

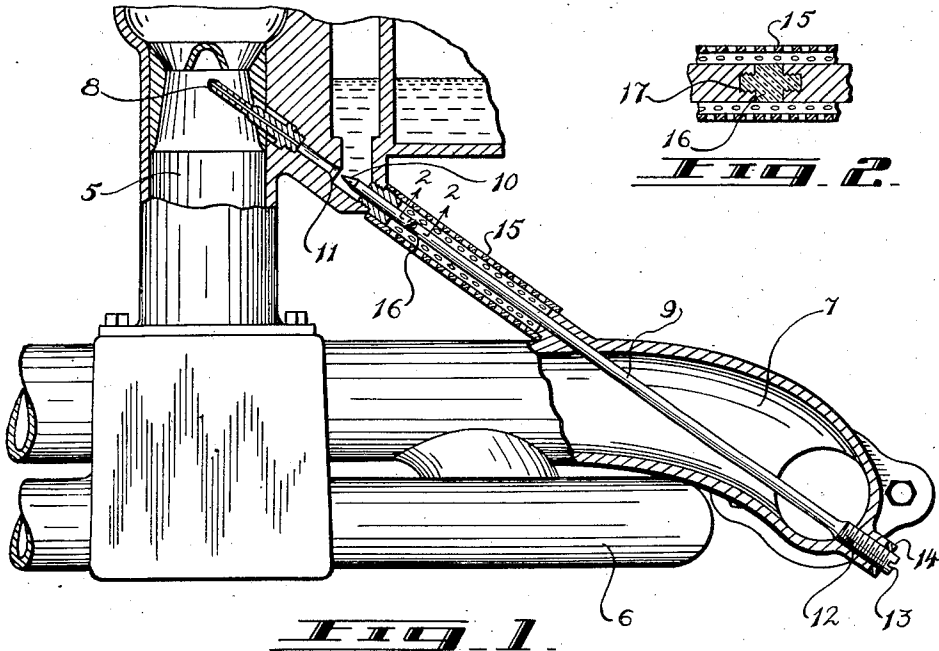
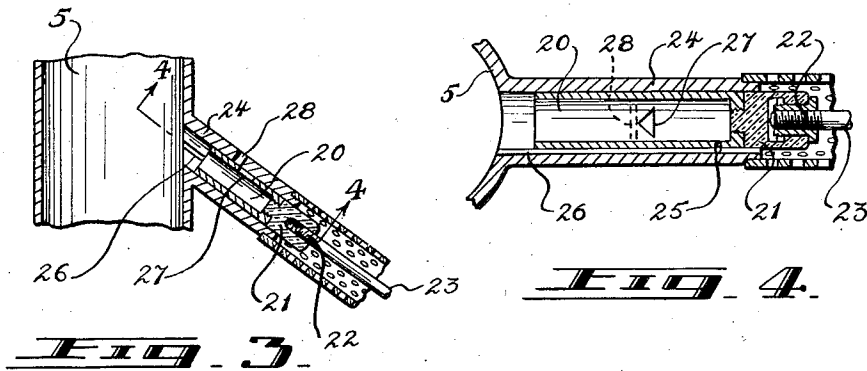
April 14, 1936.

S. ROGERS

2,037,486

THERMOSTATIC CONTROL

Filed Aug. 28, 1935



INVENTOR
Stewart Rogers
BY *W. J. Haskell*
ATTORNEY

UNITED STATES PATENT OFFICE

2,037,486

THERMOSTATIC CONTROL

Stewart Rogers, Toronto, Ontario, Canada

Application August 28, 1935, Serial No. 38,229
In Canada February 16, 1932

5 Claims. (Cl. 123—124)

This invention relates to improvements in a thermostatic control and appertains particularly to one adapted for use with carburetors of internal combustion engines for automatically regulating the mixture therein.

An object of the invention is to provide a thermostat responsive to more than one heating influence so that a "combined" action is obtainable.

A further object of the invention is to provide a thermostatic control that will impress an uneven reaction caused by subjection to direct and indirect exposure to the motivating element.

A further object of the invention is to provide a thermostatic control whose positive operation is in terms of a combined movement initially rapid and then slow produced by the direct and subsequently indirect treatment of the thermostatic control element.

