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AIR CLEANING APPARATUS

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Fig. 1.

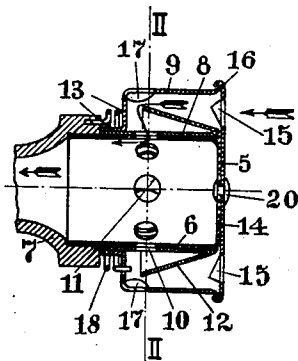
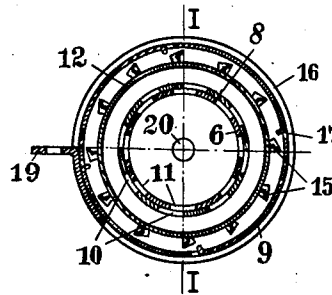


Fig. 2.



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AIR CLEANING APPARATUS

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The invention relates to an air cleaning or dry filtering apparatus for internal combustion engines in which dust and other similar impurities carried with the air are removed.

The object of the invention is to impart to the said impurities a force which will eliminate them from the air by moving them out of the air current.

This object is attained by giving the air a quick rotative movement in a casing through special leading walls located near the admission openings so that centrifugal force acting upon the dust and other bodies will force them outwards towards the circumferential wall of the housing, and by providing apertures in said walls through which the separated bodies may escape. Moreover, baffle-plates are preferably arranged in the way of the said bodies with the view to catch and lead them to the atmosphere.

This effect may be aided when centrifugal force is increased by accelerating the velocity of the whirl formed in the casing. This result can be obtained through a gradual decrease of the cross-section of the air passage, its radial distance from the axis thereby being increased, which effect can be obtained by the arrangement of a co-axial conical leading wall.

In the apparatus a strongly marked alteration of the direction of the air current near the said dust dismissing apertures is further used to separate the air from the bodies moved in opposite direction by centrifugal force at that place.

To permit quantitative regulation of the air delivered, relatively movable parts having admission ports can be so adjusted as to vary the width of the air passage in conformity with the work of the motor, means being provided which enable the control of the apparatus by the driver or automatically.

An embodiment of the air cleaning or filtering apparatus according to the invention is illustrated in the accompanying drawing, which forms a part of this specification and in which—

Fig. 1 is an axial sectional elevation of the complete apparatus, and

Fig. 2 is a cross-section on the broken line II—II of Fig. 1.

Like numerals denote like parts in both figures of the drawing.

The air cleaning apparatus is composed of an internal shell or sleeve 6 closed at its free end by a bottom 5 and fastened at its other extremity to the end of the air inlet pipe 7 leading to the carbureter, and an outer regulating device easily rotatable upon the sleeve 6 to the bottom 5 of which it is connected by a pivot, such as a rivet 20 for example. The said regulating device which is intended not only for modifying the quantity of air taken in but also for eliminating solid particles comprises a housing or shell 9 enclosing the sleeve 6, and an interior part 8 which is mounted on the sleeve 6 and adapted to be rotated thereon with a tight fit. This outer casing 9 is attached to a disc 14 by means of a bordering engagement 16 while its other end is contracted and connected to the extremity of the part 8 at the places 13. Thus the parts 8, 9, 13, 14 form an outer casing and can be rotated in unison on the sleeve 6 by means of a lug 19 fastened thereto and a connecting rod or cord fixed to the lug and being accessible to the driver. A helical spring 18 located between the pipe 7 and the outer casing engaging with its ends the said members, respectively, is disposed to return the casing 9 to its initial position.

Air admission apertures are made in the disc 14, lugs 15 being partly stamped out and bent inwards along a radial line to assume an oblique or inclined position with respect to the disc 14, thus forming deflecting vanes by which the entering air is given a helically flowing movement. From the adjacent end of the sleeve 8 a conical plate or flange 12 rises outwards, narrowing the rear part of the annular air passage in the casing 9 till nearly the contraction 13. In this angle of the casing a plurality of openings are formed in the wall 9, to enable the solid bodies to be discharged to the atmosphere, baffle plates 17 arranged on the edges of the openings assist-

ing this removal of the said bodies. Interiorly of the conical flange 12 coincident ports 10 and 11 are made in the sleeves 8 and 6, respectively, and will control the air supply when the regulating device is rotated on the sleeve 6. Those openings may then either register with each other or be so adjusted that the passages formed by them are more or less closed, as is obvious from Figs. 1 and 2 of the drawing.

The air cleaning apparatus operates as follows: The current of air sucked in through the openings 15 in the direction of the arrows and subsequently rotating in the annular chamber is directed radially outwards in the passage by the cone 12. Then the solid particles entrained are thrown outwards by centrifugal force so that they finally strike the wings 17 and are eliminated through the openings arranged in front of the same. At this point the current of the air is deviated towards the center and flows through the ports 10 and 11 of the sleeves into the inner space of the sleeve 6 and through the suction pipe 7 to the carbureter. By turning the regulating device 8, 9, 12, the driver can more or less shut the openings 10 and 11 and so throttle the current of air.

The new device, which is entirely made of sheet metal, is light and cheap and results in a good cleaning of the air on account of the particular way of guiding the air.

What I claim is—

1. In an air cleaning device, the combination of a stationary sleeve attached to the air suction pipe of a combustion engine, with a rotatable case mounted on the said stationary sleeve, leading faces arranged in the air admission openings of the said case and adapted to impart to the air a helical rotation, discharge openings for the particles to be eliminated, and coincident control passages in the relatively rotatable sleeve and case, permitting regulation of the quantity of air supply.

2. In an air cleaning device of the kind de-

scribed, the combination with a stationary air duct, of a case rotatably arranged upon said duct, oblique leading faces disposed near air admission openings of the case, discharge openings for the eliminated particles, a conical deflecting flange connected to the case, and coincident control ports in the said duct and case.

3. In an air cleaning device, the combination with an air suction sleeve, of a casing having its inner confining wall rotatably mounted on said sleeve, air deflecting wings near the admission openings of the casing, a conical flange disposed in the casing and adapted to direct the air outwards, baffle plates near the discharge for the eliminated particles, coincident air controlling ports in the said sleeve and casing, and means yieldingly resisting but permitting rotation of said casing and control of said ports.

4. In an air cleaning device for the purpose described, the combination with an air suction sleeve, of a casing having its inner wall rotatably mounted on said sleeve and providing a meandering air way in connection with the sleeve, air admission passages at one end of the casing, deflecting wings behind the said admission passages adapted to impart the air a helical movement within the casing, a conical flange located in the casing and capable of directing the air against the outer confining wall of the casing, an angular contraction at the opposite end of the casing, discharge passages provided in the wall of the casing near the said contraction, baffle plates behind the discharge passages and adapted to catch and remove the eliminated particles outwards, coincident air controlling ports provided in the said sleeve and inner wall of the casing inside the conical flange, means for rotatably adjusting the casing, and spring actuated means automatically returning the casing to its normal position.

In testimony whereof I have signed my name to this specification.

ALFRED LESAGE.