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AIR CLEANER

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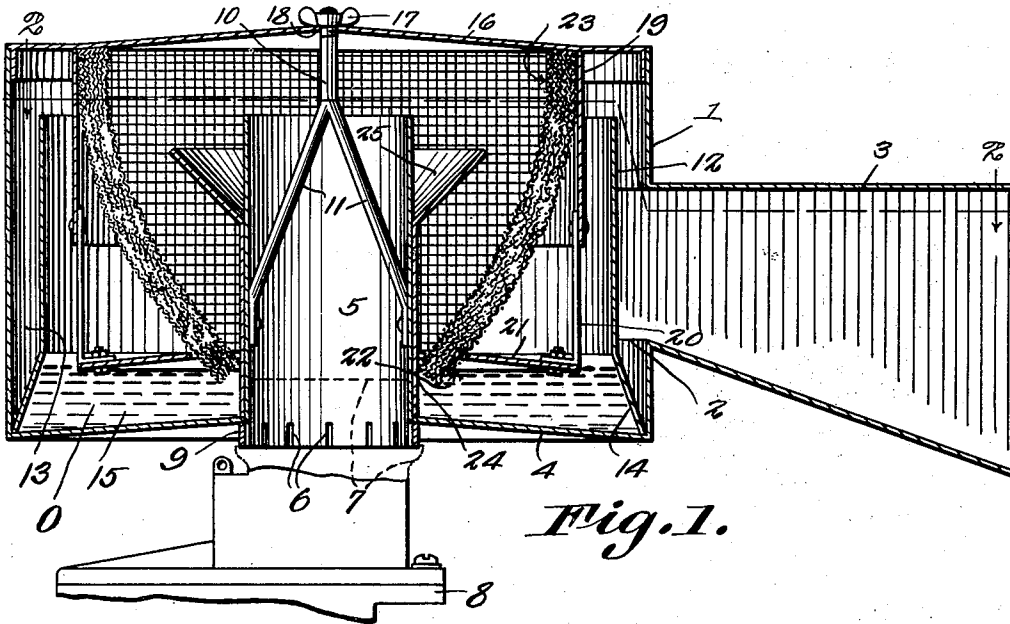


Fig. 1.

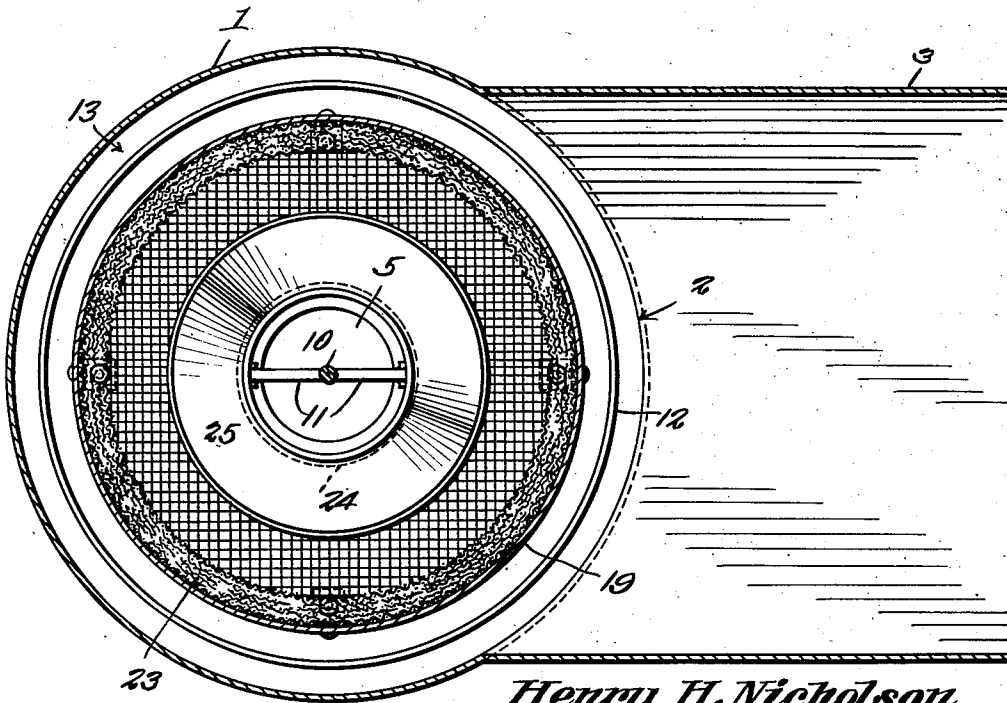


Fig. 2.

