July 29, 1930. W. G. DUNN 1,771,880

AIR CLEANER FOR CARBURETORS

Filed Aug. 6, 1928

Fig. 1.

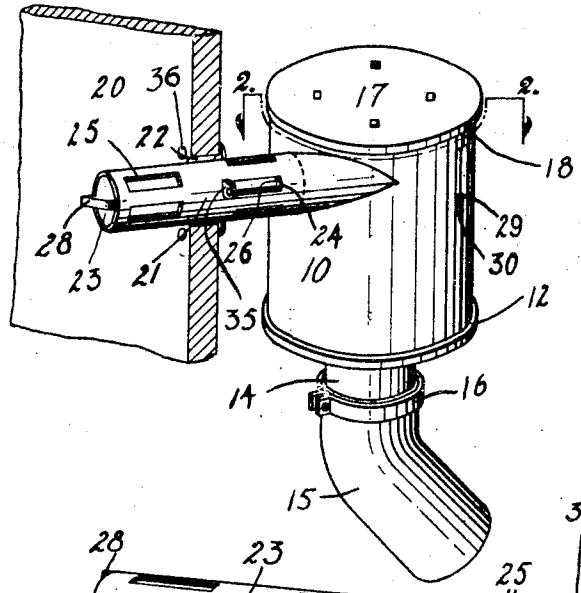
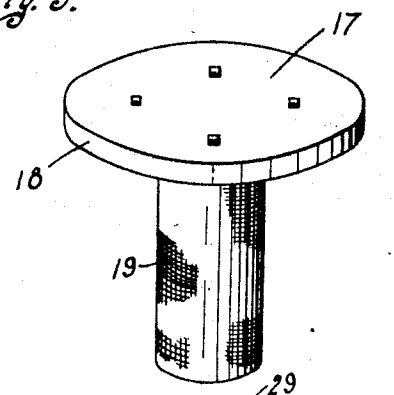



Fig. 3.



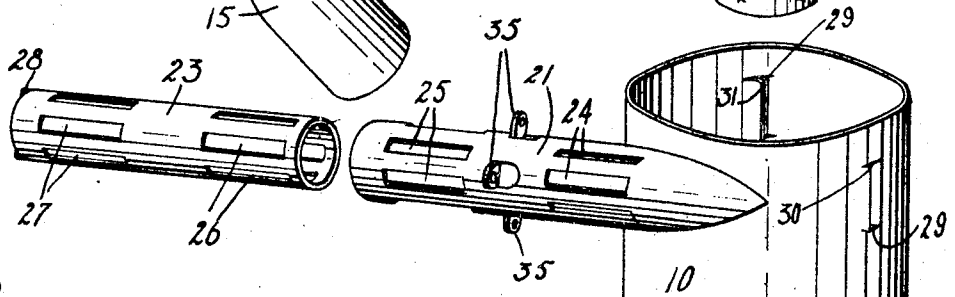
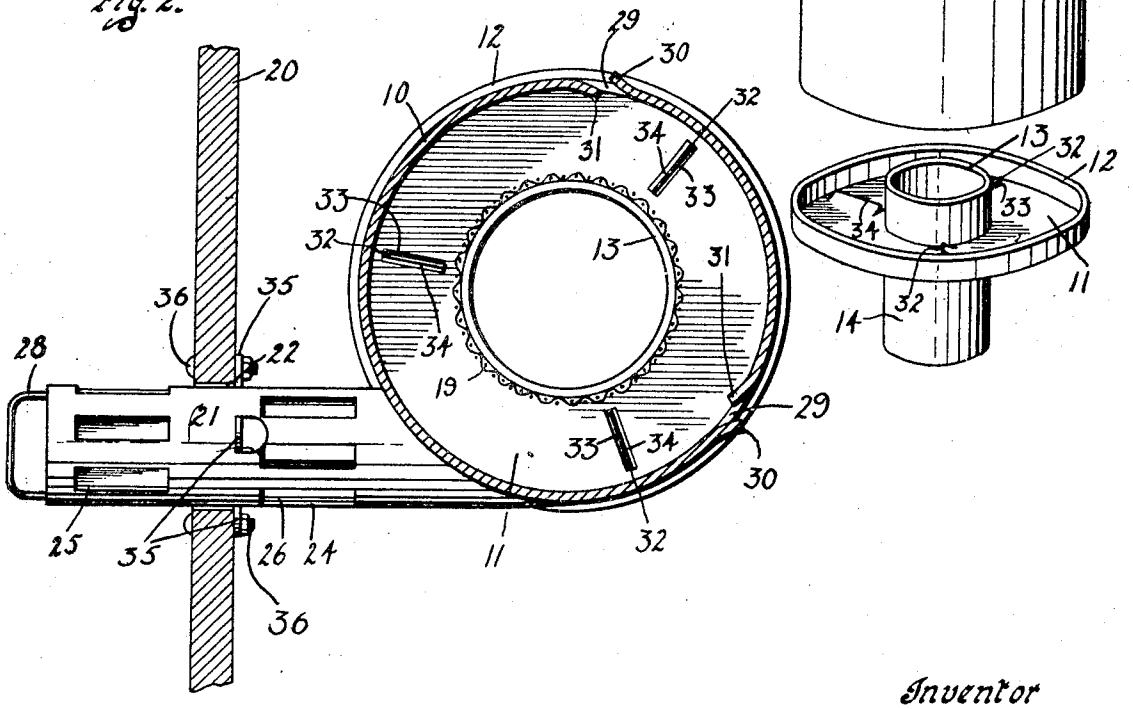




