

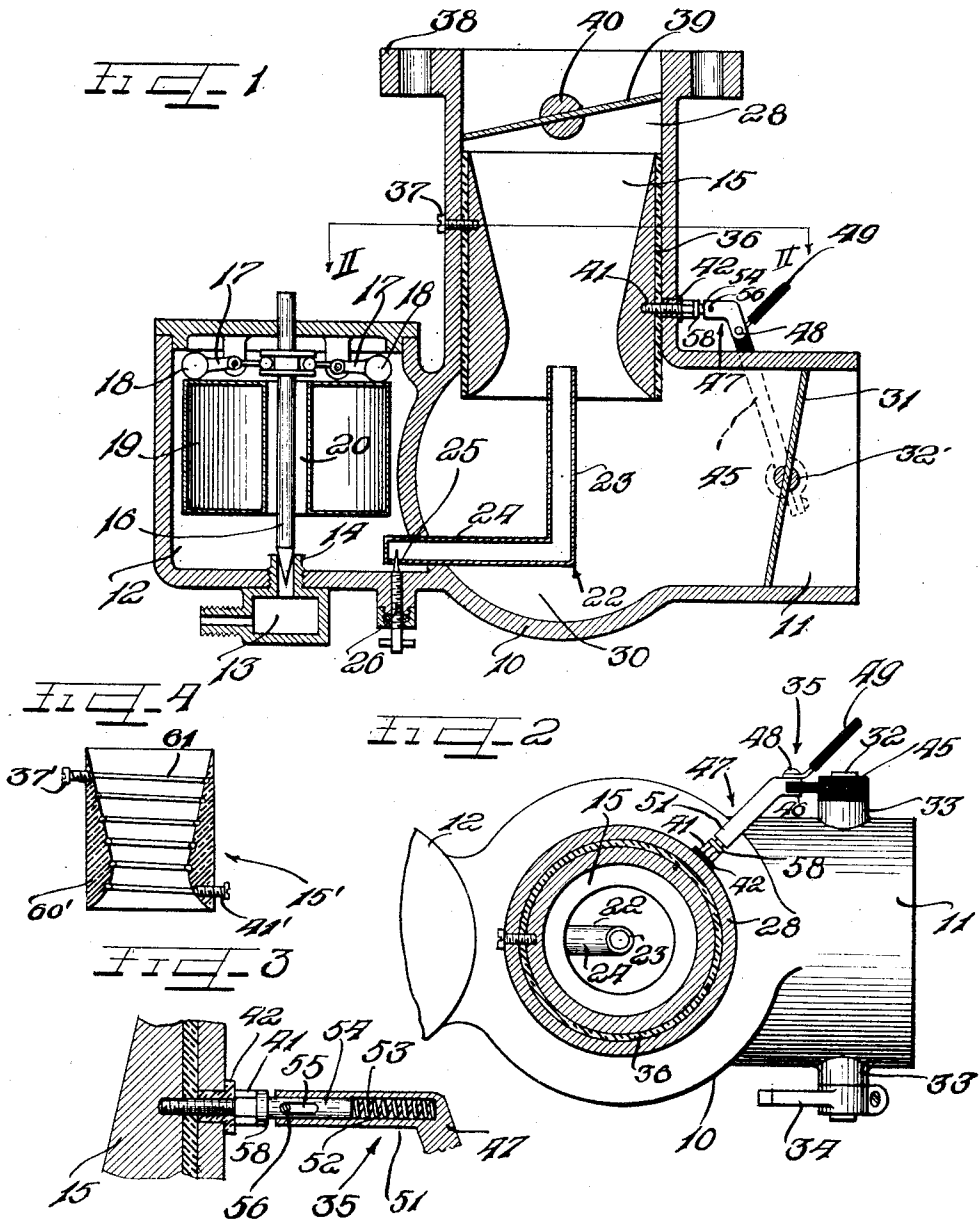
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CARBURETOR

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CARBURETOR

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Our invention relates to carburetors of the type employed on motor vehicles and more particularly to mechanism controlled by the choke valve for heating the fuel sprayed into the main air passage.

In order to augment the vaporization of the fuel sprayed into the main air passage of the carburetor, we find it desirable, especially in cold weather when the vehicle is being started, to preheat this passage. In order to accomplish this desirable end, we have devised a switch construction controlled by the choke valve of the carburetor and adapted to automatically close an electric circuit arranged to preheat the main air passage, when the choke valve is in its closed position. This construction is such that when the choke valve is open, the switch is open and when the choke valve is closed, the switch is automatically closed.

