J. W. LIVERMORE.

AIR CLEANER.

APPLICATION FILED NOV. 17, 1919.

1,363,331. Patented Dec. 28, 1920.

Fig. 1

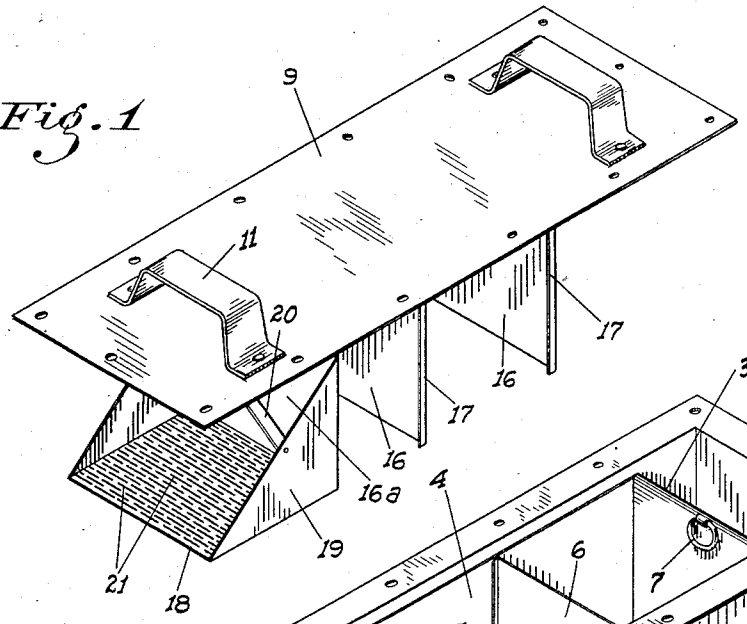


Fig. 2

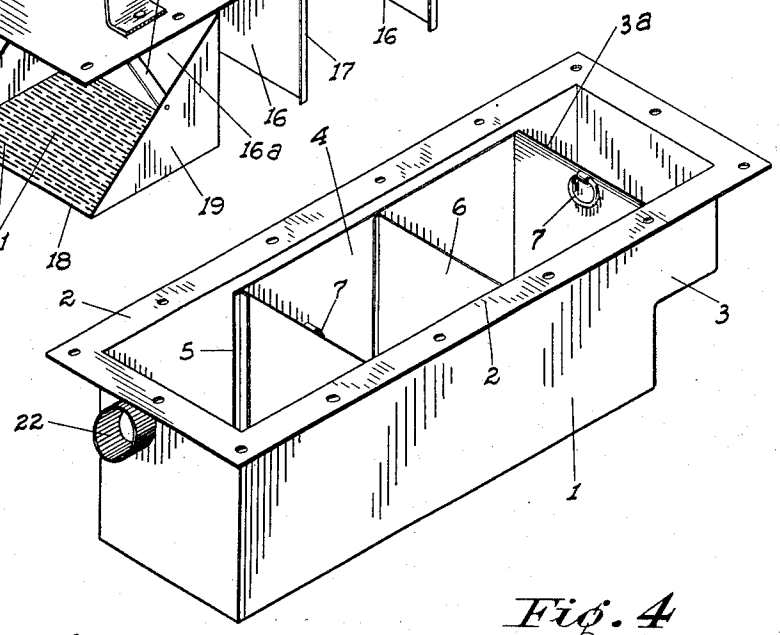


Fig. 3

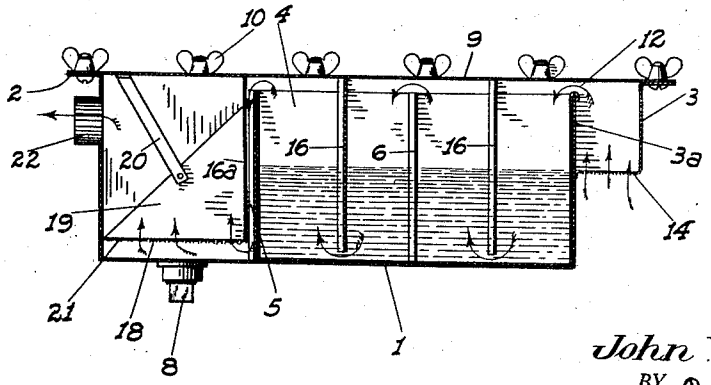
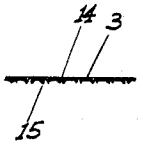


Fig. 4



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AIR-CLEANER.