Fig. 2.




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# UNITED STATES PATENT OFFICE

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## AIR CLEANER FOR CARBURETORS

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The primary object of this invention is to provide an improved construction for a device for receiving and cleaning atmospheric air preliminary to its introduction to the carburetor of an internal combustion motor to prevent the entrance of dirt and other foreign particles thereto.

A further object of the invention is to provide an improved air cleaning device for carburetors which has a manually operated controlling means to permit the reception of air thereto either from the interior of a vehicle body or from a point outside the body, such as under the hood.

Still another object of the invention is to provide an air cleaning device which has a cleaner housing and an intake thereto so arranged that the air entering the housing is caused to travel in a circumferential path and dust or other foreign particles carried by the air is thrown off by centrifugal force.

A further object is to provide a device of the character described, which is simple and inexpensive to manufacture and which is easily installed and which may be readily taken apart for cleaning purposes.

Still another object is to provide an improved manually operated control device for the selective control for admission of air to the cleaner housing.

With these and other objects in view my invention consists in the construction, arrangement and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a perspective view partly in section, showing my improved air cleaner device mounted in position for use.

Figure 2 is a horizontal section on the line 2—2 of Figure 1, illustrating particularly the interior of the cleaner housing.

Figure 3 is a perspective view showing the different parts of the cleaner device in disassembled relation.

In the operation of internal combustion motors it is highly desirable to clean and purify the air which is employed in the fuel mixture before its reception into the carburetor in order to remove dust, dirt, and other foreign particles and thus prevent abrasive action on the cylinder wall, as well as to produce a better fuel mixture.

In the accompanying drawing, I have shown a cleaner device including a cleaner housing which is formed of a cylindrical side wall 10 open at both ends. A removable bottom 11 is provided for the cylindrical wall 10 which has a peripheral flange 12 adapted for frictional engagement with the lower portion of the wall. The bottom member 11 is formed with a central opening through which a sleeve is extended and secured to provide an upwardly extending nipple 13 and a downwardly extending nipple 14.

The cleaner housing is adapted to be suitably connected to a carburetor by means of a pipe or hose 15, which engages the downwardly extending nipple 14 and is secured thereto in any suitable manner as by means of a clamping ring 16.

The cleaner wall 10 also is provided with a removable top member or lid 17, having a peripheral flange 18 adapted for frictional engagement with the upper marginal portion of the wall. Fixed centrally to and depending from the lid 17 is a gauze cylinder 19, which is adapted to extend downwardly within the cleaner housing and to engage the upwardly extending nipple 13 of the bottom member when the parts are assembled.

The cleaner housing is mounted in any suitable location, preferably, beneath the hood of a motor vehicle and just forwardly of the dash 20.

The means for admitting air to the cleaner housing includes a damper sleeve 21 of cylindrical form arranged near the top and to one side of the cylindrical wall 10 and communicating with the interior of the housing on a line substantially tangential thereof.

The damper sleeve 21 preferably is extended through a hole 22 in the dash 20 and frictionally embraces a cylindrical damper member 23. The damper sleeve 21 preferably is formed with two series of air entrance openings located on opposite sides of the dash 20.

The air entrance means comprises a plurality of slotted openings 24 arranged circumferentially of the inner end portion of the sleeve 21 and extending longitudinally thereof and a similar series of slotted openings 25 near the free end of said sleeve or in other words, that portion located within the vehicle body.

The slotted openings 24 are staggered relative to the slotted openings 25 or in other words, are out of longitudinal alignment therewith.

The damper member 23 is formed with a series of slotted openings 26 adapted to register at times with the slotted openings 24 of the sleeve and is also formed with a series of slotted openings 27 adapted to register at times with the openings 25 of the sleeve.

The slotted openings 26 and 27 are in longitudinal alignment so that when one set of openings of the damper member 23 are arranged to register with the corresponding set of openings of the sleeve 21, it follows that the other set of openings are out of registry.

The damper member 23 is formed at its end with a handle 28 by which it may be manipulated by rotating it slightly in the sleeve 21 to bring one set or another of the openings into alignment.

