Mar. 20, 1923.

1,448,863.

B. N. PIERCE.

CARBURETOR.

ORIGINAL FILED MAR. 2, 1917.

2 SHEETS—SHEET 1.

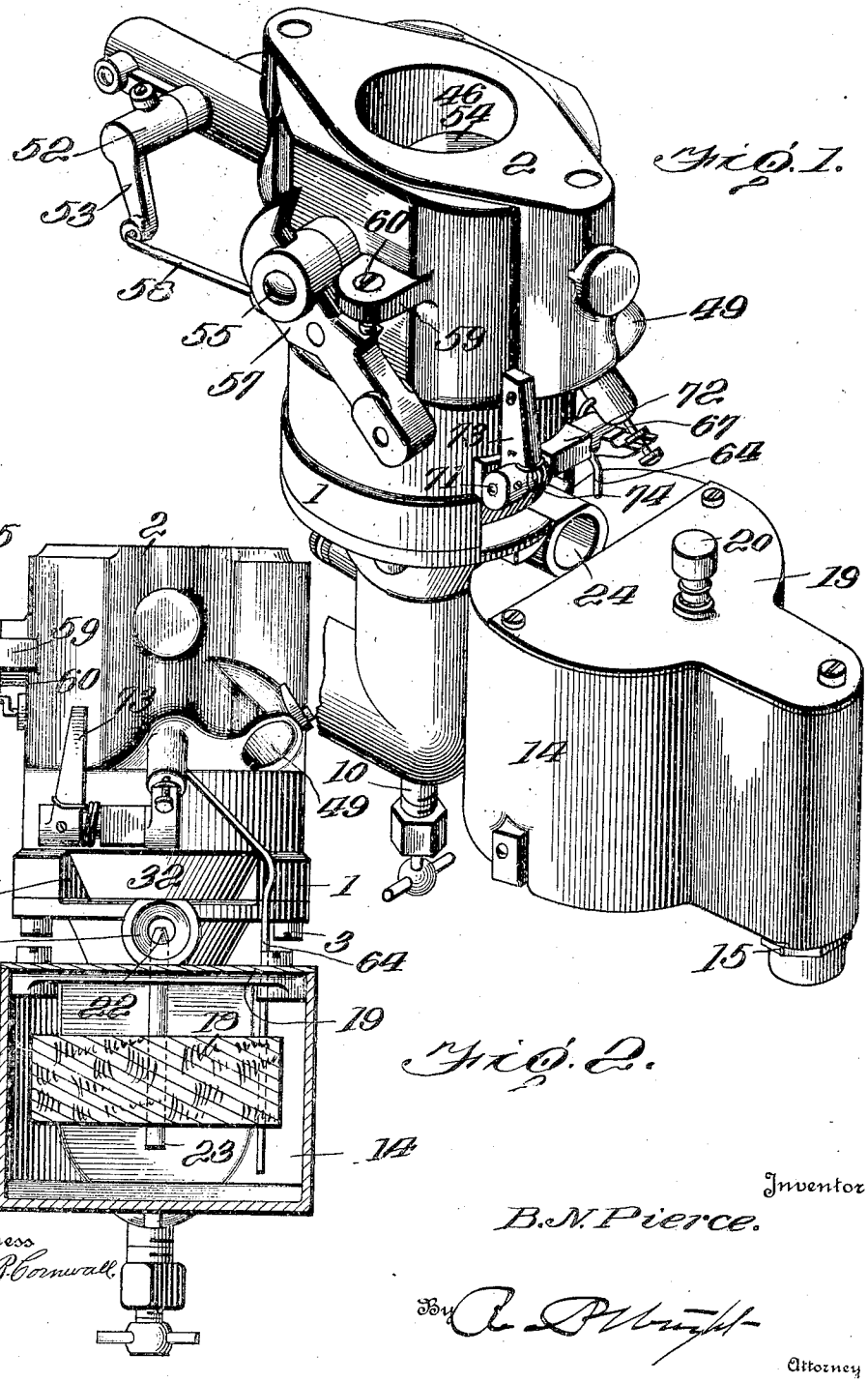


Fig. 1.