1,363,331. Specification of Letters Patent. Patented Dec. 28, 1920.

Application filed November 17, 1919. Serial No. 338,505.

To all whom it may concern:

Be it known that I, JOHN W. LIVERMORE, a citizen of the United States, residing at Fresno, county of Fresno, State of California, have invented certain new and useful Improvements in Air-Cleaners; and I do declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this application.

This invention relates to improvements in air cleaners such as are used in connection with the carbureters of gas engines, particularly those employed on tractors and the like, to insure a clean supply of air to the carbureter.

The conditions under which tractors and similar farm machines work is such, especially in the dry summer months, that the air surrounding the machine is very apt to be full of dust, particles of straw, and other foreign matter, which, if drawn into the carbureter and thence into the engine in that condition, will in time cause serious trouble.

The principal object of my invention therefore, is to produce an air cleaner for the purpose so constructed that while the majority of foreign matter will be kept from entering the cleaner itself along with the air, what dirt etc. does get into the cleaner will be positively held therein, and the air will be drawn thence into the carbureter in a perfectly clean and washed state.

Another object of the invention is to construct a cleaner in such a simple manner that the interior may be readily inspected and the dirt, etc., removed therefrom when necessary without disconnecting the cleaner from the carbureter.

A further object of the invention is to produce a simple and inexpensive device, and yet one which will be exceedingly effective for the purposes for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views.

Figure 1 is a perspective view of the partitioned lid portion of my cleaner.

Fig. 2 is a similar view of the lower, or box portion thereof on which the lid fits.

Fig. 3 is a longitudinal section through the cleaner, showing the parts assembled in position.

Fig. 4 is an enlarged fragmentary section of the bottom of the air intake of the cleaner, showing the formation of the air slits therein.

Referring now more particularly to the characters of reference on the drawings, the numeral 1 denotes a rectangular box or receptacle, preferably of galvanized sheet metal, as are all the parts where possible.

The top of the box is provided with a continuous horizontal flange 2. At one end, which we may term the intake end of the box, is a relatively small compartment 3 extending transversely of the box, the dividing wall 3^a between the box and the compartment being lower than the level of the flange 2.

In this box is adapted to snugly fit an open topped tank 4, extending from the intake end to about two thirds of the length of the box, and being held in lengthwise position therein by means of guides 5 secured in the box.

The sides of this tank terminate short of the level of the flanges on the box, being of the same height as the wall 3^a. A partition 6 is positioned centrally in the tank transversely thereof, and is the same height thereas. Small ring handles 7 are fitted at each end of the tank, so that it may be readily removed by hand when desired.

A plug 8 is screwed into the bottom of the box beyond that portion occupied by the tank.

A flat cover 9 is adapted to be secured over the box onto the flanges 2 thereof by means of easily removable wing-nut screws 10, and being provided with handles 11 to allow of its being lifted off.

The bottom of the member 3 is provided with slits 14 throughout its area, these slits being punched from the interior outwardly as shown at 15, so that the metal projecting downwardly therefrom will effectively aid in holding back any large particles of foreign matter being sucked thereinto with the air.

Transverse partitions 16 depend from the cover 9, and terminate short of the bottom of the tank and box. Two of these partitions project centrally of the compartments of the tank, while the other one 16^a pro-

jects a short distance beyond the end of the tank. Flanges 17 on the side edges of the partitions 16 insure their fitting snugly against the sides of the tank. The partition 16ª is provided with a bottom 18 spaced from the bottom of the box and fitting closely over the entire area of that portion of the box beyond the said partition unoccupied by the tank 4. The bottom member 18 is provided with side members 19 secured to the partition 16ª and with braces 20 extending to the cover 9, to give strength and rigidity thereto. The bottom member 18 is provided with a plurality of very narrow slits 21 over its entire area, these being formed in the same manner as those in the bottom of the compartment 11.