Thus, I have provided means whereby air may be admitted to the cleaner housing selectively either from the interior of the vehicle body or from beneath the engine hood.

The cylindrical wall 10 is formed with a series of vertical slits to provide exit openings 29, which preferably are in substantially the same horizontal plane as the mouth of the sleeve 21.

The material at the initial side of each slit 29, with reference to the direction of travel of air in the housing, is bent to produce an outwardly projecting lip 30, while the material at the opposite or terminal side is bent to form an inwardly projecting lip 31.

Since the air entering the cleaner housing comes in in a substantially tangential stream, it follows that it travels in a circumferential path within the housing so that dust and other foreign particles will be caused to pass out through the openings 29 by centrifugal force.

Some particles may, because of their weight, drop to the bottom of the cleaner housing and to permit the escape of such particles, I have provided in the bottom member 11, a series of exit openings 32, which are formed similarly to the exit openings 29.

In other words, the exit openings 32 have at their initial sides, outwardly extending lips 33 and at their terminal sides, inwardly extending lips 34.

It will be understood that air is drawn into the cleaner housing by the suction of the engine and travels with considerable force, so that the centrifugal force of heavy particles is sufficient to carry the greater part of such particles out of the housing.

This suction force also causes the air in the cleaner housing to be drawn through the gauze cylinder 19 and into the tube 16, whence it passes to the carburetor and is employed in the fuel mixture.

The gauze cylinder 19 preferably is of very fine mesh so as to exclude the passage of any particles of dust or other foreign substances which may still remain in the air when it reaches said gauze.

Thus, the air supplied to the carburetor is very thoroughly and effectively cleaned before being admitted to the fuel mixture.

By providing the manual control means, including the sleeve 21 and the damper member 23, I make it possible to selectively admit the air either from the interior or from a point outside thereof. At times, it may be desirable to take the air from the vehicle body and at other times, it may be undesirable to do so.

By arranging the control device so that air for the carburetor is drawn from the interior of the vehicle body, I have made it possible not only to use relatively cleaner air for the fuel mixture, irrespective of the action of the cleaner device itself, but have also provided for establishing a circulation and insuring a constant change of air in the vehicle body which is made effective by the suction of the engine.

The sleeve 21 is formed with radially extending ears 35 which are secured to the dash 20 by bolts 36 or the like.

It is obvious that the lid 17 carrying the gauze cylinder 19 may be removed whenever desired for cleaning said cylinder of dust particles which may adhere thereto.

Also, that the bottom member 11 may be readily removed for cleaning out any foreign particles which may be contained therein.

I have provided a device of the character described, which is simple and inexpensive and which is easily installed and is efficient for the purpose for which it is designed.

I claim as my invention:

1. An air cleaning device comprising a cylindrical cleaner housing, an entrance opening thereto arranged substantially tangentially of the housing wall, an air exit from said housing, a gauze cleaning member arranged between the entrance and exit openings, the housing wall being formed with openings for the passage of foreign substances by centrifugal force from the air passing from the entrance to the exit opening, the bottom of said housing also being formed with openings for the passage of foreign substances which may drop from the passing air.

2. An air cleaning device comprising a cy-

lindrical cleaner housing, an entrance opening thereto arranged substantially tangentially of the housing wall, an air exit from said housing, a gauze cleaning member arranged between the entrance and exit openings, the housing wall being formed with openings for the passage of foreign substances by centrifugal force from the air passing from the entrance to the exit opening, the bottom of said housing also being formed with openings for the passage of foreign substances which may drop from the passing air, the openings of said wall and bottom being formed with marginal lips for directing substances outwardly of the housing.

3. An air cleaning device comprising a cylindrical cleaner housing, an air entrance pipe leading to said housing and arranged parallel with but spaced from a diameter of said housing so that air passing to the housing will travel circumferentially therein, said housing being formed with openings in its side wall for the escape of foreign objects in the air by centrifugal force, said housing being formed with a substantially central air exit opening, a gauze cleaning member arranged concentrically in said housing and surrounding the air exit opening, said air entrance pipe being formed with longitudinally spaced openings in its wall, and a tubular damper adjustably mounted relative to said pipe and formed with openings adapted for selective registration with the openings therein.

4. An air cleaning device for carburetors, comprising a cleaner housing, an air entrance pipe opening to said housing at one side of the center thereof, an air exit opening spaced from the entrance opening, a fine mesh cleaning member mounted in said housing between the entrance and exit openings, means for permitting the passage of foreign objects from the housing when separated from the air traveling from the entrance to the exit opening, said entrance pipe being formed with longitudinally spaced openings for the admission of atmospheric air, and a tubular damper adjustably mounted in said pipe and formed with openings adapted to register selectively with the spaced openings thereof.

Des Moines, Iowa, July 21, 1928.

WILLIAM G. DUNN.