

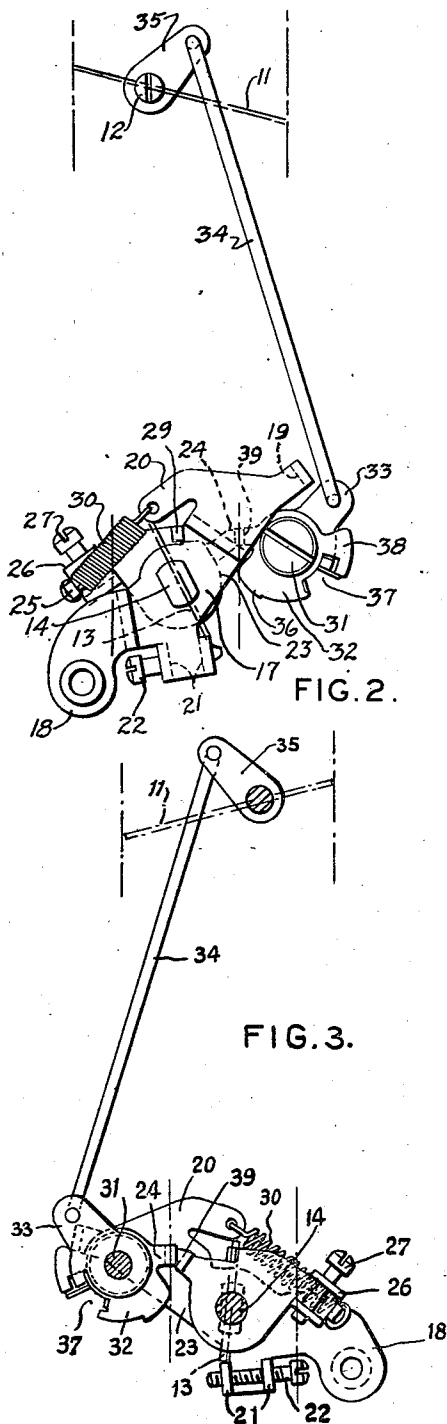
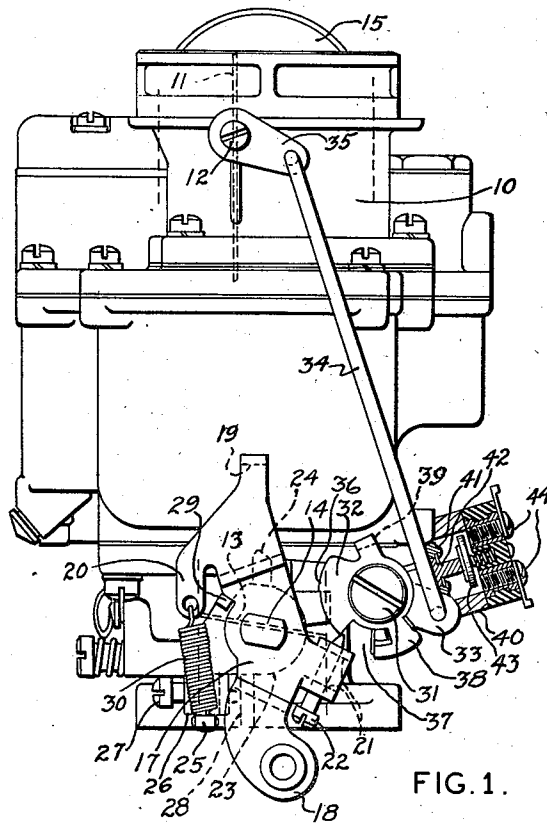
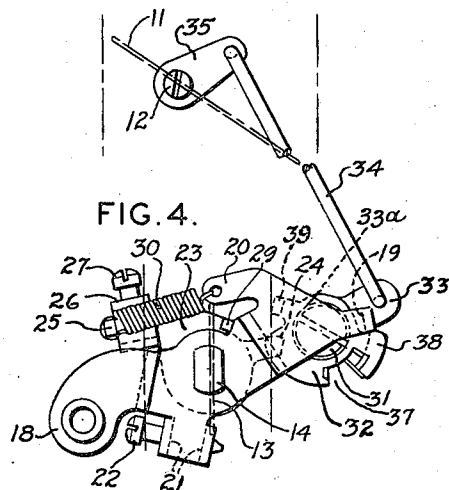
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CARBURETOR DELOADER

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CARBURETOR DELOADER

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7 Claims. (Cl. 261—52)

This invention relates to automatic choke carburetors for internal combustion engines and consists particularly in novel means for indicating the functioning or impending functioning of the usual "unloading" mechanism responsive to opening movement of the throttle for opening the choke valve, and for rendering the indicating means inoperative by continued throttle opening movement.

