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M. E. CHANDLER ET AL

1,933,365

CARBURETOR AIR CONTROL

Filed Dec. 23, 1929

2 Sheets-Sheet 1

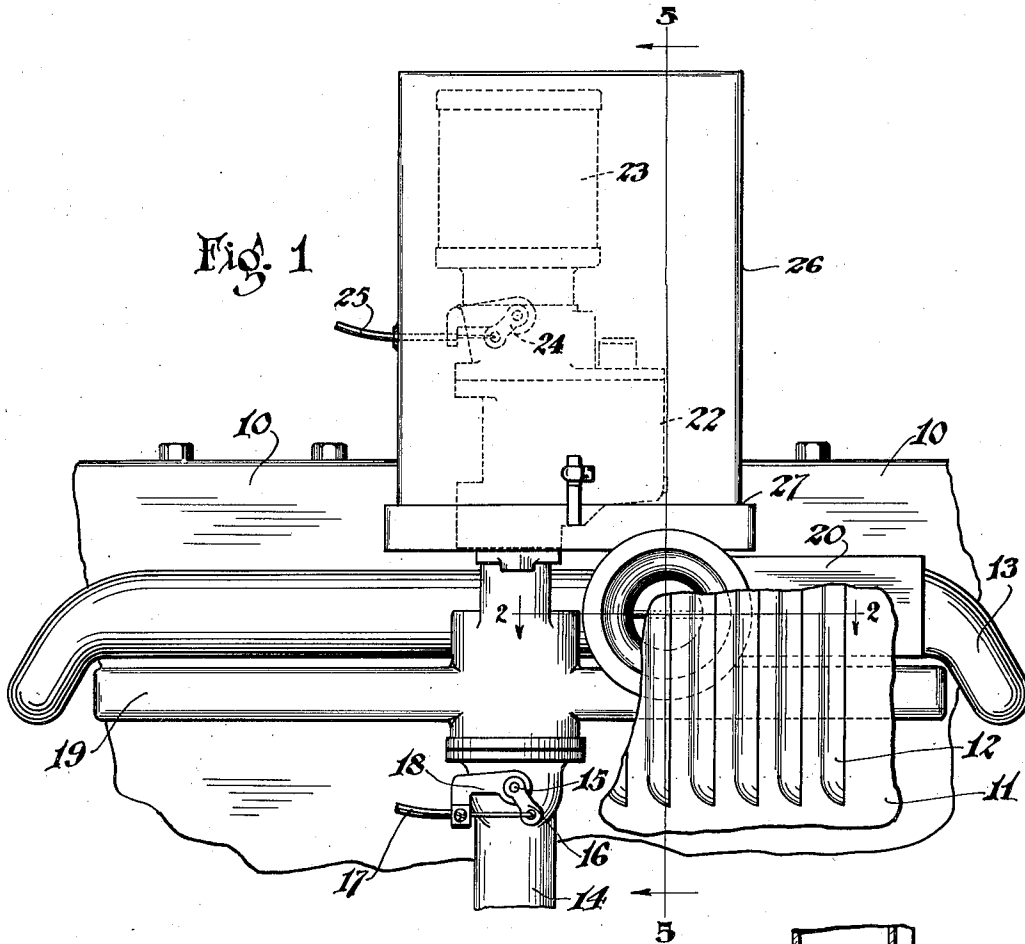
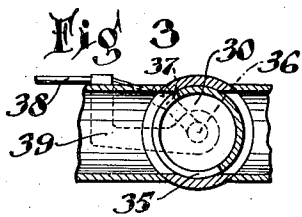
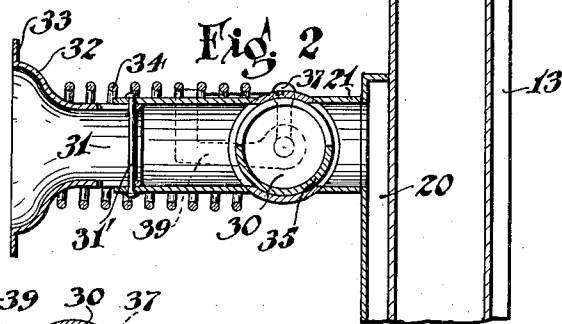
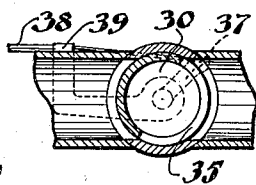