Fig. 2.

Witness
Floyd R. Cornwall.

Inventor
B. N. Pierce.

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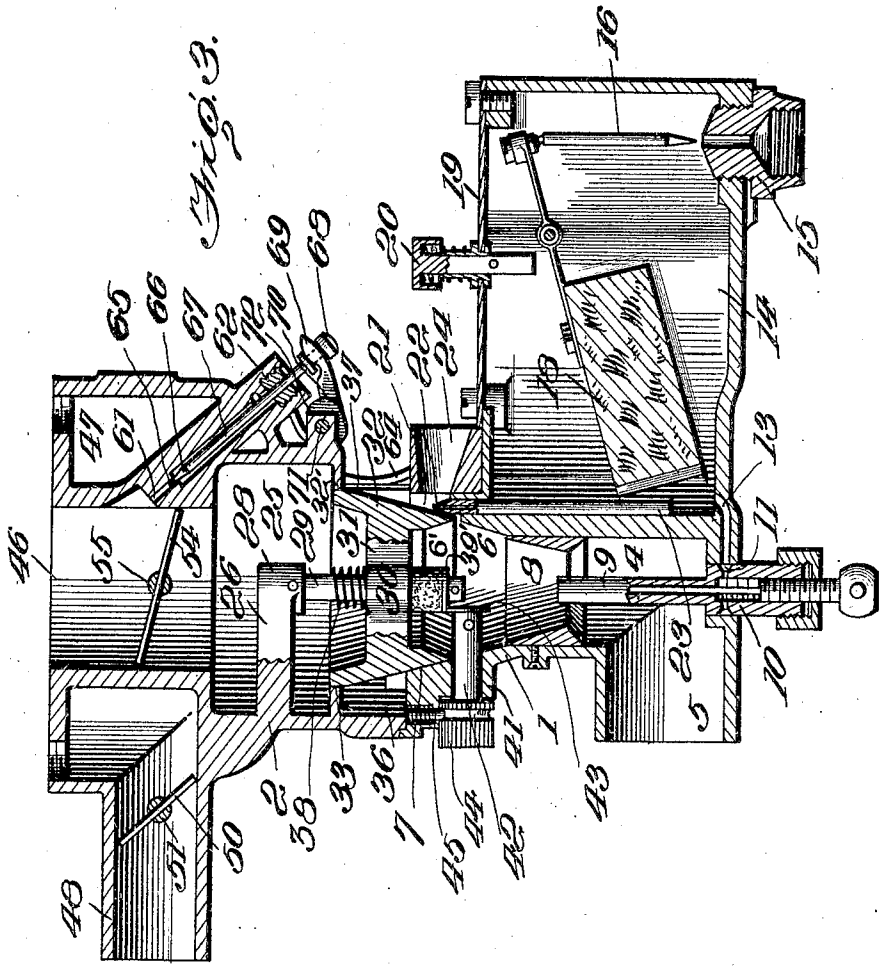
B. N. PIERCE.

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2 SHEETS—SHEET 2.

Fig. 2.



Witness
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Patented Mar. 20, 1923. 1,448,863

UNITED STATES PATENT OFFICE.

BURT NEULON PIERCE, OF BOSTON, MASSACHUSETTS.

CARBURETOR.

Original application filed March 2, 1917, Serial No. 152,028. Divided and this application filed November 12, 1917. Serial No. 201,538.

To all whom it may concern:

Be it known that I, BURT NEULON PIERCE, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Carburetors, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to a carburetor and more particularly to priming means therefor, and comprises a division of my application filed March 2, 1917, Serial No. 152,028 Patent No. 1,403,706, of January 17, 1922.

