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1,754,028

CHOKE CONTROL DEVICE

Filed May 10, 1927

2 Sheets-Sheet 1

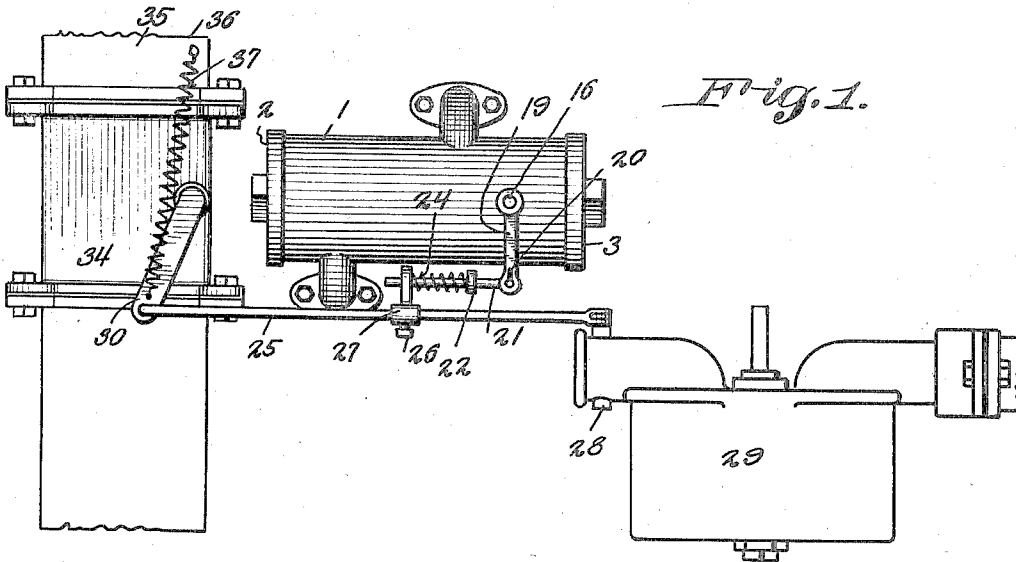


Fig. 1.

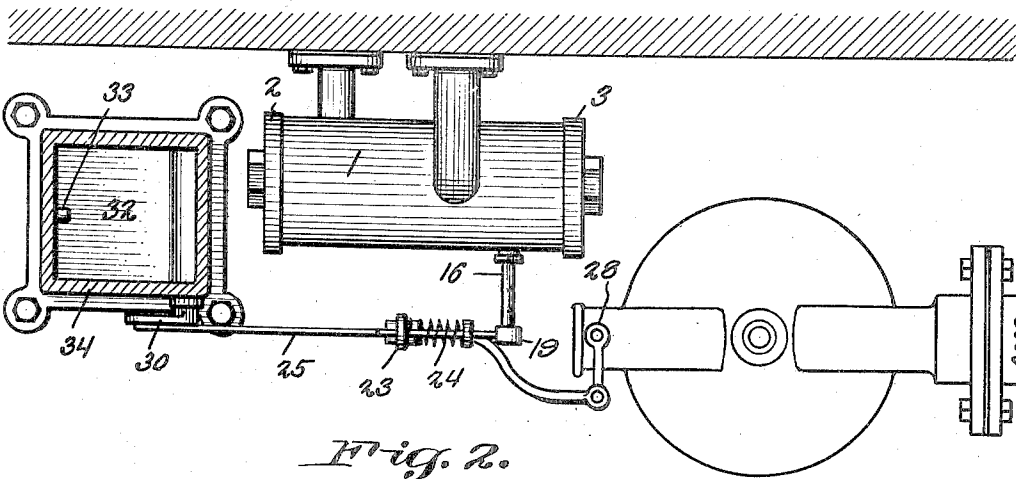


Fig. 2.

