March 8, 1927. 1,619,954

W. L. OLMSTEAD ET AL

AIR STRAINER FOR COMBUSTION ENGINES

Filed July 21, 1919

Fig. 1

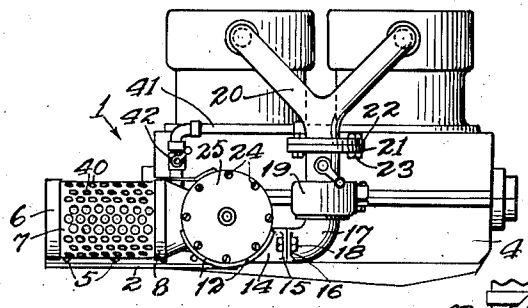


Fig. 4

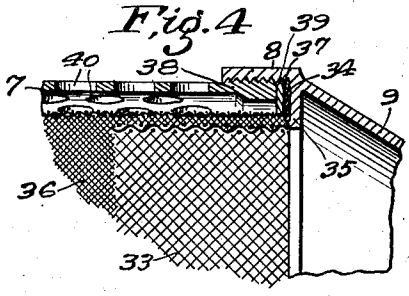


Fig. 2

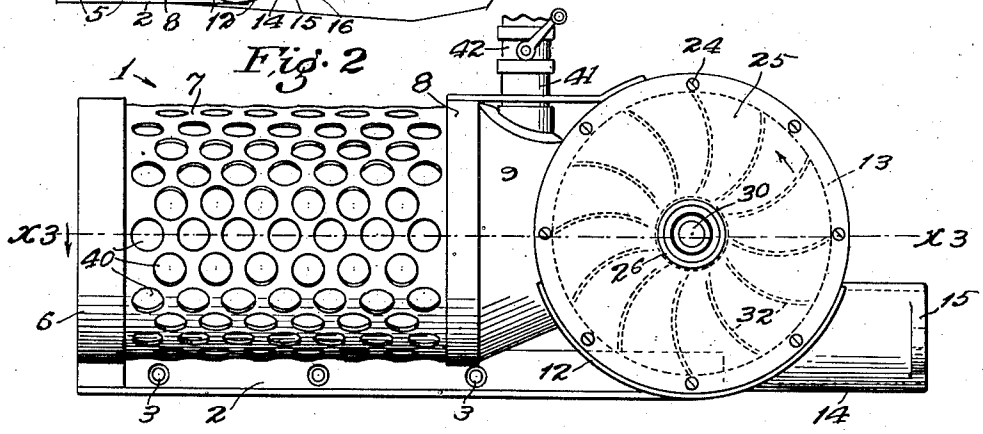
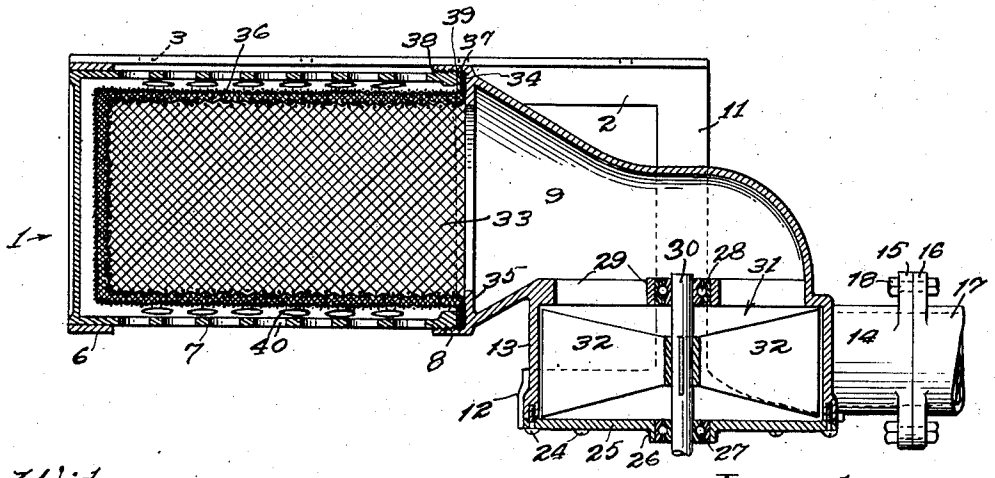


Fig. 3



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UNITED STATES PATENT OFFICE.

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AIR STRAINER FOR COMBUSTION ENGINES.

Application filed July 21, 1919. Serial No. 312,446.

This invention relates to air cleaners for combustion engines, and it may be said to consist of the provision of the new and novel features and in the improved construction, combination and arrangement of parts the purpose of which will be apparent to those skilled in the art, from a consideration of the preferred form of structure herein shown, described and claimed.

A feature of the invention is shown in the novel means for drawing screened air into the carbureter.

Another feature of the invention is shown in the means for by-passing a quantity of the air cleaned by the strainer to the inlet manifold; and a controlling means in connection therewith.

Another object of the invention is to so mount the screening device that it will be self-cleaning.

Other objects, advantages and features of the invention may appear from the accompanying drawings, the subjoined detailed description and the appended claims.

The drawings illustrate the invention.

Figure 1 is a side elevation of the apparatus attached to an engine, which latter is diagrammatically shown.

Fig. 2 is an enlarged view of the strainer similar to Fig. 1, with parts broken away; also showing the apparatus detached from the engine.

Fig. 3 is a section on the line x^3 of Fig. 2.

Fig. 4 is an enlarged fragmentary sectional elevation of the air strainers, parts broken away.