Fig. 4

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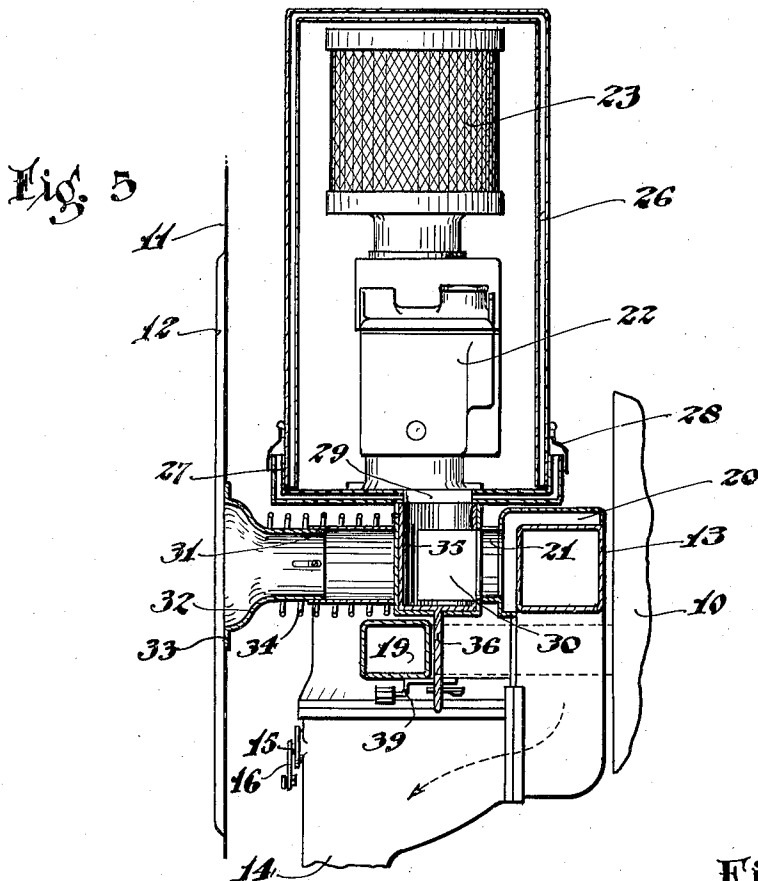
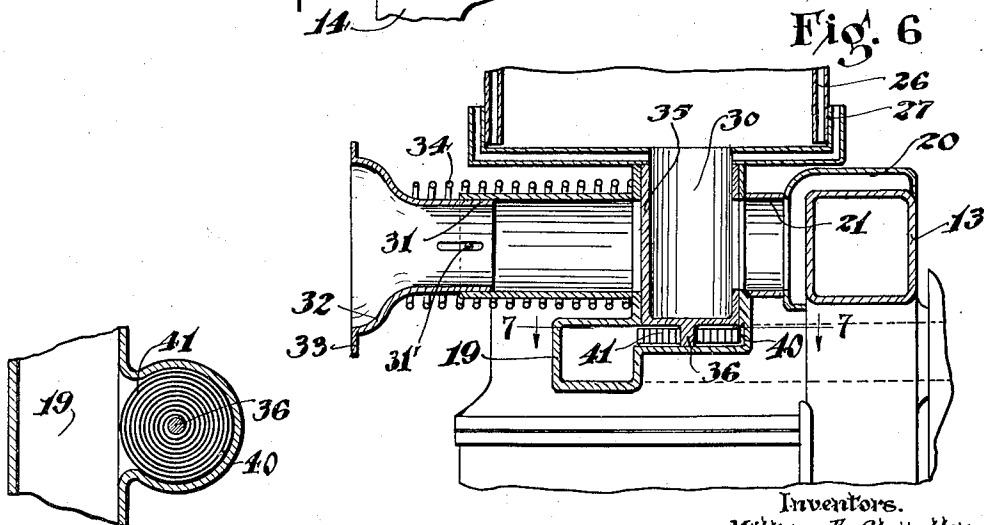
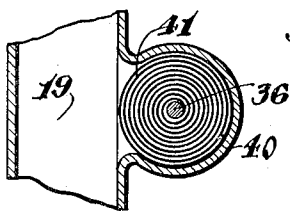
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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CARBURETOR AIR CONTROL

Milton E. Chandler and Don Cole, Chicago, Ill.,
assignors, by direct and mesne assignments,
of one-half to Bendix Stromberg Carburetor
Company, Chicago, Ill., a corporation of Illi-
nois, and one-half to Don Cole, Chicago, Ill.