The object of the invention is to provide a carburetor with a priming jet disposed above the throttle valve having a needle valve control and provided with a fuel conduit extending to the bowl of the carburetor in order to allow pure fuel to be drawn directly from the bowl to the throttle chamber of the carburetor which enables a cold motor to be started readily.

Other and further objects and advantages of the invention will be hereinafter set forth and the novel features thereof defined by the appended claim.

In the drawings.

Figure 1 is a perspective view of my improved construction of carburetor.

Figure 2 is a vertical transverse section through the float and fuel chamber showing the needle valve control for the priming jet.

Figure 3 is a longitudinal vertical section through the carburetor.

Like numerals of reference refer to like parts in the several figures of the drawing.

In carrying out my invention I construct a carburetor of superposed castings comprising a base section 1 and top section 2 provided with laterally extending abutting annular flanges secured together by bolts 3. The base section 1 is provided with a vertically disposed air passage 4 having a lateral air inlet 5 at its lower end, said air passage 4 terminating in a conical portion 6 at its upper end forming a conical valve seat 7 for the purpose hereinafter fully described. The upper or conical portion of the air passage 4 forms a preliminary mixing chamber 6′ in which a preliminary mixture of the air and fuel is obtained so that when the mixture reaches the main mixing chamber the mixture will be completed to produce a high explosive charge as will be hereinafter fully described.

Arranged within the air passage 4 at the lower end of the conical portion 6 is a primary Venturi tube 8 into which extends a low speed nozzle 9 having a base portion 10 provided with a well, the walls of which are apertured and register with an annular groove 11 formed on the circumference of the base portion. The annular groove 11 is adapted to register with a fuel passage 13 formed by a bore extending from a float and fuel chamber 14 which is preferably formed integral with the base section 1 as clearly shown. The float and fuel chamber is provided with a fuel supply 15 controlled by a needle valve 16 carried by the arm of a float 18 which is pivotally mounted within the chamber in the usual manner. A removable cover 19 is provided for closing the float and fuel chamber which is secured thereon in any desired manner and is provided with a spring plunger 20 adapted to engage the float for forcing the same downwardly in order to raise the needle valve off of its seat so as to flood the carburetor if desired.

The wall of the conical portion 6 is cut away as shown at 21 into which extends a high speed nozzle 22 formed on the upper end of a fuel pipe 23 extending from the float and fuel chamber, said nozzle being disposed adjacent the contracted portion of a secondary Venturi tube 24 through which air is adapted to pass in order to draw fuel out of the high speed nozzzle so that the additional fuel will be discharged into the preliminary mixing chamber as will be hereinafter fully described.

The upper section 2 of the carburetor is provided with a mixing chamber 25 having a horizontally disposed arm 26 terminating in a sleeve 28 in which is secured a valve stem 29 on which is slidably mounted the bearing sleeve portion 30 of a spider 31 of a hollow conical floating suction-controlled valve 32, the lower portion of which is adapted to cooperate with the seat 7 formed by the up-

per portion of the lower section 1. The upper portion of the valve 32 is provided with a cylindrical portion 32′ adapted to cooperate with an annular seat 33 formed in the bottom of the mixing chamber 25 so as to practically close communication between the auxiliary air chamber 36 formed in the section 1, and the mixing chamber formed in the section 2. The cylindrical portion 32′ has a diameter a few thousands of an inch less than the diameter of the seat 33 formed in the bottom of the mixing chamber. The auxiliary air chamber 36 has its wall cut away above the secondary Venturi tube to produce an auxiliary air inlet 37 through which air passes when the valve is raised in an annular volume so as to follow the combustion charge entering the mixing chamber whereby a proper mixture will be obtained at all speeds of the engine.

The valve stem 29 is surrounded by a coil spring 38 above the bearing sleeve of the valve in order to produce a cushioning buffer so as to check the quick action of the valve. As the valve raises the spring is carried with the same until the spring is brought into engagement with the sleeve 28 which prevents the valve from hammering when the same is raised quickly by the increased suction of the engine.