The air strainer 1 is preferably mounted in a bracket 2 which bracket has in the bottom portion the screw holes 3 by which it is secured by screws 5 to the engine 4. To one end of the bracket 2 there is the ring portion 6 in which is slidably fitted the perforated casing 7, which casing has its other end threaded to fit the socket end 8 of a hollow casting 9; and extending forward at the outer end of the bracket 2 is an arm 11 which has on its outer end the saddle portion 12 that fits the periphery on the underside of the circular blower housing 13, and preferably the casting 9 and circular housing are integral. It will be noted that with the construction as described above that the strainer 1 is secured to the engine by the bracket 2 to which the strainer is attached by one side only; the other side of the strainer being unsupported.

Also integral with the housing 13 is the cylindrical extension 14 that has on its outer end the lugs 15 which lugs register with similar lugs 16 of a casing 17 and these lugs have registering bolt holes and are secured together by the bolts 18.

The casing 17 can be of any desired shape or form to fit the air intake of a carbureter. The carbureter 19 in Fig. 1 is diagrammatically shown and can be of any standard make or form; also the carbureter 19 is connected to the engine manifold 20 in the usual way. As herein shown the connections consist of registering flanges 21 and 22 on the carbureter 19 and manifold 20 respectively and these flanges are secured together by the bolts 23.

The housing 13 has the end plate 25 secured to the face thereof by the screws 24, and this end plate has in its center the boss 26 in which boss is secured the ball bearing 27; and this ball bearing 27 is in alinement with a similar ball bearing 28 that is secured in a spider 29 on the opposite side of the housing 13. Within the ball bearings 27 and 28 is mounted the shaft 30, which shaft can be driven by any well known means; that is, it can be driven by the engine shaft by any usual connection; or it can be driven by the cam shaft, magneto shaft or fan shaft, which driving connections are well known and not shown in detail.

Attached to the shaft 30 is the fan 31 which has a plurality of wings 32; and this fan when rotated in the direction of the arrow in Fig. 2 causes a suction in the air cleaning receptacle to draw air into said receptacle; and sucks the air from the interior of the casing 9 and drives it through the cylinder 14 into the air intake of the carbureter.

Within the perforated casing 7 there is preferably mounted a wire screen 33 which screen has a flange extension 34 at one end thereof that normally abuts a flange extension 35 in the casing 9 and this screen is open at the flanged end. Over the screen 33 there is preferably mounted a cloth bag 36 that also has a flange extension 37 similar to the extension 34 of the wire screen 33. Over these flanges 34 and 37 there is placed the rubber gasket 39 which gasket and

flanges 34 and 37 are secured between the threaded end 38 of the perforated casing 7 and the flange 35 of the casting 9 by which connection these parts are held in place and also by which connection the casing 7 can be easily removed for cleaning the parts when dust has accumulated thereon.

As seen in the drawings, the smaller openings 40 taken collectively, have a much greater area than the opening through the cylinder 14 which opening 14 is substantially the diameter of the air inlet of the carbureter; and also it is preferred that the cloth 36 be a mesh that will produce small resistance to the air drawn therethrough, but which will be of a fineness sufficient to exclude dust that would wear or cut the engine cylinders. By this difference of area in the openings 40 and the opening through the cylinder 14 very small resistance will be offered to the fan in drawing the air through the cloth and discharging it through the cylinder 14 to the carbureter thereby eliminating excessive resistance or retarding effect on the pistons in the engine cylinders.

As previously stated the shaft 30 can be driven by the engine shaft and also rotated at a speed sufficient to supply the engine with clean air without depending upon suction.

A pipe 41 is provided for by-passing the clean air from the interior of the casting 9 directly to the engine manifold 20: and a valve 42 is interposed in the pipe 41 for controlling the flow of air through said pipe to the engine.

In operation the device is attached to the air inlet of the carbureter; and the shaft 30 is connected by some driving means to the engine shaft so that when the engine is put in operation the shaft 30 will be rotated to drive air into the carbureter in quantities to supply the engine cylinders; and as the air is drawn through the cloth 36 it will be cleaned of impurities and thereby eliminate the dust trouble in the engine. By mounting the strainer 1, as set forth above with one side only attached to the bracket 2, solid particles such as dust and the like will be shaken therefrom by the vibration of the engine and in this manner the engine will be rendered self-cleaning.

We claim:

1. An air cleaner for combustion engines, comprising an air filtering receptacle; and means adapted to be interposed between said receptacle and the air intake of an engine for drawing air into said receptacle by suction and then forcing the air from said receptacle into the intake of said engine.

2. In an air cleaner for combustion engines, having a perforated casing, a wire screen within said perforated casing, a cloth bag over said wire screen: a hollow casing; means whereby the wire screen and cloth bag are secured to said hollow casing: means adapted to form a connection between said hollow casing and a carbureter: and a fan in said hollow casing for sucking air through the perforated casing and cloth bag and discharging the air into the carbureter.

3. In an air cleaner for combustion engines, a screen enclosed receptacle, means adapted to form a connection between said screened receptacle and the air intake of an engine, a fan in said connection for drawing air into said screened receptacle and for discharging said air into the intake of said engine; and means for by-passing said cleaned air from said screened receptacle.

4. In an air cleaner for combustion engines, a screen enclosed receptacle, a connection to connect the screened receptacle to the air intake of an engine; a fan in said connection for drawing air into said screened receptacle and for discharging said air into said intake; a pipe adapted to extend from said screened receptacle to an engine; and a valve in said pipe.

In testimony whereof, we have hereunto set our hands at Los Angeles, California, this fifteenth day of July, 1919.

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