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Witnesses
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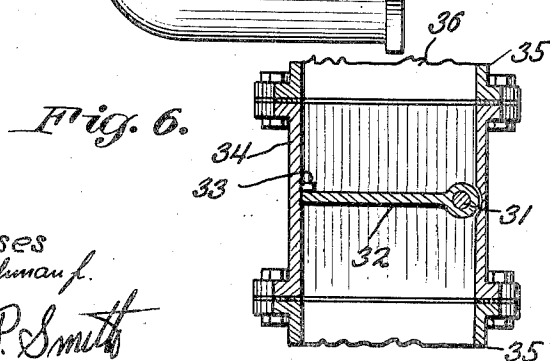
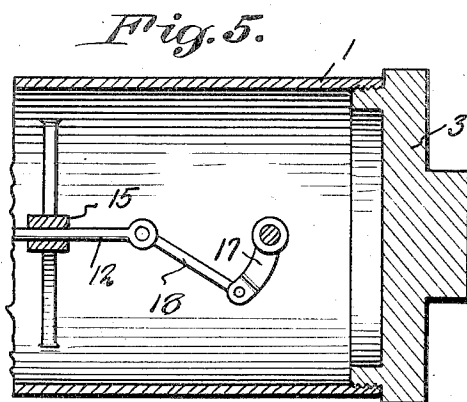
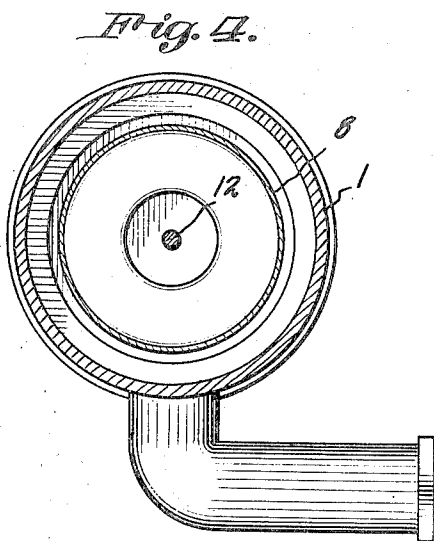
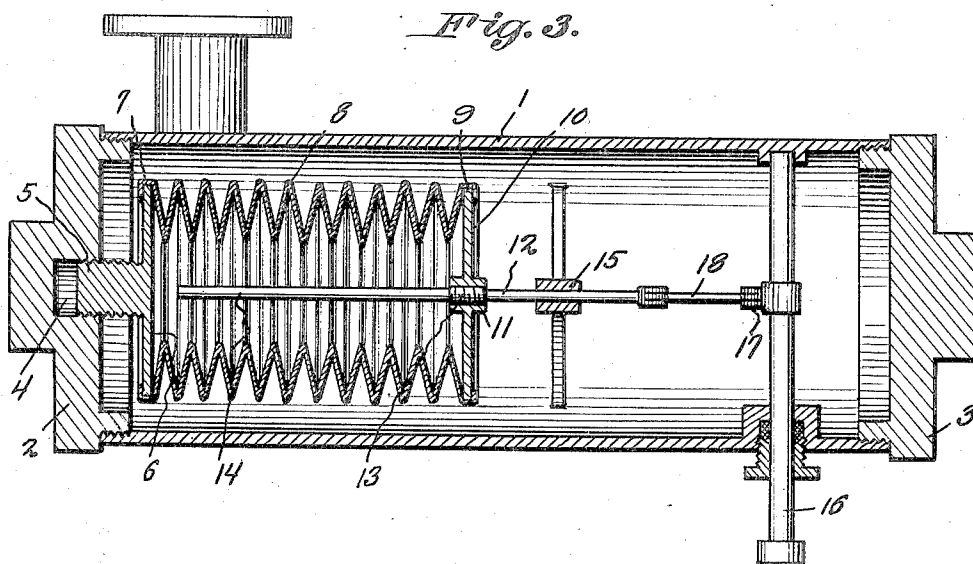
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CHOKES CONTROL DEVICE

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2 Sheets-Sheet 2



Witnesses
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UNITED STATES PATENT OFFICE

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CHOKE-CONTROL DEVICE

Application filed May 10, 1927. Serial No. 190,286.

