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CARBURETOR STRUCTURE

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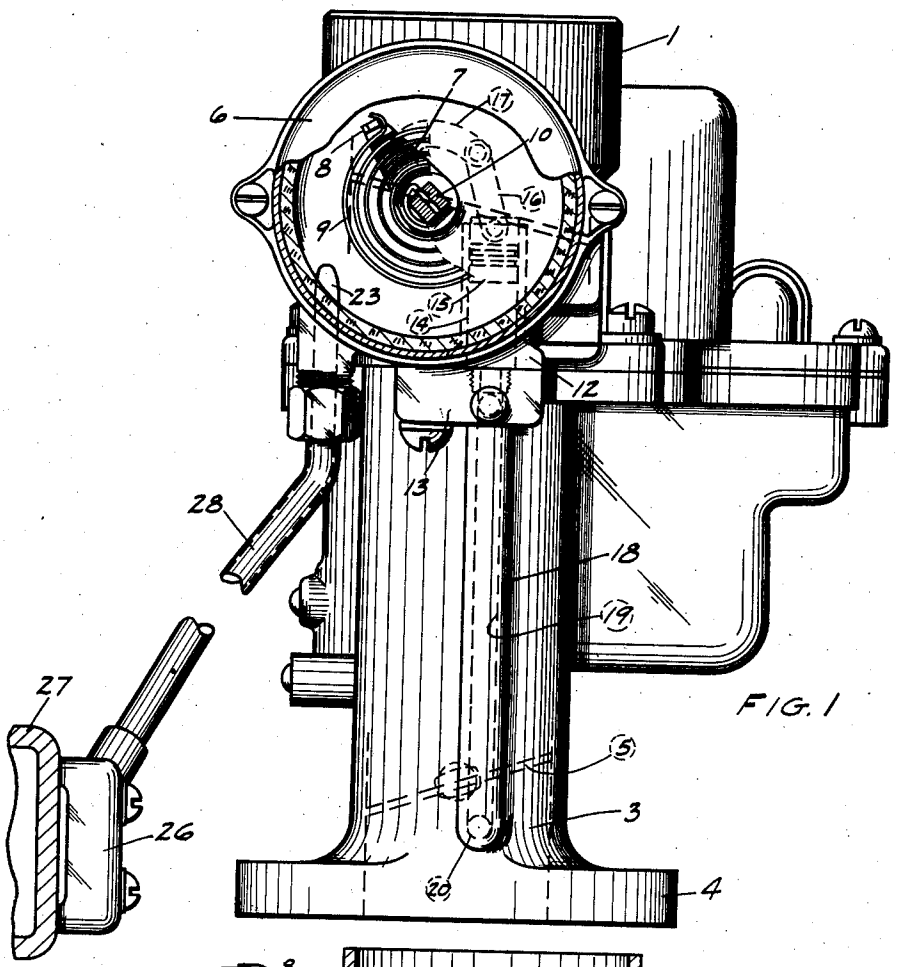


FIG. 1

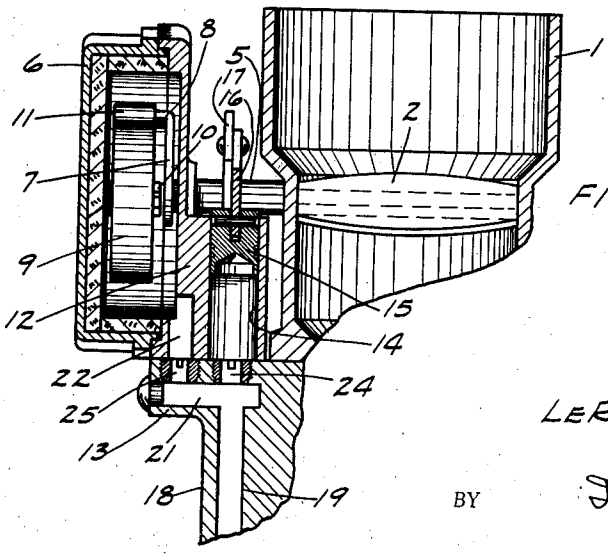


FIG. 2

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CARBURETOR STRUCTURE

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3 Claims. (Cl. 123—119)

This invention relates to carburetors for internal combustion engines and consists, particularly, in novel automatic carburetor choke control means.

A well known carburetor automatic choke control utilizes a casing secured to the carburetor body and enclosing a bi-metal thermostat and a suction piston, both connected to the carburetor choke valve for controlling the same. A stove or heater mounted on the exhaust manifold of the associated engine has a connection with the interior of the housing and there is a suction connection between the cylinder which receives the suction piston and a point in the carburetor barrel posterior to the throttle. This suction connection controls the suction piston mentioned above and, by means of a by-pass in the wall of the cylinder, also functions to draw heated air from the stove through the housing so as to more quickly heat the thermostat, the amount of hot air drawn varying in accordance with the position of the suction piston. An example of this arrangement is disclosed and claimed in a copending application, Serial No. 679,201, filed July 6th, 1933, in the name of Irven E. Coffey.

