Jan. 6, 1953 H. A. BOLLER 2,624,363

CHOKE VALVE CONTROL

Filed May 1, 1947

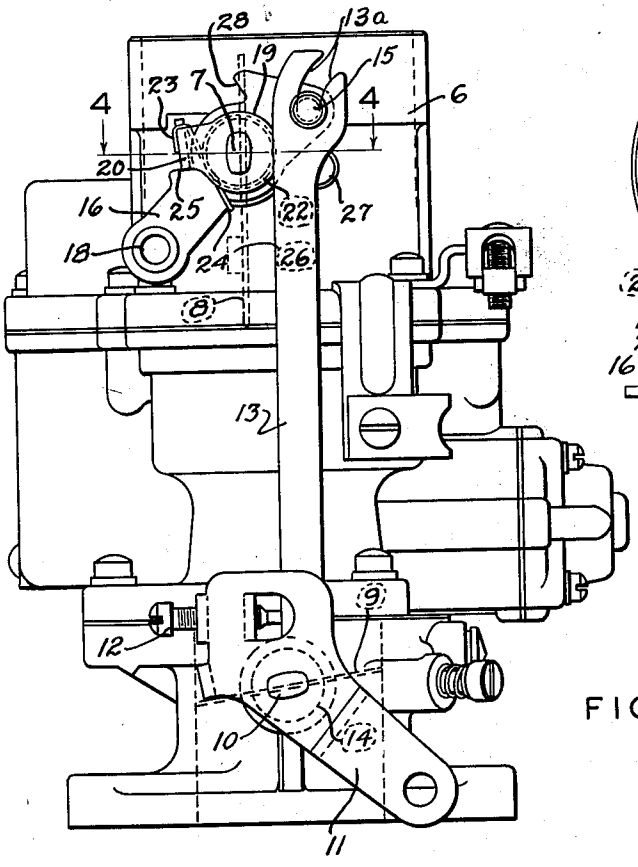

FIG. 1.

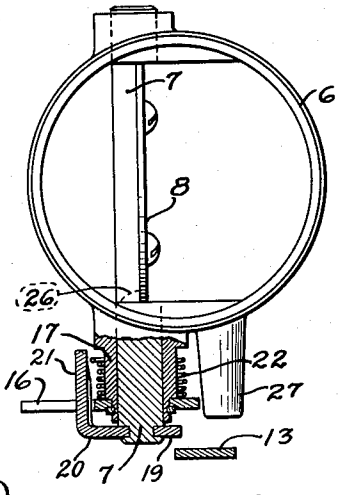

FIG. 4.

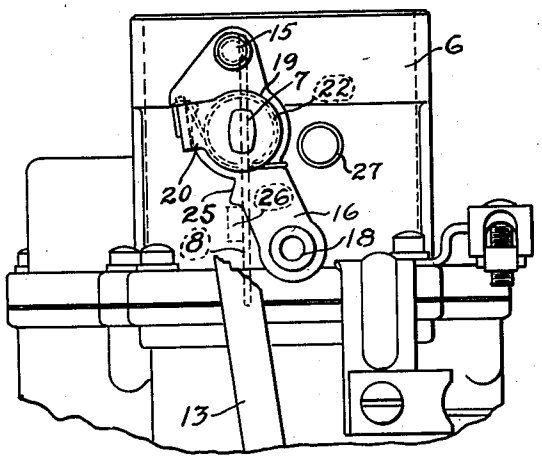

FIG. 2.

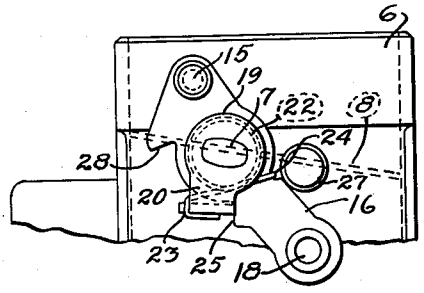

FIG. 3.

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Patented Jan. 6, 1953 2,624,363

UNITED STATES PATENT OFFICE

2,624,363

CHOKE VALVE CONTROL

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Application May 1, 1947, Serial No. 745,273

3 Claims. (Cl. 137—481)

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This invention relates to carburetors for internal combustion engines of the automotive type and consists particularly in a novel manual choke valve control therefor.

A familiar form of manual choke control, as now used with the Chevrolet carburetor, comprises a lever loosely journalled on the choke shaft and connected to the shaft by a spring whereby the choke is closed through the spring. Even in its fully closed position, the unbalanced choke is free to breathe against the spring under the influence of air flow applied directly thereto. A difficulty with this choke has been that, in some instances, the valve sticks in its wide open position and the tension of the spring has not been sufficient to dislodge the valve.

Accordingly, an object of the present invention is to provide an additional feature in the above type of choke control whereby in case of sticking of the choke valve in wide open position, means is provided to positively initiate the closing movement thereof.

A more detailed object is to provide a choke control lever having a part disposed to strike a projection from the choke shaft just prior to the extreme movement of the lever in the choke closing direction to positively dislodge the choke in case of its sticking in the wide open position.

The above objects and others are attained by the structure illustrated in the accompanying drawing in which

Fig. 1 is a side view of an automotive carburetor embodying the invention.

Fig. 2 is a similar view of the upper part of the carburetor showing the parts in a different position and the fast idle link partly broken away.

Fig. 3 is a view similar to Fig. 2 but showing the parts in a third position.

Fig. 4 is a detail section on line 4—4 of Fig. 1.

