

June 15, 1937.

G. L. HEGLAR

2,083,649

AIR CLEANER

Filed May 5, 1936

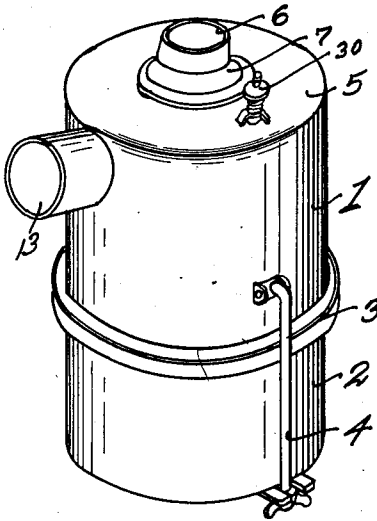


Fig. 1

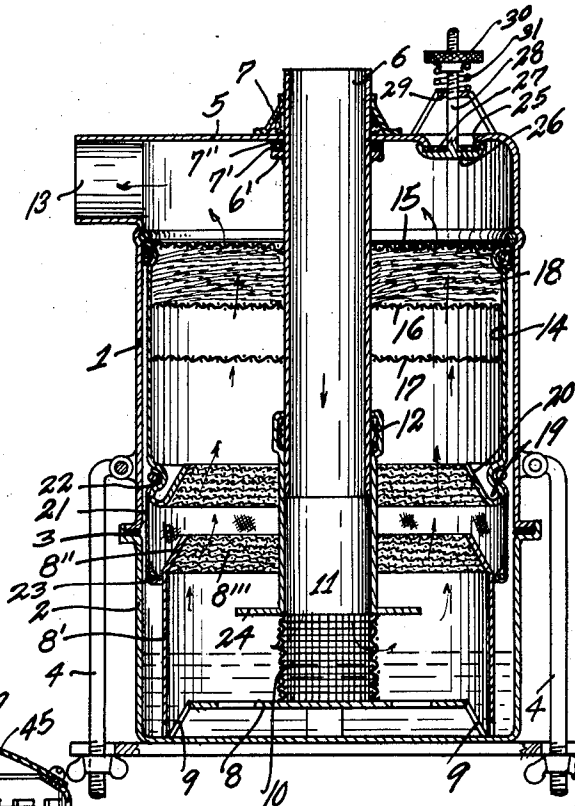


Fig. 2

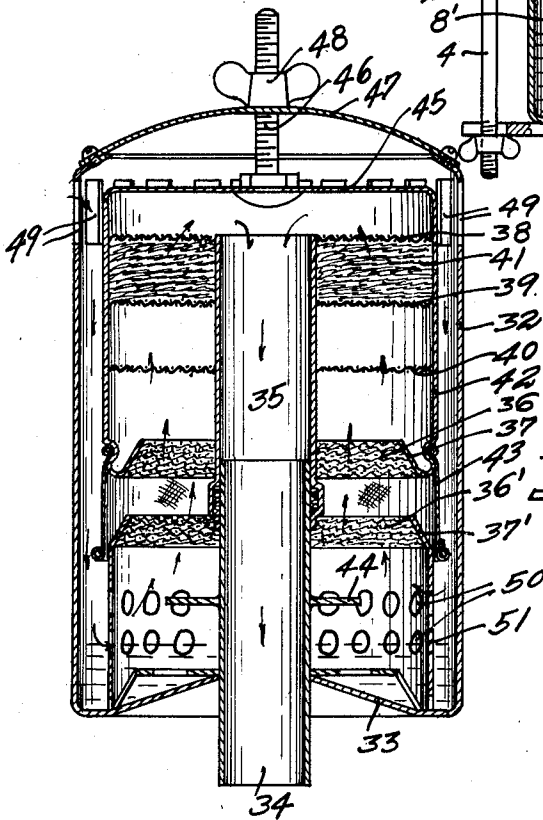


Fig. 3

INVENTOR.
George L. Heglar
BY *Glenn L. Fish*
ATTORNEY.

UNITED STATES PATENT OFFICE

2,083,649

AIR CLEANER

George L. Heglar, Almira, Wash.

Application May 5, 1936, Serial No. 77,960

5 Claims. (Cl. 183—48)

This invention relates to an improved air cleaner and washer and one object of the invention is to provide a device of this character which will serve very effectively to remove dust from air prior to entry of the air into the carburetor of an internal combustion engine.

Another object of the invention is to so form the cleaner that dust will be very effectively removed from the air and deposited in oil in the cleaner, any oil which may be taken up by the air as it passes through the cleaner being removed therefrom before the air leaves the cleaner.

Another object of the invention is to provide an air cleaner of such construction that it may be easily taken apart and thoroughly cleaned, then easily and quickly reassembled.

Another object of the invention is to provide a cleaner having an auxiliary air inlet which is normally closed but will be opened by suction when the engine is running at high speed and more than the normal quantity of air is needed.

The invention is illustrated in the accompanying drawing, wherein

Figure 1 is a perspective view of the improved air washer.

Figure 2 is a sectional view taken vertically through the cleaner.

