H. N. CROSS.

DUST FUEL CARBURETER.

APPLICATION FILED FEB. 12, 1919.

1,349,751.

Patented Aug. 17, 1920.

Fig. 1

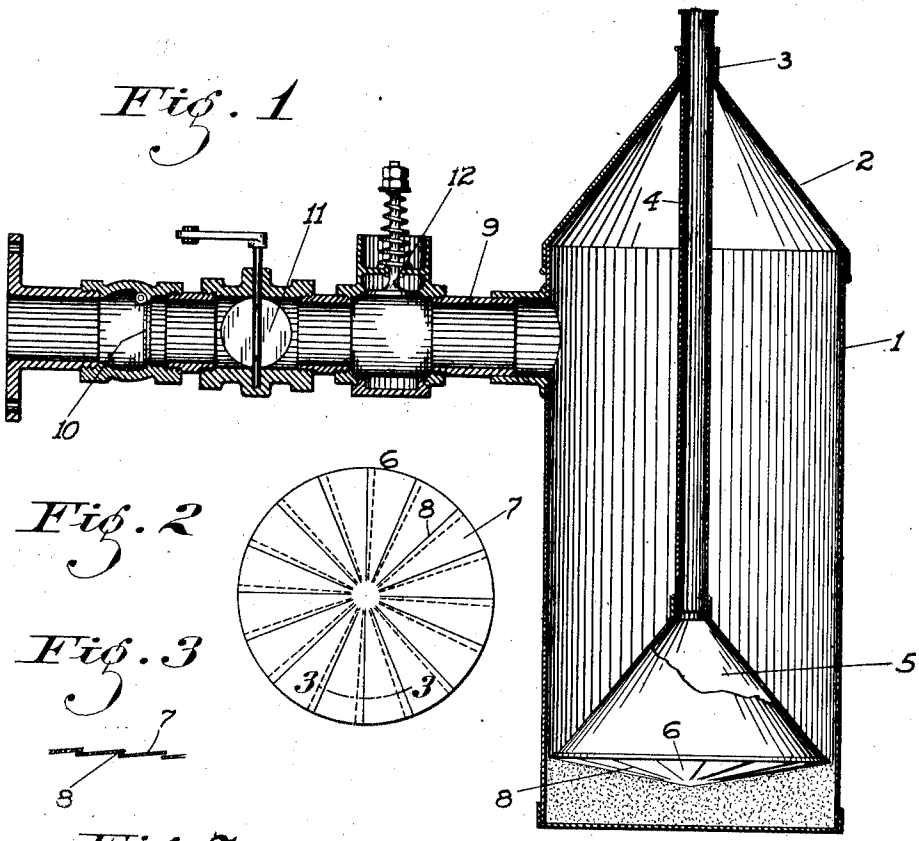


Fig. 2

Fig. 3

Fig. 7

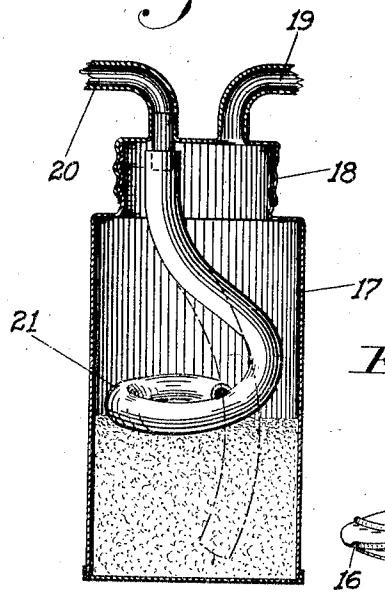


Fig. 4

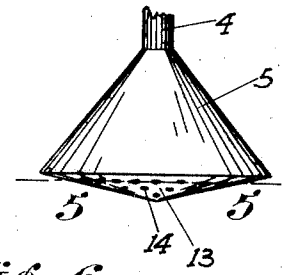


Fig. 5

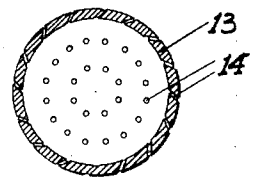
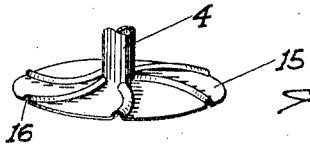


Fig. 6



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DUST-FUEL CARBURETER.

1,349,751. Specification of Letters Patent. Patented Aug. 17, 1920.

Application filed February 12, 1919. Serial No. 276,497.

To all whom it may concern:

Be it known that I, HARRY N. CROSS, a citizen of the United States of America, residing at Stockton, in the county of San Joaquin, State of California, have invented certain new and useful Improvements in Dust-Fuel Carbureters; and I do declare the following to be a clear, full, 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 dust fuel carbureters, the principal object of the invention being to produce a carbureter for carbonaceous dust fuel whereby this type of fuel may be successfully used for operating internal combustion engines, particularly those of the slow speed hot-bulb ignition type, such as the Diesel, Bolinder and similar designs.

A further object has been to provide a carbureter for utilizing this type of fuel which may be attached to and used on internal combustion engines without the necessity of any alterations therein.

As a further object still, I have produced a combined carbureter and fuel tank from which the same proportion of dust will be delivered to the engine during the intake or suction cycle thereof whether the carbureter is full of fuel or nearly empty.

As a fourth object, I have produced a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

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

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

Figure 1 is a cross-sectional view of the preferred form of my carbureter and attachments thereon.

Fig. 2 is a bottom plan view of a blast nozzle.

