Aug. 5, 1930. T. J. MALO 1,772,011

DECARBONIZER FOR INTERNAL COMBUSTION ENGINES

Filed June 19, 1928

Fig. 1.

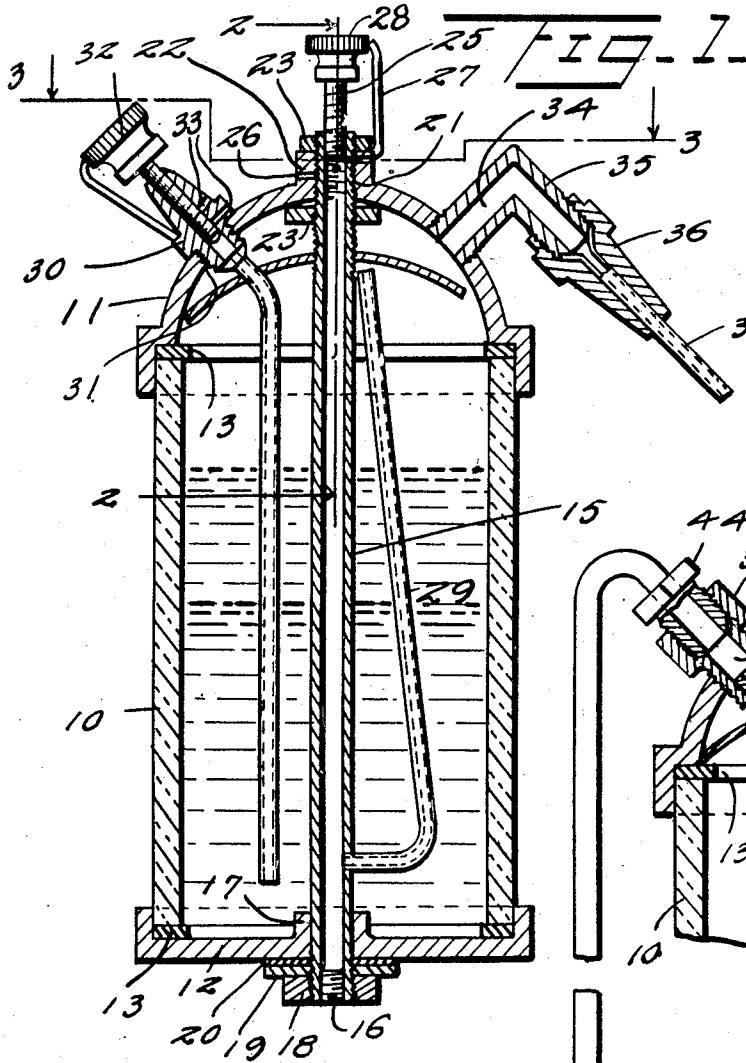


Fig. 2.

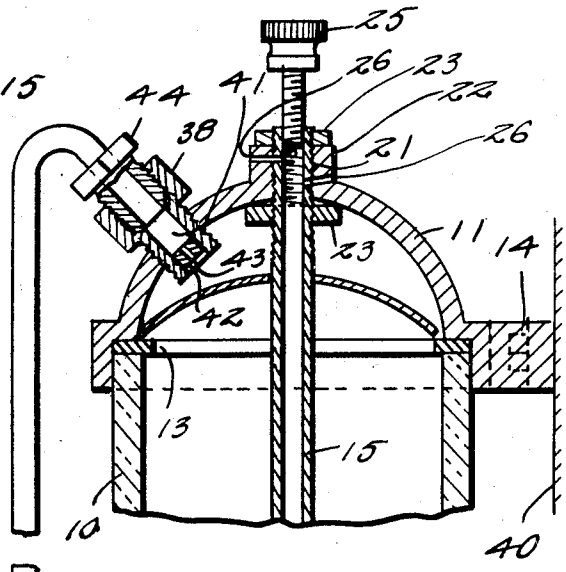
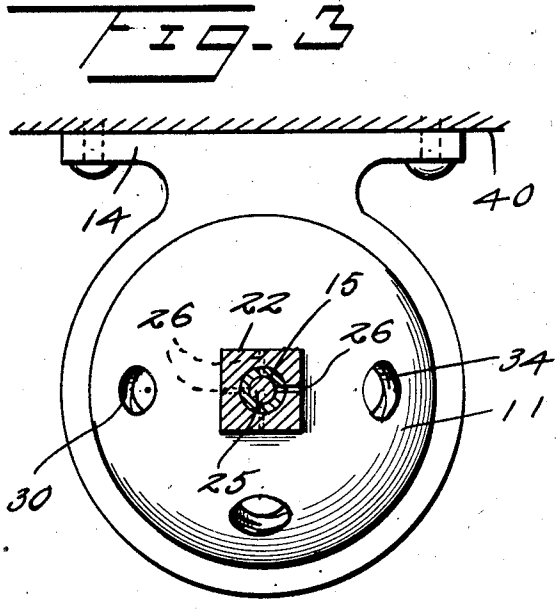
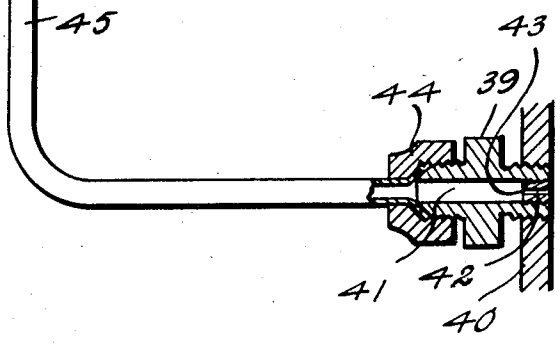