In order to provide means for adjusting the position of the suction-controlled valve in respect to its seat, I arrange within a transverse bore 41 a shaft 42 which is provided with a cam 43 at its inner end adapted to engage the washer 39′ for raising the valve off of its seat, said shaft being provided with a milled head 44 engaged by a spring plunger 45 for locking the same in adjusted position, and in use the cam is so adjusted that the valve 32 is held slightly raised.

The upper section 2 is provided with a throttle chamber 46 surrounded by a heating chamber 47 having an inlet 48 and an outlet 49, the inlet being provided with a butterfly valve 50 carried by a valve stem 51 on which is secured the hub portion 52 of an arm 53.

A throttle valve 54 is mounted in the throttle chamber 46 upon a valve stem 55 which extends out through the walls of the section and is provided with an arm 57 connected to the arm 53 by a link 58 so as to control the intake of the heating chamber as the throttle is open and closed whereby the heating fluid entering the chamber will be proportioned in accordance with the position of the throttle valve. The section 2 is provided with a lug 59 carrying an adjusting screw 60 which is adapted to be engaged by the arm 57 for limiting the movement of the throttle valve 54 so that the same can be set so as to only partially close the throttle chamber.

The heating chamber 47 of the upper section 2 has a solid portion extending obliquely therethrough which is provided with a bore terminating in a notch formed in the throttle chamber above the throttle valve forming a priming nozzle 61. The lower end of the bore is closed by a plug 62 forming a well to which is connected a fuel supply pipe 64 which extends down into the fuel chamber 14 as shown in Figs. 2 and 3 for supplying fuel to the priming nozzle. The bore is provided with a conical seat 65 in which is adapted to be seated the conical point 66 of a needle valve 67 which is provided with a head 68 having an annular groove to receive the bifurcated end 69 of an arm 70 fixed on a rock shaft 71 pivotally mounted in a bearing formed in a lug 72 extending outwardly from the section 2 above the auxiliary air inlet. The rock shaft 71 carries an operating arm 73 which is adapted to be connected to a control lever mounted on the dash by any suitable means so that the position of the needle valve in respect to its seat can be readily adjusted from the dash of the vehicle. Surrounding the rock shaft is a coil spring 74 which has one of its ends in engagement with the casting, and the other ends connected to the arm 73 so as to normally hold the needle valve seated. This construction provides spring actuated means for normally holding the priming nozzle closed, and for closing the same after the valve has been manipulated from the dash to start the motor.

When the throttle is in closed position, and it is desired to start the engine by operating the dash control, the needle valve can be adjusted in respect to its seat to allow fuel to be drawn by the suction of the engine into the throttle chamber above the throttle valve so as to prime the motor by allowing pure fuel to be drawn directly into the cylinders thereof. By the provision of a needle valve for controlling the priming jet I provide a graduated control which enables me to allow any desired amount of fuel to be drawn directly into the motor for starting the same.

In the operation of the priming jet in starting the motor fuel will be drawn directly from the bowl into the throttle chamber above the throttle valve so that the suction of the engine will draw fuel into the cylinders thereof in order to allow the same to start quickly.

I claim:

A carburetor having a throttle chamber and a throttle valve for closing said chamber, a heating chamber surrounding said throttle chamber having a solid portion extending obliquely therethrough provided with a bore terminating at a point beyond the throttle within said throttle chamber, a plug for closing the lower end of said

bore forming a well, a fuel conduit extending from said well to a source of supply, a needle valve slidably mounted within said plug for controlling the passage of fuel into said throttle chamber, said valve being provided with a head having an annular groove, a rock shaft having a bifurcated arm extending into the groove of said head and a spring surrounding said rock shaft for holding said needle valve in closed position.

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

BURT NEULON PIERCE.

Witnesses:
HARRY J. CARLSON,
FRED W. NICHOLS.