A short tubular member 22 projects horizontally from the box at this end at a point adjacent its upper edge, and is adapted to fit over the air intake of a carbureter or into a hose leading to the same, communicating of course with the interior of the box 1 at that point.

In the installation and operation of the device, the box 1 is to be securely mounted on the engine at any suitable place, of course the closer to the carbureter the better, and so that the cover 9 may be lifted vertically therefrom without disturbing the box or any parts of the engine.

The tank is then filled about half full of kerosene, water or any similar liquid. I preferably specify kerosene, since this liquid has the effect of drying the air besides cleansing the same. If moist air is preferred, water may be used.

When the cover is secured in position, and the engine is operating, the air will be sucked from the outside first into the chamber 3. The slits 14, as stated, prevent any large particles of solid matter from entering the compartment. From that point the air is drawn into the first compartment of the tank, where it must pass through the liquid in order to pass under the partition 16, which is of course submerged.

The air then rises through the liquid, over the partition in the tank, and then through the liquid in the other compartment, to pass under the cover partition in that one. From this compartment the air then travels between the end of the tank and the partition 16ª, when it must then pass through the slits 21 in the bottom member 18 before it can reach the tube 22 communicating with the carbureter.

During its enforced passage through the liquid, the air is of course relieved of all heavy particles, while those which are relatively light will remain floating on the surface of the liquid.

Should any such particles be drawn from the liquid with the force of the air suction, they will be caught by the slits in the member 18, and the air will thus be delivered to the carbureter perfectly cleaned.

When the device needs cleaning, the cover is removed, the tank emptied and replenished, and any foreign matter then remaining in the box blown out through the plug hole 8.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfils the object of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as to not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention what I claim as new and useful and desire to secure by Letters Patent is:—

1. An air cleaner comprising an inclosed receptacle adapted at one end to communicate with the air intake of a carbureter, an air intake compartment outside the receptacle and communicating therewith at the top, and a plurality of narrow slits in the bottom of the intake compartment, these slits being punched outwardly from the interior to leave the metal edges thereof projecting downwardly to catch any relatively large particles of foreign matter in the air being drawn into the compartment.

2. An air cleaner comprising an inclosed receptacle adapted at one end to communicate wtih the air intake of a carbureter, a tank partially filled with liquid in the receptacle, an air intake communicating with the receptacle at the top of the end thereof opposite to its connection with the curbureter, and a plurality of vertical and transverse partitions secured to the tank and receptacle suitably spaced apart and alternately terminating short of the top of the box and the bottom of the tank respectively, the latter being always below the level of the liquid.

3. An air cleaner comprising an open topped box adapted to communicate with the air intake of a carbureter, an air intake compartment on said box at the end thereof opposite to its connection with the carbureter, and communicating with the box at the top of such end, a removable open topped tank in the box adapted to be partially filled with a liquid, a transverse central partition in the tank, a removable cover on the box, and transverse partitions on the cover projecting into the tank fitting snugly against the sides and terminating short of the bottom thereof, the tank likewise terminating short of the cover.

4. An air cleaner comprising an inclosed receptacle adapted at one end to communicate with the air intake of a carbureter, a

tank partially filled with liquid in the receptacle, an air intake communicating with the receptacle at the top of the end thereof opposite to its connection with the carbureter, and coöperating partitions in the receptacle and tank whereby the air will be forced to pass through the liquid in each compartment of the tank before being drawn into the carbureter.

5. An air cleaner comprising an inclosed receptacle adapted at one end to communicate with the air intake of a carbureter, a tank partially filled with liquid in the receptacle, an air intake communicating with the receptacle at the top of the end thereof opposite to its connection with the carbureter, means for forcing the air drawn through the intake to pass through the liquid a plurality of times, a horizontal slitted bottom partition in the receptacle beyond the tank through which the air from the tank must rise, the slits being punched through to the under side whereby projecting metal edges will be formed to catch any foreign matter still remaining in the air, said foreign matter falling to the floor of the receptacle when the suction ceases, and means for then removing such refuse without disturbing the receptacle.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN W. LIVERMORE.

Witnesses:
M. E. HINDLE,
GUSTAVE E. LUNDIE.