Fig. 3





Inventor

T. J. Malo

By Watson E. Coleman

Attorney

Patented Aug. 5, 1930 1,772,011

UNITED STATES PATENT OFFICE

THOMAS J. MALO, OF HAMMOND, INDIANA

DECARBONIZER FOR INTERNAL-COMBUSTION ENGINES

Application filed June 19, 1928. Serial No. 286,593.

This invention relates to a decarbonizer for internal combustion engines and more particularly to a device for supplying moistened air for use in the cylinders of the engine.

An important object of the invention is the provision in a device of this character of a construction permitting proportional mixture with moistened air or air which has not been moistened and of gases or vapors withdrawn from the crank-case of the engine.

A further object of the invention is to provide a device of this character which may be completely controlled in its operations to regulate the proportions of moistened and unmoistened air to the fumes or vapors withdrawn from the engine crank-case.

A still further object of the invention is to provide a construction permitting the use of a substance such as a penetrating oil in the moistening chamber which will add to the value of the mixture delivered to the cylinders as an explosive compound and which will assist in the removal of carbon deposits from the walls of the cylinders and valves of the engine.

A still further object of the invention is the provision of a device of this character which may be readily and cheaply produced, durable and efficient in service and a general improvement in the art.

These and other objects I attain by the construction shown in the accompanying drawing, wherein for the purpose of illustration is shown a preferred embodiment of my invention and wherein:—

Figure 1 is a vertical sectional view through a decarbonizer for internal combustion engines constructed in accordance with my invention;

Figure 2 is a view similar to that of Figure 1 and at right angles thereto;

Figure 3 is a section on the line 3—3 of Figure 1.

Referring now more particularly to the drawing, the numeral 10 designates a cylindrical and preferably transparent side wall which, at its ends, engages upper and lower caps 11 and 12 through gaskets 13. The upper cap preferably has means 14 whereby it may be secured to a support. Depending from the upper cap is a tubular connecting bar 15, the lower end of which is sealed, as at 16, and is directed through an opening 17 formed in the bottom cap 12. A nut 18 engaging the under surface of the bottom cap through a washer 19 and a gasket 20 serves both as a means for drawing the upper and lower cap against the gaskets 13 to seal the connection with the side wall 10 and to seal the connecting bar 15 at the point of its passage through the lower cap.

This connecting bar is preferably in the form of a piece of pipe plugged at its lower end and threaded at its upper end through an opening 21 formed in the upper cap and in a tubular boss 22 produced upon the latter at its center. Retaining nuts 23 lock the pipe in position and the interior of the pipe is threaded, as at 24, for the reception of a valve screw 25.

The boss and pipe are perforated at a plurality of points by minute ports 26 controlled by this valve and the boss has arising therefrom a spring finger 27 engaging the head 28 of the screw valve. The tubular connecting bar 15 has a vent 29 opening to the interior of the casing produced by the caps and cylindrical wall at the upper end thereof and below the level of liquids hereinafter to be described which are placed in this casing.

The upper cap 11 has further opening therethrough a port 30, the wall of which is interiorly threaded, as at 31, for the reception of a screw valve 32. This port is preferably in the form of an inserted valve body and has its wall perforated at a plurality of points, as indicated at 33, by minute ports which are controlled by the valve screw 32. This valve screw is held in adjusted positions in a manner similar to the valve screw 25. A further port 34 opens through the upper cap and is preferably provided by a bore of an L-fitting 35 screwed into the cap and provided at its outer end with a coupling 36 for connecting to the port a conduit 37 leading to the intake manifold of the engine, with which the device is employed.

The numerals 38 and 39 generally designate fittings directed through the upper cap 11 and the wall 40 of the crank case of the engine,

these fittings each having the bores 41 plugged, as indicated at 42, with a plug having a minute port 43 formed therein. Each fitting further has its outer end in the form of a coupling 44 to engage one end of a conduit 45 connecting the fittings. The upper cap may be likewise provided with a removable plug through which liquids may be introduced to the casing.

In use of the device, after its installation, it is partially filled with water and a light penetrating oil which is preferably characterized by the fact that it is readily miscible in water.