The carburetor is of the downdraft type including an air inlet horn 6 in the walls of which there is journalled a choke draft 7 carrying an unbalanced butterfly choke valve 8. Discharge from the lower end of the mixture barrel is controlled by a butterfly throttle valve 9 on a shaft 10 having a control lever 11 rigid therewith. An adjusting screw 12 mounted in lever 11 is positioned to engage a link 13 journalled at its lower extremity on a boss 14 surrounding throttle shaft 10 to establish the idling position of the throttle valve. The upper end of link 13 has an inclined clevis 13a receiving a pin 15 on choke operating lever 16.

Lever 16 is journalled on boss 17 projecting from air horn 6 and has an aperture 18 for con-

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nection to a rod or Bowden cable extending to the operator's compartment. The extremity of choke shaft 7 extending through boss 17 rigidly mounts a small disk 19 having a radial projection 20 with an inwardly offset lip 21 which overlies lever 16. A torsion spring 22 received about boss 17 has its extremities hooked about lip 21 and the lever, as at 23 and 24 and normally maintains this lip in engagement with a shoulder 25 on the lever. Thus, the spring resists opening movement only of the valve relative to the lever. A stop 26 formed on the inside wall of the air horn limits the fully open position of the choke valve while the walls of the inlet itself limit the closed position of the valve. An additional stop pin 27 on the outer wall of the air horn is engaged by lever 16 just as the choke valve is fully closed so that the actuation of lever 16 when the engine is not in operation, as in closing the choke for starting, does not affect the tension of spring 22.

Since the closing movement of the choke is effected through spring 22, the tension of this spring may not be sufficient to dislodge the choke in case it sticks in its wide open position. Accordingly, a second shoulder 28 is provided on lever 16 opposite to and radially spaced from shoulder 25. Second shoulder 28 is disposed so that just prior to engagement of stop 27 by lever 16, the shoulder will strike lip 21 to dislodge the choke and initiate its closing movement. The balance of the choke closing movement, of course, is effected through spring 22 in the normal manner.

Fast idle link 13 is controlled with manual lever 16 to provide normal and fast idling positions of the throttle, respectively, when the choke valve is fully opened and closed.

In operation, choke lever 16 will be fully rotated in its counterclockwise direction, to the position shown in Fig. 3, for cold starting. In this position, opening of the unbalanced choke valve is resisted by torsion spring 22. After the engine starts to run, the choke lever will be returned slowly to its full open position, as shown in Fig. 1, the choke valve, of course, also being moved to the full open position, but in the intermediate positions of the choke lever, being free to open farther under the influence of direct air flow, until it strikes stop 26. In case the choke valve should stick in its wide open position of Fig. 1, full counterclockwise rotation of choke lever 16 until it strikes stop pin 27, will cause shoulder 28 on the lever to initiate the choke closing movement, as indicated in Fig. 2. However, even

in this position of the choke lever, the choke valve is free to move substantially to its full open position.

Accordingly, means is provided for positively dislodging the choke in case of sticking without otherwise affecting the operation of the choke control. The invention may be modified in various respects as will occur to those skilled in the art and the exclusive use of all modifications as come within the scope of the appended claims is contemplated.

I claim:

1. In a carburetor having an air inlet, an unbalanced butterfly choke valve mounted on a shaft in said inlet, stop structure on the wall of said inlet limiting the opening and closing movements of said valve, a lever journaled about said shaft, a radial shoulder on said shaft adjacent said lever, a spring connecting said shaft and lever and normally holding said shaft shoulder against said lever so as to resist opening of said valve relative to said lever, and a stop limiting the valve closing movement of said lever to a position to just close said valve, said lever having a part disposed to forcefully strike said shaft shoulder in case of sticking of said valve to initiate the closing movement thereof, said striking part of said lever being arranged with respect to said shaft shoulder and said stop to permit unobstructed movement of said shaft and said choke valve to a substantially fully opened position regardless of the position of said lever.

2. In a carburetor having an air inlet, an unbalanced choke valve mounted on a shaft in said inlet, said shaft having a rigid radial projection, a lever journaled about said shaft and having a one-way connection therewith including said projection for joint opening movement of said valve and lever, a spring connecting said shaft and lever and resisting opening movement of said valve relative to said lever whereby closing of said valve is effected through said spring, stop structure on said inlet for determining the fully open and fully closed positions of said valve, and an additional stop on said inlet limiting the valve closing movement of said lever, said lever having a rigid part for striking said shaft portion just

prior to engagement of said additional stop by said lever, in case of sticking of said valve in wide open position, to initiate the closing movement of said valve, said striking part of said lever being arranged with respect to said shaft shoulder and said stop to permit unobstructed movement of said shaft and said choke valve to a substantially fully opened position regardless of the position of said lever.

3. In a carburetor having an air inlet, an unbalanced butterfly choke valve mounted on a shaft journaled in the walls of said inlet, a lever journaled about said shaft outside said inlet, said lever having first and second radially spaced shoulders, a projection on said shaft between said shoulders, a spring connecting said shaft and lever and normally maintaining said projection in engagement with said first shoulder so as to yieldingly resist opening movement of said valve relative to said lever, stop structure on the wall of said inlet limiting the fully open and fully closed positions of said valve and also limiting the closing movement of said lever, the closing movement of said valve normally being effected through said spring and said second shoulder on said lever being disposed to strike said shaft projection as said lever approaches said last mentioned stop to initiate closing movement of said valve in case of sticking thereof in wide open position, said second shoulder being arranged with respect to said shaft shoulder and said stop structure to permit unobstructed movement of said shaft and said choke valve to a substantially fully opened position regardless of the position of said lever.

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