A further object of the invention is to provide a thermostatic control wherein the element is partially exposed to and partially guarded from exposure to the actuating force so that a dual expansion movement of the element occurs first by the substantial expansion effect of the actuating force directly on the entire exposed part and subsequently by the lesser and retarded expansion of the guarded part as the actuating force gradually reaches it by conduction bit by bit.

A still further object of the invention is to provide a thermostatic control of the nature and for the purposes described, intended for use in a down draft carburetor, wherein the combined action rod with exposed and guarded portions in its length is adjustably extended through the exhaust manifold, and that is characterized by structural simplicity, operative efficiency and low cost of production being thereby rendered commercially desirable.

To the accomplishment of these and related objects as shall become apparent as the description proceeds, the invention resides in the construction, combination and arrangement of parts as shall be hereinafter more fully described, illustrated in the accompanying drawing and pointed out in the claims hereunto appended.

The invention will be best understood and can be more clearly described when reference is had to the drawing forming a part of this disclosure wherein like characters indicate like parts throughout the several views.

In the drawing:—

Figure 1 is a sectional elevation of a down draft carburetor and intake and exhaust manifold assembly with the invention incorporated;

Figure 2 is an enlarged sectional detail of the insulation block in the control rod, as taken on line 2—2 of Figure 1;

Figure 3 is a vertical section of a modified form of valve that may be carried by the control rod; and

Figure 4 is an enlarged section at right angles thereto, as on the line 4—4 of Figure 3.

In the embodiment of the invention illustrated in Figures 1 and 2, the thermostat is incorporated in a needle valve and its combined rapid direct and delayed indirect expansion operate to automatically control the fuel mixture. Here is shown a down draft carburetor 5 communicating with an intake manifold 6 that is closely associated with the exhaust manifold 7. The fuel jet 8 of the carburetor 5 is controlled by a needle valve 9 that is automatically adjustable.

This needle valve 9 is a long rod that extends through the exhaust manifold and into the carburetor, its inner end 10 is pointed in the usual needle valve style and operates to and from the correspondingly shaped fuel jet seat 11. The opposite or outer end 12 of the rod 9 is enlarged and threaded for longitudinal adjustment in the side of the exhaust manifold 7 remote from the carburetor 5, is notched as at 13 for reception of a screw driver or like tool and carries a jamb nut 14. After passing through the exhaust manifold 7 the rod 9 is covered from the exhaust manifold to the carburetor by a surrounding perforated pipe 15 spaced from the rod that acts as a shield as well as preventing excessive radiation, the said pipe being supported at its opposite ends by the exhaust manifold and carburetor respectively. The rod 9 is broken short of its needle valve end 10 and an insulating block 16, with threaded bosses 17 on opposite sides for reception by drilled and interiorly threaded confronting ends of the rod 9, inserted.

The hereinbefore described form of the invention employed the control rod to regulate the liquid supply jet while in Figures 3 and 4 a modified valve is shown that automatically operates an auxiliary air inlet bleed valve that opens to lessen the liquid fuel content of the ingoing mixture and so in reverse manner serves the same purpose as the previous form.

The modified valve 20 is a hollow cylinder closed at one end to receive the insulation block 21 threaded therein which is in turn rotatably carried on the threaded end 22 of the rod 23 corresponding with the former rod 9. The non-illustrated end of the rod 23 is similarly shielded

by a perforated sleeve or pipe and passed through the exhaust manifold at its outer end which is likewise adjustable in the manifold as has been explained.

5 The hollow cylindrical valve 20 is slidable longitudinally in an inlet pipe 24 communicating with the intake manifold attachment part of the carburetor 5 and is held non-rotatable with respect to the said pipe 24 by an axially extending pin 25
10 slidable in the slot 26 in the interior of said pipe. A triangular aperture 27 occurs in the side wall of said cylindrical valve 20 with its apex towards the carburetor and in the wall of the pipe 24, just ahead of the normal inoperative position of
15 said triangular aperture 27, there is a circumferentially extending slot 28 of a length at least equal to the base of the said aperture.