In a co-pending application, Serial No. 347,415, filed July 25, 1940, in the name of Irven E. Coffey there is disclosed and claimed mechanism for applying sensible additional resistance to opening movement of the throttle at or just prior to the point where such movement is effective to open the choke valve during cranking for "unloading" purposes. This mechanism includes inclined plane structure which functions by camming action to render the additional resistance ineffective before the throttle is fully opened so that the driver need not continuously oppose the force of this additional resistance during "unloading." This structure has a disadvantage in that substantial forces are built up between the inclined plane parts, and these parts, if not especially tempered, are subject to excessive wear.

It is an object of the present invention to provide means for interposing sensible additional resistance to "unloading" movement of the throttle valve, together with means to positively avoid the resistance, without the use of the camming or wedging action relied upon in the above-mentioned application.

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

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

Fig. 2 is a similar view showing certain operative parts thereof, but with the choke valve closed and the throttle valve partly opened.

Fig. 3 is a view similar to Fig. 2 but showing the choke valve closed and the throttle valve just on the point of opening the choke for "unloading."

Fig. 4 is a view similar to Figs. 2 and 3 but showing the choke and throttle valves in the unloading position.

The carburetor in Fig. 1 includes a barrel 10 forming a downdraft mixture conduit and provided with an unbalanced choke valve 11 mounted on a shaft 12 journaled in the upper part of the mixture conduit wall, and a butterfly throttle valve 13 mounted on a shaft 14 journaled in the

lower part of the mixture conduit wall. A housing 15 mounted adjacent the choke valve 11 encloses suitable automatic choke mechanism such, for instance, as disclosed and claimed in Coffey Patent #2,085,351, for yieldingly closing the choke valve during cold starting.

A crank 17 is rigidly attached to throttle shaft 14 on the outside of the mixture conduit and has an apertured extension 18 at one end, for connection to suitable manual control mechanism, and has an inwardly projecting lug 19 at the opposite end. The intermediate portion of the crank is provided on one side with an apertured arm 20 and, on the other with inwardly projecting spaced lips 21 threadedly receiving a fast idle screw 22. Rotatably mounted on shaft 14 inside crank 17 is a plate element 23 having a projecting finger 24 at one side thereof and an outwardly projecting lug 25 at the opposite side. The plate element also has inwardly projecting lips 26 adjacent lug 25 mounting a screw 27 for engaging a rib 28 projecting from the carburetor barrel for adjusting the normal idling position of the throttle valve. Rib 28 does not interfere with throttle crank 17. Projecting outwardly from the plate element between lug 25 and finger 24 is a second lug 29 which overlaps or extends into the path of movement of crank 17 so as to limit the clockwise movement of the plate element relative to the crank, as shown in Fig. 1. A coiled spring 30 connects lug 25 on the plate element and arm 20 on the control crank for normally maintaining the plate element and crank in the position of Fig. 1.

Rotatably mounted on a pintle 31 adjacent the throttle valve is a fast-idle cam element 32 and an arm 33 yieldingly connected by torsion spring 33a for clockwise movement of the latter relative to the former. Arm 33 is connected to the choke for movement therewith by a link 34, and a second arm 35 rigid with the choke shaft. When the choke is closed, the cam element is positioned, as in Figs. 2 and 3, so that a high portion 36 thereof will be engaged by screw 22 carried by manual control arm 17 to limit the closing movement of the throttle valve to a fast idle position. When the choke valve is fully open, as in Fig. 1 a recessed portion 37 is opposite screw 22 to permit the previously mentioned screw 22 carried by plate element 17 to engage rib 28 in the normal idling position of the throttle. Cam element 32 has a radial projection 38 for engagement by lug 19 on the throttle crank to "unload" the carburetor and intake system, and a second projection or finger 39.

Projecting from the carburetor barrel adjacent the throttle valve is an inclined casing 40 which slidably receives a plunger indicated at 41, this plunger in turn telescopically receiving an inner plunger 42 to which is secured the switch blade 43. Switch contacts 44 are adapted to be connected in the starter motor circuit and outer plunger 41 is actuated by partial opening movement of the throttle valve to close the switch for energizing the starter circuit, as fully described and claimed in Patent No. 2,174,313, issued to Irven E. Coffey.

The operation of the mechanism is as follows:

During clockwise movement of manual control crank 17 between the positions shown in Fig. 1 and Fig. 2, the crank and plate element 23 move as a unit with throttle valve 13. Assuming that the choke valve is closed, as in Fig. 2, cam element 32 is so positioned that the end of projection 37 thereon is engaged by the end of finger 24 on plate element 19, when the throttle has been opened to the position shown in Fig. 2. This stops the rotation of the plate element, and, thereafter, continued opening movement of the throttle tensions coiled spring 30. Upon still further opening movement of the throttle, inwardly projecting lug 19 on crank 17 engages a projection 38 on cam element 32 and positively rotates the cam element in a clockwise direction, as indicated in Fig. 4, so as to release finger 24 and thus avoid the additional resistance due to tensioning of spring 30. This movement of the plate element also partly opens the choke valve through link 34 and arm 35.