Our novel preheating mechanism is especially useful in the starting of the motor and by its use we find that the engine may be set into normal operation in much less time than heretofore.

In accordance with the features of the preferred form of our invention, we provide the main air passage of the carburetor with a Venturi nozzle equipped with an electrical resistance for preheating the passage. The resistance comprises part of an electrical circuit controlled by a switch disposed on the exterior of the carburetor; the switch being connected directly to the pivot of the choke valve.

Other objects and advantages of our invention will more fully appear from the following detailed description taken in connection with the accompanying drawing which illustrates several embodiments thereof and in which:

Figure 1 is a vertical sectional view taken through a carburetor embodying the features of our present invention;

Figure 2 is a sectional view taken on substantially the line II—II of Figure 1, looking downwardly;

Figure 3 is an enlarged detail sectional view of our novel switch construction used

to control the resistance in the Venturi nozzle; and

Figure 4 is a vertical sectional view through a modified form of nozzle built in accordance with the features of our invention.

As shown on the drawings:

The carburetor shown in Figure 1 is substantially like the conventional type of carburetor, with the exception that the Venturi nozzle 15 shown therein is provided with preheating means to be described more in detail hereinafter. The carburetor comprises a body 10 including an inlet air passage 11 and a float chamber 12. Connected to the float chamber 12 is a fuel supply or gasoline line 13 which is suitably connected to the tank (not shown) of the vehicle. The fuel line 13 has a lateral tubular extension 14 threaded into the body defining the float chamber 12. A needle valve 16 extends into the tubular member 14 and is adapted to control the supply of fuel delivered to the float chamber in a well known manner. The upper end of valve member 16 is carried by a pair of pivotally mounted lever members 17 which members have enlarged ends 18 resting on top of the float 19. The rod 16 extends upwardly through an opening 20 in float 19. It will be evident from this illustration that the rise and fall of float 19 controls the amount of fuel discharged into the chamber 12 from the source of supply.

Positioned within the body 10 is a right angle pipe or tube member 22, the vertical leg 23 of which extends upwardly toward the nozzle 15. A horizontal leg 24 of the tube 22 extends into the float chamber 12 and has a small opening 25 through which fuel from the float chamber is delivered to the tube. This opening 25 is controlled by a conventional needle valve member 26 threaded into the body 10 in a well known manner.

The major part of the tube 22 is disposed in the junction between the inlet air passage 11 and the main air passage 28 in which is disposed the Venturi nozzle 15. This junction is designated by the reference character 30. Also it will be noted from Figure 1 that the upper end of the leg 23 of tube 22 extends a slight ways into the Venturi nozzle 15.

The inlet air passage 11 is controlled by a choke valve 31 formed integral with a pivot member 32 journaled at its ends in diametrically opposed bosses 33 formed integral with the body 10. One end of pivot member 32 is connected to a lever 34 used to operate the choke valve. The other end of the member 32 is connected to a switch construction 35 which will be described more in detail as the present description progresses.

The Venturi nozzle 15 is preferably made of a material such as a metal having the inherent quality of offering a relatively high resistance to the flow of an electrical current. Also the Venturi nozzle 15 comprises a conductor which is insulated from the portion of the body 10 defining the passageway 28 by a sleeve of insulation 36. The upper end of nozzle 15 is grounded thru the body 10 by means of a small screw 37 threaded through the wall of tube 28, the sleeve 36 and into nozzle 15.

The upper end of passageway 28 is provided with an annular flange 38 by means of which the carburetor may be secured to the intake manifold (not shown) of the engine. Furthermore, disposed in the upper end of the passageway 28 is a throttle valve 39 having formed integral therewith a pivotally mounted rod 40 which may be operated in any usual manner.

The lower end of nozzle 15 is held in place by means of a stud or screw 41 extending through the wall of passage 28, the sleeve 36 and threaded into nozzle 15. This stud 41 is insulated from the body 10 by means of a small bushing 42. The two studs 37 and 41 cooperate to connect an electrical circuit to the conductor or nozzle 15 and also function to anchor the nozzle to the body 10. We shall now proceed to describe in detail the switch construction 35.

Suitably fastened to one end of the choke valve pivot member 32 is an upwardly extending arm 45 made of any suitable insulation. The upper end of this arm 45 fits in a socket 46 formed integral with one end of an angular switch member 47. The upper end of arm 45 is secured in the socket 46 by means of a small bolt 48. Also it will be noted that the bolt 48 is used to fasten one end of the electrical conductor 49 to the member 47. The other end of this conductor 49 may be connected directly to the battery (not shown) of the vehicle.