Figure 3 is a vertical sectional view of a cleaner having a modified construction.

This improved cleaner has a housing formed of upper and lower sections 1 and 2 which are cylindrical and at their meeting ends are formed with outstanding flanges between which a gasket is disposed, as shown at 3, so that when the lower section is secured to the upper section by the fasteners 4 a tight joint will be formed. The latches are of a conventional construction and securely but detachably hold the lower section to the upper section.

The upper section is provided with an air inlet port at the center of the head 5 at the upper end of this section and through this opening extends the upper portion of a pipe 6 which is disposed axially of the housing and is held in its vertical position by the collar 7. The collar may be soldered to the head of the housing, a tight joint formed by packing held in place about the pipe by the collar. To further secure the said joint from leaking a gasket 7' is placed around the pipe 6 and capped with a metal ring 7"; these members are held in place between the top 5 and flange 6' extending from the pipe. Referring to Figure 2 it will be seen that the pipe divides the housing into an entrance chamber of passage and a larger chamber surrounding the

pipe and through which air passes on its way out of the cleaner.

The lower section or pan 2 is to be partially filled with oil and in this pan is placed a perforated plate or disk 8 which is provided with supporting legs 9 serving to retain the disk in spaced relation to the bottom of the pan. A cylindrical member 8' extends from the bottom of the pan and terminates with an angular flange 8'' to which a series of screens 8''' are attached. The cylinder being spaced from the walls of the pan to provide a passage for any return oil that might have been carried upward with the air. Over the center of the disk 8 is disposed a tubular screen 10 which is joined to a tube or pipe 11 of less length than the pipe 6 but of sufficient diameter to fit snugly about the pipe 6. The upper portion of the tube 11 is enlarged to form a chamber in which packing is placed, as shown at 12, and thus prevent leakage between the pipes. Therefore, air will pass down through the two pipes without escaping prior to reaching the lower end of the pipe 11. As the screen 10 is immersed in the oil, the air will make contact with the oil and a portion of the air forces its way downwardly into the oil and then upwardly through the oil before passing upwardly through the housing about the pipes to the outlet neck 13 which projects from a side of the housing at the upper end of the upper section 1 and may be connected with the air inlet of a carburetor in any desired manner.

A cartridge having a cylindrical casing 14 fits snugly within the upper housing section and has its upper end closed by a disc 15 of perforated sheet metal which fits tightly about the pipe 6 and is disposed even with the lower portion of the outlet neck 13. Discs 16 and 17 of wire screen are spaced from each other below the disc 15 and between the discs 15 and 16 is placed a porous pad 18 formed of steel wool and as the air passes through the screens and the porous pad before reaching the outlet neck, oil in suspension will be removed from the air before the air leaves the cleaner. The lower portion of the casing is bent inwardly and then upwardly to form a channel or seat 19 and a flange 20 which extends upwardly at an incline from the channel and serves as a confining element for screens which are disposed in massed formation about the upper end portion of the pipe or tube 11. A skirt 21 of canvas or other suitable fabric has its upper end portion secured in the channel 19, as shown at 22, and about its lower edge carries a wire 23 which retains the skirt in its proper shape with the lower edge of the

skirt normally a very short distance above the plane of a baffle plate 24 carried by the pipe 11. As the skirt is formed of fabric it may be drawn upwardly by increased suction created when speed of the engine is increased and free passage of air between cylinder 8' and walls of the housing will be permitted. When the lower housing section has been removed, the cartridge and the pipes can be easily withdrawn from the upper housing section and thoroughly cleaned and replaced.

When this air cleaner is in use, the neck 13 is connected with the air intake of a carburetor in any desired manner and suction created by the engine will draw air inwardly through the pipes 6 and 11. The air upon reaching the lower end of the pipe 11 passes through the screen 10 and dust and other foreign matter will be deposited in the oil with which the lower housing section or pan is filled. A certain amount of oil will pass upwardly with the air through the housing about the pipes and as this air passes through the screens and porous pad, the oil will be removed from it. Therefore, the clean air will be discharged through the outlet neck 13 and pass to the carburetor.

To compensate for excessive quantities of air which may be needed by an engine running at high speed, the head 5 of the upper housing section has been formed with an air inlet opening surrounded by an inwardly projecting flange 25. This opening is normally closed by a valve disc 26 provided with a gasket 27 to seat against the flange 25 when the valve is in a closed position. The stem 28 extends upwardly through the air inlet and through a bridge 29 which straddles the opening and the upper end portion of this stem is threaded to receive a nut 30 which bears against a spring 31 disposed about the stem and resting upon the bridge. Therefore, the valve will normally be held closed but may be drawn downwardly to an opened position by increase of suction created when the speed of the engine is increased. By adjusting the nut, tension of the spring may be regulated and the suction required to move the valve to an opened position controlled.