In the operation of the engine, it will be obvious that suction will be created in the upper end of the casing and by this suction, air will be drawn through the port 31 and vents 29 and vapors will be drawn from the base of the engine through the fittings 38 and 39. The port 31 has associated therewith a tube 45 by means of which air passing therethrough is discharged into the casing at the lower end thereof. It will, therefore, be obvious that a mixture of moistened air and unmoistened air and vapors drawn from the base of the engine will be drawn through the conduit 37 to the intake manifold. The proportions of these vapors to one another may be very closely regulated by adjustment of the valves 25 and 32, and it will be obvious, if sufficient air is admitted through these valves, the amount of vapors drawn from the base of the engine will be relatively low while, if the amount of air permitted to pass through these valves is reduced, the proportion of the amount of vapors will be increased. It will also be obvious that the proportionate amounts of moistened and unmoistened air may be closely regulated by regulation of the valves 25 and 32, with the result that a perfect balance of these elements is obtainable. The air which enters through the port 31 and tube 45, since it passes upwardly through the water and oil, will agitate the same so that after a short period of operation, these elements will be thoroughly mixed and air passing therethrough will contain moisture derived from both and a certain percentage of both. This air intermingling with the stream arising from the carbureter will serve to break up this air stream and any liquefied particles carried thereby and thoroughly intermingle therewith. The penetrating oil, when delivered to the cylinders, will act upon the carbon deposits therein to soften and loosen the same, so that they may be released by the shock of an explosion and discharged through the exhaust pipe.

It has been found in tests of apparatus of this character that when a proper balance of the mixture is obtained, the low speed control adjusting screw with which most carbureters are now supplied may be completely removed and a perfect idling operation obtained. It has also been found that with a properly regulated mixture, the combustion is so complete that the gases exhausted from the engine are substantially non-poisonous.

Since the construction hereinbefore set forth is capable of a certain range of change and modification without materially departing from the spirit of the invention, I do not limit myself to such specific structure except as hereinafter claimed.

I claim:—

1. In a decarbonizer for internal combustion engines, a casing adapted to contain a fluid to a predetermined level, a restricted port at the upper end of said casing and above said level, means for connecting said port with the interior of the crank-case of an engine, a second port communicating with the upper end of the casing above the level thereof, means for connecting the second port with the intake manifold of the engine, controllable means for admitting air to the casing above said level, and controllable means for admitting air to the casing below the level of the liquid therein.

2. In a decarbonizer for internal combustion engines, a casing comprising upper and lower heads, a tube connecting said heads and having its lower end plugged, a cylindrical side wall secured between said heads, said tube at its upper end provided with a plurality of ports, a port for the tube communicating with the interior of the casing adjacent the upper end thereof, a tube leading from the upper head of the casing to a point adjacent the lower end thereof, a valve for controlling said port, a port in the upper head adapted for connection with the intake manifold of the engine, and a second port in said upper head adapted for connection with the interior of the crank-case of the engine.

3. In a decarbonizer for internal combustion engines, a casing comprising upper and lower heads, a tube connecting said heads and having its lower end plugged, a cylindrical side wall secured between said heads, said tube at its upper end provided with a plurality of ports, a port for the tube communicating with the interior of the casing adjacent the upper end thereof, a tube leading from the upper head of the casing to a point adjacent the lower end thereof, a valve for controlling said port, a port in the upper head adapted for connection with the intake manifold of the engine, and a second port in said upper head adapted for connection with the interior of the crank-case of the engine, the last named port being restricted.

4. In a decarbonizer for internal combustion engines, a casing comprising upper and lower heads, a tube connecting said heads and having its lower end plugged, a cylindrical side wall secured between said heads, said tube at its upper end provided with a plurality of ports, a port for the tube com-

municating with the interior of the casing adjacent the upper end thereof, a tube leading from the upper head of the casing to a point adjacent the lower end thereof, a valve for controlling said port, a port in the upper head adapted for connection with the intake manifold of the engine, a second port in said upper head adapted for connection with the interior of the crank-case of the engine, and a liquid body within the casing having its upper level below the level of the port of the first named tube and above the lower end of the last named tube.

5. In a decarbonizer for internal combustion engines, a casing comprising upper and lower heads, a tube connecting said heads and having its lower end plugged, a cylindrical side wall secured between said heads, said tube at its upper end provided with a plurality of ports, a port for the tube communicating with the interior of the casing adjacent the upper end thereof, a tube leading from the upper head of the casing to a point adjacent the lower end thereof, a valve for controlling said port, a port in the upper head adapted for connection with the intake manifold of the engine, a second port in said upper head adapted for connection with the interior of the crank-case of the engine, and a liquid body within the casing having its upper level below the level of the port of the first named tube and above the lower end of the last named tube, said liquid body including water and a penetrating oil.

6. In a decarbonizer for internal combustion engines, a casing comprising upper and lower heads, a tube connecting said heads and having its lower end plugged, a cylindrical side wall secured between said heads, said tube at its upper end provided with a plurality of ports, a port for the tube communicating with the interior of the casing adjacent the upper end thereof, a tube leading from the upper head of the casing to a point adjacent the lower end thereof, a valve for controlling said port, a port in the upper head adapted for connection with the intake manifold of the engine, a second port in said upper head adapted for connection with the interior of the crank-case of the engine, and a liquid body within the casing having its upper level below the level of the port of the first named tube and above the lower end of the last named tube, said liquid body including water and a penetrating oil miscible in water.

In testimony whereof I hereunto affix my signature.

THOMAS J. MALO.