The leg 51 of member 47 is provided with a cylindrical bore 52 in which is disposed a compression spring 53. Also disposed in the bore 52 is a plunger 54 having a slot 55. A pin 56 extends through slot 55 and is anchored at its ends in the leg 51 of member 47. The function of pin 56 is to limit the movement of the plunger 54 under the urging effect of the spring 53. The external end of the plunger 54 is provided with an enlarged

head 58 adapted to abut the head of stud 41 as shown in Figure 3. Obviously when the head 58 is in contact with the head of stud 41, the electrical conductor 49 will be connected to the nozzle 15 and the current delivered to the nozzle 15 will travel circumferentially about it to the stud 37 which is grounded.

The operation of our mechanism is believed to be evident from the above detail description. When the cold engine is being initially started, it is customary to close off the supply of air to the carburetor by shutting the choke valve 31. By the closing of valve 31 the member 47 is moved toward the passageway 28 to bring the plunger 54 into electrical contact with the stud 41. The head of stud 41 and the head 58 of plunger 54 in reality constitute a pair of electrical contacts. Due to the resilient mounting provided for plunger 54, it will be resiliently urged into contact with the head of stud 41, thus insuring a good electrical connection.

Now when this electrical connection is established, the nozzle 15 will function as a conductor in the circuit of the vehicle. Moreover, since the nozzle 15 is made of a material having a relatively high resistance to the flow of an electrical current therethrough, it will become heated by the current flowing from stud 41 to stud 37, which latter stud is grounded. The heated nozzle 15 will in turn preheat the fuel sprayed into the nozzle from the vertical leg 23 of tube 22. This preheating of the fuel will augment the vaporizing of the fuel and will facilitate the starting of the engine.

As soon as the engine is warmed up, the choke valve 31 is moved to its open position and the conductor 49 is automatically disconnected from the nozzle 15.

In Figure 4 we have illustrated a modified form of Venturi nozzle 15' comprising a cylinder of refractory material 16 having embedded in its inner surface a spiral resistance wire 61 connected to studs 41' and 37'; the stud 41' being connectable to the switch mechanism of our invention and the stud 37' being adapted to be grounded. The wire 61 is made of a material having a high resistance. The operation of this type of nozzle is substantially like the nozzle 15 and it is therefore thought that no further description of it is needed.

It will be apparent that our novel Venturi nozzle may be introduced into the main passageway of any conventional type of carburetor with facility, by merely disconnecting the main passageway from the manifold and by removing the throttle valve 39. This construction not only enables us to apply our invention to carburetors already in use in automobiles, but enables us to readily replace the nozzle should it become damaged in use.

Now we desire it understood that although

we have illustrated and described in detail the preferred forms of our invention, the invention is not to be thus limited, but only in so far as defined by the scope and spirit of the appended claims.

We claim:

1. In carburetion apparatus a mixing chamber for air and fuel, a nozzle disposed in said chamber, means for spraying a jet of fuel into said nozzle, an air passageway connected to said chamber and nozzle, a choke valve disposed in said passageway, an insulated electrical contact member connected to said choke valve and movable therewith, an electrical conductor connected to said contact member, a resiliently mounted contact carried by said contact member, an external fixed contact connected to said nozzle cooperable with said resilient contact, said conductor comprising a part of a grounded electrical circuit, a grounded connection secured to said nozzle and means for operating said choke valve to move said resilient contact into and out of cooperation with said fixed contact.

2. In carburetion apparatus, a mixing chamber, a nozzle in said chamber, means for spraying a jet of fuel into said nozzle, an air passageway connected to said chamber and nozzle, a choke valve in said passageway for controlling the flow of air therethrough, a contact member connected to and insulated from said choke valve, an electrical circuit connected to said member, a resilient contact carried by said member and an external fixed contact connected to said nozzle and cooperable with said resilient contact, said contact member being movable into and out of cooperation with said fixed contact by movement of said choke valve.

3. In carburetion apparatus, a mixing chamber, a nozzle in said chamber, means for spraying a jet of fuel into said nozzle, an air passageway connected to said chamber and nozzle, a choke valve in said passageway for controlling the flow of air therethrough, a contact member connected to and insulated from said choke valve, an electrical circuit connected to said member, a resilient contact carried by said member and an external fixed contact connected to said nozzle and cooperable with said resilient contact, said contact member being movable into and out of cooperation with said fixed contact by movement of said choke valve, said nozzle comprising a conductor of relatively high resistance connected at one end to said fixed contact and having its other end grounded.

In testimony whereof, we have hereunto subscribed our names.

ROBERT HAMILTON.
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