The position of the throttle valve, as shown in Fig. 2 where the tensioning of spring 30 has just begun, is a more open position than that necessary to close starter switch elements 43 and 44 so that the additional resistance applied due to tensioning of the spring effectively indicates to the driver the proper starting position of the throttle and avoids the possibility of his inadvertently opening the throttle far enough to open the choke. Moreover, when the choke valve is actually in its "unloading" position, as in Fig. 4, the additional resistance has been relieved through the positive action of lug 19 against the cam element.

The invention may be modified in various respects 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 a carburetor, choke and throttle valves, yielding means to close said choke valve for cold starting, a member connected to said throttle for movement therewith, a second member movably mounted relative to said first means, a spring connecting said members for effecting joint movement thereof, a device movable to an operative position by closing of said choke valve to interfere with movement of said second member so as to tension said spring and apply sensible resistance to opening of said throttle valve, means operable upon continued opening movement of said throttle valve to positively move said first member to an inoperative position to avoid said additional resistance, and mechanism operable by opening movement of said throttle valve after tensioning of said spring to open said choke valve against said yielding means.

2. In a carburetor, choke and throttle valves, yielding means to close said choke valve for cold starting, a device movable to an operative position

by closing of said choke valve, a member movable with said throttle valve, a second member movably mounted relative to said first member, a spring connecting said members for joint movement of said members, said second member being disposed to engage said device when in said operative position to tension said spring and apply sensible resistance to continued opening of said throttle valve, said first member being constructed and arranged to engage and move said device away from said operative position after tensioning of said spring to avoid said additional resistance, and mechanism connecting said device and said choke valve for opening said choke valve when said device is moved by said first member.

3. In a carburetor, choke and throttle valves, yielding means to close said choke valve for starting, a member positively movable by opening of said throttle, a second member movably mounted relative to said first member, a spring between said members, and a device connected to said choke valve for movement thereby to an operative position, said device when in said position interfering with movement of said second member in the throttle opening direction so as to tension said spring and apply sensible resistance to further throttle opening movement, said first member being constructed and arranged to engage said device after tensioning of said spring to force said device to a different position for releasing said second member and opening said choke valve against said yielding means.

4. In a carburetor, choke and throttle valves, yielding means to close said choke valve for cold starting, a pivoted member connected for positive movement with said throttle valve during opening thereof, a second member rotatably mounted relative to said first member, a spring connecting said members for joint rotation thereof, a third pivoted member connected to said choke valve and movable therewith to an operative position to interfere with movement of said second member so as to tension said spring and apply sensible resistance to throttle opening movement, and structure positively movable during opening of said throttle valve to move said third member so as to release said second member therefrom and open said choke valve.

5. In a carburetor, choke and throttle valves, a throttle shaft, a throttle lever fixed to said throttle shaft, a member rotatably mounted on said throttle shaft including a projecting finger, a spring connecting said throttle lever and said rotatable member for normally effecting joint movement thereof, a device movable to operative position by closing of said choke valve to engage the projecting finger of said rotatable member to restrain movement of same to cause said spring to resist further movement of said throttle lever whereby sensible resistance is applied to further opening of said throttle to indicate movement beyond starting position, and means carried by said throttle lever to move said device from engagement with said finger to eliminate further spring resistance to continued throttle movement.

6. In a carburetor, choke and throttle valves, a throttle shaft, a throttle lever fixed to the throttle shaft, an idle stop carried by said lever, a member rotatably mounted on said throttle shaft including a projecting finger, a spring connecting said throttle lever and said rotatable member for normally effecting joint movement therebetween, an idle cam for engaging said idle stop, a member movable with said idle cam by

closing movement of said choke to engage the projecting finger of said rotatable member to restrain movement of same to cause said spring to resist continued movement of the throttle lever for applying sensible resistance to indicate movement of said throttle beyond starting position, and means carried by the throttle lever to release said finger from the rotatable member to eliminate further spring resistance to continued throttle movement.

7. In a carburetor, choke and throttle valves, a throttle shaft, a throttle lever fixed to the throttle shaft, an idle stop carried by said lever, a member rotatably mounted on said throttle shaft, a spring connecting said throttle lever and said rotatable member for effecting joint

movement therebetween, an idle cam for engaging said idle stop, an operative connection between said choke valve and said idle cam whereby movement of said cam will operate said choke valve, a member movable with said idle cam and shiftable by closing movement of said choke to permit same to engage said rotatable member to restrain movement thereof to cause said spring to resist movement of said throttle lever beyond a predetermined position, means carried by the throttle lever to release said rotatable member from engagement with said idle stop to eliminate further spring resistance to continued throttle movement.

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