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AIR CLEANER

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1 Claim. (Cl. 183—8)

This invention relates to air cleaners for use in connection with the carburetors of internal combustion engines.

One of the objects of the invention is to provide an air cleaner which is simple in construction, the parts of which can be readily separated for the purpose of cleaning and making repairs, and which acts not only to remove practically all impurities from the air prior to entering the carbureter, but also maintain a balanced air flow under varying conditions.

A still further object is to provide an air cleaner utilizing oil as a washing medium and also utilizing a means whereby any globules of oil which may be carried past the filtering means by the air stream, will be prevented from entering the carbureter.

A further object is to provide means whereby the pressure of air flowing through the cleaner is utilized to force oil into a filtering element thereby to increase the efficiency of the device.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claim, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

In the accompanying drawing the preferred form of the invention has been shown.

In said drawing

Figure 1 is a central vertical longitudinal section through the air cleaner a portion of the carbureter to which it is applied being shown partly by full lines and partly by broken lines.

Figure 2 is a section on line 2—2 Figure 1.

Referring to the figures by characters of reference 1 designates a casing which is preferably cylindrical and formed with an inlet slot 2 extending partly therearound. This slot is surrounded by one end of an air intake funnel 3 extending outwardly from the casing and adapted, in use, to project in such a direction as to receive a current of air. For example if the carbureter is used on a motor vehicle, this air intake funnel 3 will be extended forwardly.

The casing 1 has its bottom 4 inclined upwardly toward a concentric outflow tube 5 extending upwardly within the central portion of the casing and open at both ends, the lower portion of this tube being projected below the bottom 4 and formed with longitudinal slits 6 so that said end can be contracted about the inlet

end 7 of a carbureter 8, the tube being held contracted by an encircling band 9 or the like.

A threaded stem 10 is located above the center of the tube 5 and is joined to said tube in any suitable manner, as by means of downwardly diverging legs 11, riveted or otherwise attached to the inner surface of the tube.

Secured in any suitable manner within casing 1 is a cylindrical deflecting baffle 12 spaced from the wall of the casing to provide an annular chamber 13 and the lower end of this baffle can be flared and soldered or otherwise joined to the bottom 4, as shown at 14, thereby forming the annular wall of an oil chamber 15.

A lid 16 is removably seated on and within the upper portion of the casing 1 and is adapted to be held detachably in place by a nut 17 or the like engaging the threaded end of stem 10 which projects through a central opening 18 in the lid. This lid is provided with a depending cylindrical air deflecting baffle 19 which extends downwardly into the area surrounded by the baffle 12 and has hangers 20 depending therefrom, each hanger being attached to a plate 21 constituting an oil baffle. This plate is circular and is provided with a large central opening 22, the plate being inclined upwardly toward this opening and overlying the greater portion of the surface of the oil O contained within the chamber 15.

A filter 23 is fitted snugly within the upper portion of the baffle 19 and against the cover 16. This filter, which is circular in cross section, is made up of a number of layers of wire screens of fine mesh and the screen is so shaped as to taper downwardly along curved lines to its lower end which is located within the opening 22 and not only fits snugly against the wall of said opening but also against a sleeve 24 which extends downwardly to the bottom 4 of the casing and is slidably mounted on the outflow tube 5. This sleeve, which terminates below the upper end of the outflow tube, has its upper end flared to provide an oil baffle 25 which overhangs the greater portion of the lower part of the filter.