Fig. 3 is a fragmentary section taken on a line 3—3 of Fig. 2.

Fig. 4 is a fragmentary elevation of another form of nozzle.

Fig. 5 is a cross-section taken on a line 5—5 of Fig. 4.

Fig. 6 is a fragmentary elevation of still another form of nozzle.

Fig. 7 is a sectional view of a modified form of carbureter.

Referring now more particularly to the characters of reference on the drawings, particularly to Figs. 1, 2 and 3, thereon, the numeral 1 represents a body or container of any suitable size and substantially airtight, being fitted with a conical cover 2 in the top of which is a bushing or sleeve 3 forming a bearing for a hollow tube 4 slidable therein. This tube 3 is open to the air at its upper end, its lower end being secured to a nozzle 5 whose sides are conical to the same degree as the cover 2, and which is spaced somewhat from the sides of the container at its greatest diameter. The bottom 6 of this nozzle is formed in the shape of a flat inverted cone, and is built up of a number of overlapping plates 7 radiating from the center of the bottom, at which point and at the periphery thereof the plates are soldered or otherwise held together, but leaving air slits 8 between any two overlapping plates intermediate of the periphery and center, these slits of course being nearly horizontal.

Near the top of the container 1 a pipe 9 enters the side thereof adapted to be connected at its outer end to the intake manifold of any suitable internal combustion engine.

Such fittings as may be necessary for safety and control and adjustment of the charge of fuel drawn into the engine are interposed in the pipe, such as a check valve 10 to guard against back-firing, a butterfly valve 11 of the ordinary type, and an adjustable auxiliary air valve 12.

In the form of nozzle shown in Figs. 4 and 5, the bottom 13 is preferably a thin casting of aluminum or some other similarly light metal and is provided with a plurality of staggered rows of small perforations 14, these being drilled horizontally but at an angle to the axis of the member 13.

In the form shown in Fig. 6, the sloping sides are dispensed with, and a single disk 15 is attached to the tube 4, which disk is pressed to form spiral grooves 16 thereunder communicating with the tube 4. The principle of operation of the foregoing described types is as follows:

Supposing the container 1 to be full of

dust fuel, which may be to a point slightly lower than the pipe 9. The nozzle 5 and tube 3 then ride on top of the fuel. When the suction stroke of the engine is reached and the intake valves thereof opened, the suction through the pipe 9 tends to create a vacuum in the container 1, which tendency is relieved by a rush of air through the tube 1 and down into the nozzle 6. The outlets from the nozzle, such as the slits 8, perforations 14 and grooves 16, are all so positioned that the air is drawn from the nozzle in the form of a whirlwind, which action stirs the dust immediately adjacent these outlets and causes a portion of it to rise in a cloud in the container above the nozzle, from which it is drawn by the suction in the pipe 9.

By means of the auxiliary air valve 12, the amount of air drawn in with the dust may be regulated as is required. The dust not drawn into the pipe 9 finally settles and falls onto the sides of the nozzle and slides down the same, the somewhat steep slope preventing any tendency of the dust to finally bury the nozzle and render the same inoperative. As the fuel level is lowered, the nozzle and tube of course drop likewise, always remaining on top of the fuel. By utilizing this principle, it will be evident that the container 1 may be of a size to contain sufficient fuel for a long run without impairing the working of the carbureter.

In the type of carbureter shown in Fig. 7, the container 17 is provided with a cap 18 thereon which has an air pipe 19 therein and an engine connection pipe 20, which latter is attached to a flexible tube 21 inside the container, the tube being of sufficient length to reach to the bottom of the container, and always lies on top of the fuel.

With the suction of the engine such fuel as is adjacent the open end of the tube is drawn thereinto, including some air from the pipe 19.

Thus, from the foregoing description it will readily be seen that I have produced such a device as substantially fulfils the objects 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 do 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. A nozzle for dust fuel carbureters comprising a hollow cone adapted to rest on the fuel, the top of the cone having free communication with the atmosphere, and means in the bottom of the cone whereby when air is drawn through the same by the force of an exterior suction a cloud of fuel dust will be caused to arise thereabout.

2. A nozzle for dust fuel carbureters comprising a hollow cone adapted to rest on the fuel, the top of the cone having free communication with the atmosphere, and the bottom of the cone being formed of a plurality of and overlapping plates spaced slightly apart.

3. A carbureter for dust fuel for internal combustion engines comprising a container connected at its top to the intake manifold of the engine, a nozzle in the container adapted to lie on top of the fuel therein, and a tube open to the air attached to the nozzle and projecting from the container and slidable therein, the nozzle being provided with air outlets on the bottom thereof whereby the air drawn through the tube into the nozzle will cause a cloud of fuel dust to arise in the container above the nozzle.

4. In combination with an inclosed container adapted to carry a supply of dust fuel, a nozzle therein adapted to lie on top of the fuel, a tube open to the air attached to the nozzle and projecting through the top of the container and slidable therein, the nozzle being provided with air outlets on the bottom whereby when air is drawn through the tube into the nozzle a cloud of fuel dust will arise in the container, and means for preventing any dust subsequently settling from burying the nozzle.

5. A carbureter for dust fuels for internal combustion engines comprising an inclosed container to receive the fuel and adapted for connection to the intake manifold of the engine, and a nozzle in the container having communication with the atmosphere and adapted to lie on top of the fuel irrespective of the level thereof.

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

HARRY N. CROSS.

Witnesses:
FRANK H. CARTER.
BERNARD PRIVAT.