In Figure 3 there has been illustrated an air cleaner of a modified construction. In this embodiment of the invention the housing 32 has its bottom 33 formed with a central opening through which passes an air outlet pipe 34, the upper end of which is received in the lower portion of a pipe 35. The pipe 35 is surrounded by screens 36 and 36' the outer margins of which bear against a flange 37 and 37' corresponding to the flange 20 and 8' and there have also been provided screens 38, 39 and 40 together with a porous pad 41 of steel wool which is disposed between the screens 38 and 39. These screens and the porous pad fit about the pipe 35 within the casing 42 of a cartridge which fits loosely in the housing in spaced relation to walls thereof and at its lower end carries a skirt 43 corresponding to the skirt 21 and having its lower edge terminating adjacent a baffle plate 44 carried by the pipe 34 and a cylinder 51 supported on the bottom of the cleaner. A head 45 is provided for the upper end of the cartridge and carries a stem 46 which projects upwardly therefrom and passes through an opening formed at the center of a head 47 removably secured to walls of the housing at the upper end thereof. By turning the nut 48 carried by the stem, the cartridge may be vertically adjusted in the housing and the extent to

which walls of the cartridge overlap air inlet slots 49 formed in the walls of the housing regulated. It will thus be seen that the freedom with which air passes through the inlet slots may be regulated. When this form of cleaner is in use, the air enters through the slots 49 and passes downwardly between the cartridge and the walls of the housing until it reaches the lower end of the cleaner there passing through perforations 50 in cylinder 51 and then upwardly through the cartridge. Dirt and other heavy foreign matter is deposited in the oil and light dust and oil particles which may be taken up by the air will be removed as the air passes through the screens and the porous pad. Upon reaching the upper end portion of the cartridge, the air passes downwardly through the pipes 35 and 34 and will be delivered to the air intake of a carburetor. The skirt normally hangs vertically from the lower end of the cartridge but when an engine is run at sufficient speed to create excessive suction, the skirt will be drawn upwardly and thus provide more room between the lower edge of the skirt and the cylinder 50 for air to pass between the skirt and cylinder and ample air will be provided. An auxiliary air inlet controlled by a valve corresponding to the valve 26 may be provided in the head 47 of the housing, if so desired.

Having thus described the invention, what is claimed as new is:

1. An air cleaner comprising a housing having an upper section and a lower section detachably connected with the upper section, the upper section having an air outlet, an inlet pipe extending vertically in the upper section with its upper end projecting through the top thereof, a cylindrical casing fitting snugly in the upper section, a curtain depending from the casing about the lower end thereof, a perforated disc at the upper end of said casing disposed below the outlet, a screen disc in the casing below the perforated disc in spaced relation thereto, the perforated disc and screen having close fit about the pipe and being firmly secured to the casing for removal therewith as a unit from the upper housing section when the lower section is removed, a porous pad between the perforated disc and screen, a baffle plate supported in the lower housing section and spaced upwardly from the bottom thereof, a conduit rising from the baffle plate and detachably engaged about the lower end of said pipe, and a baffle disc about the conduit adjacent the lower end of said curtain.

2. An air cleaner comprising a housing having separable upper and lower sections, the upper section having an outlet at its upper end, an inlet tube extending vertically in said housing with its upper end portion projecting through the top of the upper section, and its lower end extending into the lower section, a casing fitting snugly within the upper section and having its lower portion provided with an inwardly extending flange and an external seat, a pad of porous material in said casing fitting about the tube adjacent the upper end of the casing, screen discs about said tube with their outer marginal edges bearing against said flange, a flexible skirt surrounding said casing and depending from the lower end thereof with its upper portion engaged in said seat, and a baffle plate carried by said tube and disposed adjacent the lower end of said skirt in spaced relation thereto.

3. An air cleaner comprising a housing having upper and lower sections detachably connected with each other, the upper section being formed

with an outlet in its side adjacent its upper end, an air inlet pipe extending vertically in the housing with its upper portion projecting through the top of the upper section and its lower portion extending into the lower section, a casing in the upper section fitting snugly therein, a fabric curtain secured about the lower end of said casing and depending therefrom, cleaning elements in the casing about said pipe, and a baffle carried by said pipe and disposed adjacent the lower end of said curtain in spaced relation thereto.

4. An air cleaner comprising a housing, a pipe extending vertically in said housing and projecting through one end thereof, the other end portion of the housing having an air passage in a side thereof, a casing in said housing about said tube in spaced relation to the tube, a curtain of flexible material depending from the lower end of said casing, cleaning means carried in said casing about said tube, and a baffle disc carried by the tube adjacent the lower end of said curtain in spaced relation thereto.

5. An air cleaner comprising a housing having a cylindrical body and upper and lower heads, air inlet openings being formed in the body adjacent the upper head, an air outlet tube extending vertically in said housing and having its lower portion projecting through the lower head and its upper end terminating below the upper head, a casing in said housing spaced from the cylindrical body and having a head at its upper end, the casing being open at its lower end, a curtain of fabric carried by and depending from the casing about the lower end thereof, air cleaning means in said casing about said tube, a baffle disc carried by said tube adjacent the lower end of said curtain, a threaded stem rising from the head of said casing and projecting through the upper head of said housing, and a nut threaded upon said stem to rest upon the upper head of the housing and support the casing in a vertically adjusted position in the housing.

GEORGE L. HEGLAR.