When lid 16 is removed by unscrewing the nut 17, the baffle 19, filter 23, baffle 21, and sleeve 24 can be lifted out of the casing 1 and the deflecting baffle 12. Thus the interior of the casing can be cleaned readily after which a desired quantity of oil can be poured into the casing so as to substantially fill the area defined by the flared lower end 14 of baffle 12. Cover 16 is then replaced, thereby moving the sleeve 24 into the position shown on the outflow tube 5 and bringing the deflecting baffle 19 into the space defined

by the distributing baffle 12. The oil baffle or plate 21 will at the same time be brought close to the surface of the oil so as to overlie it and the lower end of the filter will be caused to project a short distance into the body of oil. The cover is then secured in place and the parts are thus held properly assembled. The entire filter can be connected to the carbureter either before or after the operation above described.

If this air cleaner is used on a motor vehicle, the casing 1 is set in such a position that the intake funnel will be extended forwardly in the direction of travel. Therefore, during the forward movement of the vehicle, a current of air will be set up within the funnel to the inlet opening or slot 2 where this moving body of air will come against the cylindrical distributing baffle 12 and flow backwardly within the annular chamber 13. From this chamber the evenly distributed air will flow upwardly over the top edge of baffle 12 and thence downwardly within the area defined by said baffle and the deflecting baffle 19 which latter, obviously, acts to compel the air to flow downwardly. As the moving air makes an abrupt turn under the lower edge of the deflecting baffle 19, any solid particles carried thereby will be thrown downwardly onto the surface of the oil exposed beyond the edge of plate 21. Any air travelling downwardly against and below the surface of the oil as a result of the pressure of the air within the cleaner, will subsequently travel along the bottom of plate 21 carrying globules of oil with it to the lower portion of the filter. All of the air will ultimately escape through the filter and this filter soon becomes saturated with oil so that a final cleaning operation takes place as the air flows through the filter. Should any globules of oil be held in suspension by the air as it leaves the filter and is sucked straight toward the end of tube 5, said globules would strike against the baffle 25 because it is in the direct line of flow, and they are thus caused to rebound downwardly against the filter and thus be prevented from entering the out flow tube 5 and the carbureter 8.

Importance is attached to the fact that, by reason of the new and novel assembly of parts, the cleaner can be separated readily for the purpose of cleaning the parts. Furthermore the effectiveness of the filter under varying conditions can be maintained as desired simply by adding layers of screening material to the filter or by removing some of the layers.

The oil baffle plate 21 acts to hold the lower portion of the filter properly contacted about the sleeve 24 so that there is no possibility of air

passing upwardly from the circulating oil without passing through the filter.

The pressure of air upon the surface of the oil beyond the outer edge of plate 21 of course tends to force portions of the oil constantly up into the filter so as to maintain saturation thereof and effect more efficient cleaning of the air than would be possible otherwise.

What is claimed is:

An air cleaner for carbureters including a cylindrical casing, an outflow tube therein and opening downwardly through the bottom thereof, the upper end of the tube being open and below the top of the casing, a flared oil baffle extending around the upper portion of the tube, an upwardly extended baffle mounted on the bottom of the casing and spaced inwardly from the wall of the casing to provide a concentric air chamber within the casing opening close to the top into the casing, an intake funnel extending from the casing and opening into said chamber, a lid mounted on the casing and constituting a closure therefor, means for detachably securing the lid in closed position, a baffle concentric with the tube and casing and depending from the lid within the space surrounded by the upwardly extending baffle, said baffles being spaced apart, the flared baffle on the tube being positioned to prevent flow of air along a straight line from the lower edge of the depending baffle to the upper edge of the tube, a downwardly tapered annular filter carried by the lid and extending from the upper end portion of the depending baffle downwardly to the tube, said filter being concentric with the tube and having its lower end fitted snugly thereabout, a plate spaced from and concentric with the tube and within the space surrounded by the upwardly extending baffle, means connecting said plate to the depending baffle for supporting the plate around the lower portion of the filter and above the bottom of the casing, and a body of oil within the casing, the level of the oil being such as to receive the lower end of the filter and be in close proximity to the plate, the positions of the baffles and oil being such that air entering the annular chamber from the funnel will flow around the upwardly extending baffle and upwardly to the lid and be deflected over said baffle and by the lid and downwardly between the depending and upwardly extending baffles to the surface of the oil and then flow upwardly over the plate to and through the filter and around the conical baffle to the upper end of the outflow tube.

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