This invention relates to a choke control device for internal combustion engines, and has for its primary object the construction of a device that may be arranged in position to be subject to the increase and decrease in temperature of an internal combustion engine so that the change in temperature may be relied on to control the operation of the carbureter and change the density of the fuel mixture to the engine according to the temperature of the latter.

An object of the invention is to provide a heat control device for controlling the operation of the carbureter and provide a separate device controlled by the exhaust gases from the engine for controlling the carbureter independently of the choke device.

Another object of the invention is the provision of two controls for the carbureter, one under the influence of the temperature of the engine, the other under the influence of exhaust gases from the engine so that the former may be utilized to accurately control the carbureter over long periods, whereas the latter may be used for instantly adjusting the carbureter as soon as the engine starts firing.

Besides the above, our invention is distinguished in the use of a heat operated device and exhaust operated device operating in unison to control the action of a carbureter separately or jointly.

A feature of our invention is the yieldable adjustable connection between the heat actuated device and the exhaust actuated device so that the proper functioning of these devices may be provided for.

With these and other objects in view, our invention will be better understood from a description of the same when taken in connection with the accompanying drawings, wherein:—

Figure 1 is a diagrammatic view showing the application of our improved choke control device;

Figure 2 is a top plan view thereof;

Figure 3 is a longitudinal sectional view of the housing and associated parts;

Figure 4 is a cross sectional view;

Figure 5 is a fragmentary sectional view; Figure 6 is a vertical sectional view of the flap valve and associated parts;

In the drawings, we have illustrated one of the many constructions of the invention comprising a housing 1 to be arranged in communication with the water system of an internal combustion engine or to be supported contiguous to the walls of the engine so as to be subject to the heat generated by the latter. This housing 1 includes end plates 2 and 3, the former provided with a threaded recess 4 for adjustably receiving the threaded plug 5 projecting from the disk 6 that is secured to the fixed end 7 of the bellows or coil type of thermostat 8. The free end 9 of the thermostat is also secured to a disk 10 having a centrally arranged boss 11 secured to the intermediate portion of a rod 12, as indicated at 13. One end 14 of this rod is spaced a predetermined distance from the disk 6 so that the latter may act in the capacity of a stop for limiting the contractile action of the thermostat so that when the thermostat is in normal position, the maximum amount of surface will be exposed to the circulating water within the housing. This rod 12 reciprocates in the spider type of guide 15 carried by the interior of the casing.

An actuating shaft 16 is provided with a crank arm 17 that is pivotally connected by a link 18 to the rod 12. The protruding end of the shaft 16 has secured thereto a crank arm 19 that has a pin and slot connection 20 with a slide 21. This slide 21 has fixed there-to a collar 22 between which and a bracket 23 is arranged a spring 24. This spring 24 provides the connection between the slide and the bracket so that in the swinging movement of the arm 19, the bracket 23 will be yieldably operated in a manner to allow independent movement of the bracket 23 under certain conditions. This bracket 23 is adjustably mounted on a link 25 by means of the set screw 26 mounted in the hub 27 of the bracket. This link 25 has one end pivotally connected to the air valve 28 of any suitable type of carbureter 29. The other end of the link 25 is pivotally connected to a crank arm 30 that is in turn secured to the stub shaft 31 of the

flap valve 32 abutting a stop 33 when in closed position. This flap valve 32 is housed within a pipe section 34 that interfits with sections 35 of the exhaust pipe 36. The arm 30 extends downwardly from the shaft 31, and the free end thereof occupies a position inwardly beyond the shaft when the valve 32 is closed and outwardly beyond the shaft when the valve is opened. A spring 37 which is secured to the free end of the arm 30 and to the exhaust pipe 36 at a point above the shaft 31, functions to yieldingly hold the valves 28 and 32 in closed or opened position. The spring 24 establishes a yielding connection between the bracket 23 and the collar 22, and when the thermostat 8 is contracted, this spring permits the valves 28 and 32 to be moved in the direction of their opened position by the action of the exhaust gases against the valve 32. This spring also permits the valves 28 and 32 to be released by and as the result of the expansion of the thermostat 8.