The above described automatic choke control, in general, has functioned very satisfactorily, but there has been some difficulty in accurately adjusting and calibrating the suction and thermal control mechanisms due to the fact that the same suction connection used with the suction piston also controls the heat applied to the thermostat. Thus, variation of the effective by-pass around the suction piston affects the pressure applied to the piston itself, both due to the leak around the piston and the fact that the pressure in the housing is reduced. The suction necessary for drawing heat and controlling the suction piston may not be so closely related as to be properly controlled in the above manner.

It is an object of the present invention to provide, in an automatic choke control, in general, of the above type, substantially independent heat and suction controls. Another object is to mount the suction piston outside the thermostat housing whereby atmospheric pressure is constantly applied to the piston.

These objects and other more detailed objects hereafter appearing are attained substantially by the structure illustrated in the accompanying drawing, in which:

Figure 1 is a side view of a carburetor with the invention applied thereto, a part of the automatic choke control being broken away and sectioned for clearer illustration, and

Figure 2 is a vertical section showing a part of the structure in Figure 1 and taken at 90 degrees thereto.

The carburetor illustrated has a downdraft mixture passage including air inlet horn 1, having a pivoted, unbalanced, choke valve 2 mounted therein, and an outlet portion 3 flanged as at 4 for attachment to the intake manifold, not shown, of an associated engine. A throttle valve 5 is mounted near the outlet portion and is provided with the usual manual control, not shown. Choke shaft 5 extends laterally beyond the carburetor barrel and into an insulated housing indicated generally at 6. Secured to shaft 5 within housing 6 is an arm 7 having finger 8 at its outer end. A bi-metal, coiled thermostat 9 is rigidly secured at its inner end to a pintle 10, projecting from the removable cover portion of housing 6 and, at its outer end, has a lip 11 hooked around finger 8. The thermostat is of the type to expand or unwind when the temperature is low so as to yieldingly hold the choke valve closed, as shown in Figure 1. Temperature increases in the housing relieve the tension on the choke valve permitting the valve to be opened by its own weight or by air flowing through the mixture conduit.

Projecting inwardly from thermostat housing 6 is a block 12 which rests on and is secured to a ledge 13 projecting from the carburetor body. Formed in block 12 is a vertical cylinder 14 slidably receiving a closely fitting piston 15 pivotally secured to a link 16. Link 16 is pivoted at its upper end to a curved or angular arm 17 rigid with the choke shaft between housing 6 and the air horn.

Extending downwardly along the carburetor body is a ridge 18 having a longitudinal perforation 19 communicating at its lower end with the carburetor mixture conduit posterior to throttle 5, as at 20, and at its upper end with a cross passage 21. Passage 21 has connections with the interior of cylinder 14 and with a passage 22 in block 12, which opens into housing 6, as at 23. These connections are provided with readily removable, threaded restrictions 24 and 25.

When the carburetor is in operation, suction applied through perforation 19 is transmitted through restriction 24 to cylinder 14 so as to draw piston 15 downwardly, positively opening the choke valve against the thermostat tension. Due to the unbalanced construction of the choke valve, suction within the mixture conduit also assists in opening the valve. Carburetor suction is also applied through restriction 25 to the interior of housing 6 so as to draw heated air thereinto

through tube 28 from the stove 26. The stove may be mounted on any convenient portion 27 of the engine, which is heated to a degree corresponding to the temperature of the firing chambers, the exhaust manifold being commonly used for this purpose.

As best shown in Figure 2, suction is applied to piston 15 through a separate branch and is independent of the suction applied to the interior of housing 6. The suction applied to the piston may be separately controlled and varied by means of the removable restriction 24. Thus, if it is desired that the suction piston act more or less positively, this result may be affected by merely increasing or decreasing the size of restriction 24, or it may be accomplished by providing for leakage around the piston, without substantially affecting the heat drawn through housing 6. In turn, the heat applied to the thermostat may be adjusted and controlled by means of the independently adjustable restriction 25. The suction piston is, accordingly, constantly subjected to atmospheric pressure on its outer surface and to carburetor suction on its under surface, unaffected by influences not directly related to the piston operation. The pressure to which the thermostat is subjected is immaterial and, accordingly, the pressure in the housing may be varied as desired, so as to draw more or less heat from the stove and restriction 24 adjusted to provide the proper suction piston action. Preferably, piston 15 and cylinder 14 fit closely so that little or no air can leak past the piston to affect the suction in passage 21.

Separate, threaded restricting inserts, as shown, provide for increased utility, but in practice it may be desirable to bore out corresponding holes in ledge 13 to the proper size and eliminate the removable parts.

The invention may be modified in this respect and others as will occur to those skilled in the art, and the exclusive use of all such modifications as come within the scope of the appended claims is contemplated.

I claim:

1. In combination, a carburetor mixture conduit, a choke valve therein, a housing, thermal control means for said valve inside said housing, suction control means for said valve exposed to atmosphere outside said housing, means for supplying to the interior of said housing gases heated in accordance with the temperature of the associated engine, and suction connections between the interior of said housing and said conduit and said suction control means and said conduit.

2. The combination of elements specified in claim 1 further including a removable restriction in each of said connections to permit application of restrictions of different sizes for varying the effective suction applied to said housing and said suction control means.

3. The combination of elements specified in claim 1 in which said suction control means is carried by said housing.

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