Application December 23, 1929
Serial No. 416,117

18 Claims. (Cl. 123—122)

This invention relates to carburetors and more particularly has reference to the control of operating temperatures thereof.

It is well established that one of the most important factors in proper carburation for internal combustion engines is the control of the temperature at which the carburation is effected.

It is further well known that with the present quality of hydrocarbon fuel, heat to a greater or less extent, must be applied to the fuel and air mixture before the same can be efficiently utilized in the present types of internal combustion engines.

It is further well known that the power of a motor with correct carburation varies as the density of the air in the mixture and that the air density in turn varies with its absolute temperature. It has been determined that an increase of 50° Fahrenheit in air temperature will result in a loss of 10% in engine power. It is probably largely due to this fact that a down-draft carburetor gives increased engine power over an up-draft type, as the air admitted is materially cooler than in the up-draft type, on account of the fact that the down-draft carburetor is located in a cooler part of the space under the engine hood.

As too low air temperatures prevent proper vaporization of the hydrocarbon fuel and too high air temperatures result in loss of engine power, it is highly desirable that the air mixture be kept at as uniform and moderate a temperature as possible.

In the ordinary type of motor vehicle, the air taken into the carburetor is drawn from inside the hood and is consequently heated by entering through the radiator and by contact with the engine surfaces. Thus in warm weather with an atmospheric temperature of 90° Fahrenheit a temperature of approximately 150° Fahrenheit is customarily obtained under the hood. Moreover, carburetors of the conventional up-draft type and to a lesser extent the later improved down-draft types have necessarily to be located closely adjacent the exhaust manifold so that in addition to the heated air generally present under the hood, the carburetor receives an undesired quantity of heat by direct conduction and radiation from the engine manifold and while this heat may be utilized for cold weather operation, it adds greatly to the difficulties of securing correct carburation and maximum engine power during warm weather.

We are aware that previous attempts have been made to maintain a mixture of maximum power at

all temperatures by applying heat to the carburetor through the medium of the intake air during cold weather and reducing the temperature of the intake air in hot weather by admitting same from a source outside the engine hood, but these expedients have only been partially successful because of the fact that they do not solve the problem of the excessive heating of the carburetor from its location under the hood and adjacent the exhaust manifold.

It is the aim of the present invention to provide means for regulating and controlling the operating temperature in a carburetor (particularly of the down-draft type) by: (1) insulating the carburetor from the heated air under the hood and the direct radiation from the exhaust manifold and engine surfaces by enclosing the carburetor, and preferably the air cleaner also, in a heat insulated chamber, and (2) providing means for optionally admitting air to the carburetor from a source of heat (stove around exhaust manifold) or from a relatively cool source (the atmospheric air outside the engine hood).

An object of this invention is to control the operating temperatures of a carburetor.

Another object of the invention is to provide means for insulating the carburetor against the infiltration of heat from the heated air under the hood.

Another object of the invention is to provide means for controlling the temperature of air admitted to a carburetor.

Another object of the invention is to provide means for admitting to a carburetor either heated air under the hood or air at atmospheric temperature outside the hood or a mixture of the two depending upon relative temperatures of the same.

Another object of the invention is to provide a heat insulated chamber or casing for a carburetor and means connected therewith for controlling the temperature of the air admitted to the casing.

A further object of the invention is to provide an insulated jacket or casing for a carburetor, so that the carburetor will not be affected by the temperature of the surrounding atmosphere and means connected therewith for controlling the temperature of air admitted to the casing.

A further object of the invention is to provide an insulated jacket or casing for a carburetor having means for admitting air thereto including a valve connected to hot and cold air passages.

A further object of the invention is to provide an insulated jacket or casing for a carburetor provided with a valve connected to an air heater or stove and to a telescopic member adapted to receive air at atmospheric temperature.

