ a baffle 27 of cup shape, which I support removably upon the air exit pipe 17, the upper end of the cup being slitted to provide lips 28, which fit into sockets 29 carried by the pipe 17. The cup may be disengaged by lifting it slightly and then rotating it sufficiently to permit the lips 28 to pass down between the sockets 29. While most of the dust has been removed from the air when it enters the cup baffle 27, it is advisable to provide for the easy removal of whatever dust may be deposited therein.

In the operation of the device, air after leaving the bottoms of the spiral fins, has a rapid motion in a circular direction. This motion continues in the enlarged space below the fins, and because of it the air is classified according to its dust content, the heavier air, which is the air containing the most dust, being thrown by centrifugal force to the outside while the lighter and cleaner air collects near the middle of the casing and passes out through the outlet pipe 17. As the heavier air containing dust moves along the inner walls of the casing, friction causes the dust to be deposited upon the casing wall, and the air, being thereby lightened, is crowded back to the center and thence to the air exit pipe. The center baffles, 26 and 27 also produce further surface friction upon the air, causing still more of the dust particles to be deposited before the air is taken into the engine. The cup baffle 27 in the particular arrangement illustrated in Fig. 1 serves also to abruptly change the direction of the air stream passing through the cleaner to the clean air outlet tube 17 to further separate dust particles from the air. The bottom surface of the cup baffle 27 produces this effect to a much greater extent than does the top surface. Whatever dust is deposited upon the baffles and upon the casing walls gradually finds its way down into the dust cup, which may be removed and emptied at intervals.

I am aware that the particular embodiments of my invention above described, and illustrated in

the accompanying drawing, are susceptible of considerable variation without departing from the spirit thereof, and therefore I desire to claim my invention broadly as well as specifically, as indicated by the appended claim.

Having thus described my invention, what I claim is:

In an air cleaner, the combination of a casing, a clean air discharge port communicating with the interior of the casing adjacent its axis, means

at one end of the casing for imparting a whirling motion to the entering air stream, an annular channel at the other end of the casing for retaining the dust-laden portions of the air stream, a dust discharge outlet leading from said channel, a cap surrounding the last-named end of the casing and forming with the wall of said channel a dust collector into which said dust outlet discharges.

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