In conclusion, following the detailed recitation of the construction of two possible embodiments of the invention, it should suffice to make but
20 brief reference to its use and modus operandi:

The rod is preferably adjusted to give the desired economical performance after the engine has been running for some time and has acquired
25 its normal running temperature. When the engine is stopped and has cooled, the rod 9 contracts opening the jet valve wide, thus when the engine is started a rich mixture is supplied that is rapidly cut as the rod expands under the direct force
30 of the exhaust against all that length of the rod that lies open in the exhaust manifold. This expansion represents the major closing movement of the needle valve, but a secondary and extending closing movement also sets in; it is delayed for
35 a while and then begins to manifest itself slowly and gradually as the engine as a whole, block and all, warms up thinning the lubricant, reducing the load and still further heating the ingoing fuel; it is produced by the expansion of the
40 shielded length of rod, between the exhaust manifold and the needle valve end or the inserted insulation block, by gradually creeping conduction from the highly heated part of the rod exposed to the direct force of the exhaust. The surrounding
45 perforated pipe affords the necessary ventilation while preventing excessive radiation.

In the auxiliary air inlet bleed valve shown in the modified form, a substantially similar action occurs, the air inlet as a choke is closed to begin
50 with but quickly opens just a little and gradually opens wider as the engine warms up, thinning the mixture automatically in keeping with the engine's requirements.

In either case the initial action is a rapidly occurring major movement, following and in addition to which comes a suitably retarded but gradually increasing subsequent movement. The relative extent as well as the chronological spacing of these respective movements are susceptible of such change within wide limits as the
60 nature of any specific installation may require.

From the foregoing description taken in connection with the accompanying drawing, it will be manifest that a thermostatic control is provided
65 that will fulfill all the necessary requirements of such a device but as many changes could be made in the above description and many apparently widely different embodiments of my invention may be constructed within the scope of the appended claims without departing from the spirit
70

or scope thereof, it is intended that all matters contained in the said accompanying specification and drawing shall be interpreted as illustrative and not in a limitative or restrictive sense.

Having thus described the invention, what is 5 claimed as new is:—

1. In combination with an internal combustion engine, a thermostatic control for a carburetor or the like comprising a rod threaded at one end, extended through the exhaust manifold across the
10 open intervening space, and into the carburetor, the remoter of the openings in the exhaust manifold being threaded to receive the threaded end of the rod whereby the same is longitudinally adjustable and a jamb nut on the threaded end of
15 said rod exterior of said exhaust manifold.

2. In combination with an internal combustion engine, a thermostatic control for a carburetor or the like comprising a rod threaded at one end, extended through the exhaust manifold, across
20 the open intervening space, and into the carburetor, the remoter of the openings in the exhaust manifold being threaded to receive the threaded end of the rod whereby the same is longitudinally adjustable and a shield surrounding said rod
25 between said exhaust manifold and said carburetor.

3. In combination with an internal combustion engine, a thermostatic control for a carburetor or the like comprising a rod threaded at one end, extended through the exhaust manifold, across
30 the open intervening space, and into the carburetor, the remoter of the openings in the exhaust manifold being threaded to receive the threaded end of the rod whereby the same is longitudinally adjustable and a perforated pipe enclosing the otherwise exposed length of said rod between said exhaust manifold and said carburetor.
35

4. In combination with an internal combustion 40 engine, a thermostatic control for a carburetor or the like comprising a rod threaded at one end, extended through the exhaust manifold, across the open intervening space, and into the carburetor, the remoter of the openings in the exhaust manifold being threaded to receive the threaded end of the rod whereby the same is longitudinally adjustable and an insulation block inserted in said rod near its carburetor end.
45

5. A thermostatic control for a carburetor 50 comprising in combination with an internal combustion engine having an exhaust manifold and a carburetor spaced from one another; a pair of transverse openings in said exhaust manifold and an opening into said carburetor all aligned, the remoter of said openings in the exhaust manifold being threaded; a rod passing through said aligned openings, threaded at one end for longitudinal adjustment in the threaded opening in
55 said exhaust manifold and freely slidable in the other of said aligned openings; an insulation block inserted in said rod near the carburetor end thereof; a perforated pipe spaced concentrically of said rod and supported at opposite ends by said exhaust manifold and carburetor respectively; a tool receiving notch across the threaded end of
60 said rod and a jamb nut threaded on said threaded end exterior of said exhaust manifold.
65