Yet a further object of the invention is to jacket or encase a carburetor for an internal combustion engine and to insulate the casing, so that the carburetor will not be affected by heat radiating from the engine and to provide means for controlling the temperature of air admitted to the casing including a telescopic tube adapted to engage the hood of the engine with pressure and to receive air at atmospheric temperature through an opening in the hood.

Other objects of the invention will appear from the following description taken in connection with the drawings, which form a part of this specification, and in which:

Figure 1 is a side elevation of an internal combustion engine having a carburetor connected thereto enclosed in a casing or jacket and means associated therewith for admitting air to the casing;

Figure 2 is an enlarged sectional view along line 2—2 of Figure 1 illustrating the control valve in one position;

Figure 3 is a similar fragmentary view illustrating the valve in another position;

Figure 4 is a fragmentary view illustrating the valve in still another position;

Figure 5 is a vertical sectional view on line 5—5, Figure 1;

Figure 6 is a vertical sectional view illustrating a modified form of the valve controlling means; and

Figure 7 is a sectional view along line 7—7 of Figure 6 illustrating a thermostat for controlling the valve.

Referring to the drawings for more specific details of the invention, 10 represents an internal combustion engine and 11 a hood for covering the engine provided with louvers or openings 12. The engine has an exhaust manifold 13 provided with an exhaust outlet 14 in which is positioned a valve 15, operated through a lever 16 to which is attached a Bowden wire 17 supported by a suitable bracket 18. The engine is also provided with the conventional intake manifold 19.

The exhaust manifold has associated therewith an air heater 20 provided with a lateral sleeve or collar 21 and positioned on the intake manifold and communicating therewith is a carburetor 22 of the down-draft type having connected therewith an air cleaner 23, which may be of any preferred structure. The carburetor has a choke valve 24 operated through a Bowden wire 25.

As shown, the carburetor and the air cleaner are enclosed in a heat insulating jacket or casing 26 preferably formed in two parts, one fitted snugly in the other as indicated at 27 and detachably secured together by suitable fastening means 28. The space between the inner and outer walls of jacket 26 may be filled with a material of low heat conductivity to increase the heat insulating qualities of the jacket 26. Air is admitted to the interior of casing 26 through an inlet port 29, having communication with a chamber 30 connected to the sleeve of collar 21 on the hot air heater 20.

The chamber 30 has connected thereto a telescopic sleeve 31 provided with a flared end portion 32 having a flange 33 adapted to bear against the hood 11 immediately adjacent the louvers 12.

This telescopic sleeve has wound thereon between the flared portion 32 and the chamber 30 a helical spring 34. The spring 34 tends to extend the telescopic sleeve and to cause the flange on the flared end portion to engage and constantly bear against the hood with sufficient pressure to prevent rattling. To prevent the disengagement of sleeve 31 from chamber 30 when the hood is raised, there is provided a small bolt 31' slidably mounted in registering slots in the walls of the chamber 30 and sleeve 31. It is also to be observed that the relation of the sleeve to the louvers in the hood is such that air is admitted to the sleeve, but is not forced therein by the stream line flow thereof.

Positioned for rotation in the chamber 30 is a valve 35 having a stem 36 to which is secured a lever 37, operated through a Bowden wire 38 for controlling the valve, the wire being supported by a suitable bracket 39. Air is admitted to the casing 26 through the valve 35 either from the air heater 20 of the exhaust manifold 13 or through the telescopic sleeve 31 leading to the louvers in the hood for taking air from the outside atmosphere.

The manner in which the air is taken is determined by the valve. When the valve is in one position, all of the air is taken from the heater and when the valve is in the extreme other position, the air is taken from outside of the hood. It is, of course, to be understood that in intermediate positions of the valve, part of the air supplying may come from the heater and part from outside of the hood.

Figures 6 and 7 illustrate a modified form of the means for operating the valve 35. In this modification the intake manifold has communicating therewith a chamber 40 in which is positioned a thermostat 41. As shown, the thermostat is of a spiral type having one end secured to the wall of the chamber 40 and its other end secured to the stem 36 of the valve 35. It will be observed that in this structure the air control valve 35 is operated by a thermostat affected by the temperature changes in the intake manifold.