In the application of our improved device to an internal combustion engine, the parts will when the engine is cold assume a position to close the air valve 28 thereby enabling a rich mixture to be drawn from the carbureter into the engine to initially start the engine. Upon the initial firing of the engine, the exhaust gases impinging upon flap valve 32 will throw the same to partially opened position against the tension of the springs 24 and 37, and as a result of its connection with valve 28 the latter will be opened so as to increase the air flow into the carbureter. As the temperature of the engine increases, the thermostat will expand and through the action of the link mechanism the slide 21 will be moved, thereby permitting the action of the exhaust gases against the valve 32 to further open this valve and the valve 28 against the tension of the springs 24 and 37. As the temperature continues to increase, the thermostat will continue to expand, thereby permitting the action of the exhaust gases against the valve 32 to fully open this valve and the valve 28, in which positions they will be held until again closed by the thermostat on the cooling of the engine.

Thus in a very simplified manner we have designed and brought together two types of mechanism acting jointly to properly and efficiently control the flow of air to the carbureter, which in turn controls the character of the fuel drawn into the engine. As it requires a predetermined amount of time for the cooling system to be properly heated, it will be appreciated that it is a decided advantage to use the flap valve, as the same will function to immediately adjust the valve 28 as soon as the engine begins to fire, as otherwise there is a tendency in certain types of carbureter to "flood" if the valve 28 remains closed after the starting of the engine. The coaction and correlation of the thermostatic

device and the flap valve device is such as to provide a very sensitive structure to assure responses immediately upon changes in the temperature of the engine and the operation thereof, which is facilitated by the location of the spring 37 that functions to yieldingly hold the flap valve in either closed or opened position. The spring 37 also tends to draw the flap valve 32 into opened position after it has been moved a predetermined distance by the exhaust gases, and to draw the flap valve into closed position after it has been moved a predetermined distance by the thermostat.

It is, of course, to be understood that the housing may communicate directly with the cooling system or be attached to various portions of the engine to be subject to the heat generated by the engine and may be constructed and designed in various other manners than illustrated and the various connecting parts or mechanisms may be designed and assembled in other relations than illustrated and, therefore, we do not desire to be limited in any respect except as set forth in the following claims.

We claim:—

1. A choke control device comprising, in combination with the air valve of a carbureter, an exhaust gas actuated mechanism for adjusting the air valve, and a thermostat arranged to be actuated by the heat of the engine and controlling the extent of the adjustment of the air valve by said mechanism.

2. A choke control device comprising an exhaust gas means for initially operating the air valve of a carbureter, and heat actuated means for effecting the final adjustment of the air valve of the carbureter.

3. A choke control device for carbureters comprising a thermostat, a yielding adjustable connection between the thermostat and the air valve of the carbureter, and an exhaust actuated valve having a direct rigid connection with the air valve of the carbureter.

4. A choke control device comprising a housing arranged for communication with the cooling system of an internal combustion engine, a thermostat arranged therein, control mechanism secured to said thermostat including a crank arm, a flap valve adapted to be arranged in the exhaust pipe of the engine, a link connection between the flap valve and the air valve of the carbureter, and a yieldable adjustable connection between said link and said crank arm.

5. A choke control device comprising a housing for communication with the cooling system of an internal combustion engine, a thermostat arranged therein, operating mechanism connected to said thermostat and including a crank arm, a flap valve adapted to be positioned in the exhaust pipe of the engine to be actuated by the gases passing

therethrough, a spring normally holding the flap valve closed, a link operatively connecting the flap valve with the air valve of the carbureter, a bracket adjustably mounted on said link, a slide pivotally connected to said crank arm and slidably mounted in said bracket, and a spring arranged to control an operative connection between said slide and said bracket.

6. In an internal combustion engine, the combination with the air valve and the exhaust pipe thereof, of a valve pivoted within the exhaust pipe, a link connecting the valves, a spring connected to said second valve and adapted to hold both valves in opened or closed position, a thermostat, and means connected to the link and adapted to be operated by the thermostat to move the link in valve closing or valve opening direction.

In testimony whereof we affix our signatures.

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