While we have shown and described the heat insulated casing as completely enveloping the carburetor and air cleaner, it is obvious that various other arrangements may be made without departing from the spirit of this invention and the scope of the appended claims. Thus, for example, the heat insulated casing might cover only the carburetor per se with the air cleaner outside, although it is believed to be more efficient to locate the air cleaner inside the casing as shown and described.

While preferred embodiments of the invention have been described, it is to be understood that these are given merely as examples of the underlying principles of the invention and since these may be incorporated in other specific mechanical structures, we do not intend to be limited to those shown except as such limitations are clearly imposed by the appended claims.

We claim:

1. A carburetor provided with a heat insulated jacket completely enveloping same in spaced relation thereto and having a plurality of selectively controlled air inlets.

2. A double wall heat insulated casing completely enclosing a carburetor and forming an air passage thereto.

3. A heat insulated jacket for enclosing a carburetor including means for admitting temperature regulated air successively to the jacket and to the carburetor.

4. In a carburetor, a heat insulated jacket forming an air conduit, the walls of which are spaced apart from and completely enclosing said carburetor.
- 5 5. A heat insulated jacket for enclosing a carburetor and means for admitting temperature regulated air thereto including hot and cold air inlet passages and a valve controlling said passages.
- 10 6. A carburetor having an air cleaner connected thereto, a heat insulated casing enclosing the carburetor and air cleaner, and means for admitting temperature regulated air to the casing, including hot and cold air inlet passages and a valve controlling said passages.
- 15 7. A heat insulated jacket for a carburetor and means for admitting temperature regulated air thereto, including a temperature controlled valve for controlling the admission of hot and cold air.
- 20 8. In a carburetor, a heat insulated casing enclosing the carburetor, a valve controlling the admission of air to the casing, hot and cold air inlet passages connected to said valve, and a thermostat for operating the valve.
- 25 9. In a carburetor, a heat insulated casing enclosing the carburetor, a valve controlling admission of air to the casing and carburetor, a plurality of air passages connected to said valve, and an air heater in one of said air passages.
- 30 10. The method of controlling and regulating the operating temperature of a carburetor which consists in completely insulating the carburetor from its immediate surroundings and conducting temperature regulated air from a remote point to said carburetor.
- 35 11. In a carburetor, a heat insulated casing enclosing the carburetor, a valve controlling the admission of air to said casing, a thermostat for operating said valve, an air heater connected to said valve and an independent cold air sleeve connected to the valve.
- 40 12. In a motor vehicle having an internal combustion engine enclosed in a hood, a carburetor connected to said engine, a heat insulated casing enclosing said carburetor and means to optionally or simultaneously admit air to said carburetor from within or without said hood.
- 45 13. In a motor vehicle having an internal combustion engine enclosed within a hood provided with air louvers, a carburetor for said engine, an insulated casing enclosing said carburetor and an air passage connected to said casing terminating in a telescopic sleeve yieldingly held against said louvers.
- 80 14. In combination with an internal combustion engine, a hood for covering the engine, louvers in the hood, a carburetor connected to the engine of an insulated casing enclosing the carburetor, means for admitting air to the casing including a valve, means for operating the valve including a thermostat positioned in the intake manifold of the engine, an air heater positioned on the exhaust manifold of the engine and connected to the valve, a telescopic sleeve connected to the valve and means for extending the sleeve to engage the hood immediately adjacent the louvers.
- 85 15. A method of controlling and regulating the operating temperature of a carburetor, comprising insulating the carburetor, causing the air supplied to the carburetor to first pass around the outside of the carburetor, and controlling the temperature of said air in accordance with the temperature of the mixture produced by the carburetor.
- 90 16. A method of controlling the operating temperature of a carburetor, comprising insulating the carburetor, modifying the temperature of a stream of air in accordance with the temperature of the mixture produced by the carburetor, passing the air so modified into heat exchanging relation to the carburetor, and then supplying the air to the interior of the carburetor.
- 95 17. In combination with an internal combustion motor having an exhaust manifold, a carburetor positioned above the exhaust manifold, and a heat insulating jacket surrounding the carburetor.
- 100 18. In combination with an internal combustion motor having an exhaust manifold, a downdraft carburetor associated with said motor and extending above the exhaust manifold, a heat insulating jacket surrounding the carburetor and spaced therefrom, and means for admitting air thereto including hot and cold air inlets and means controlling said inlets.
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