

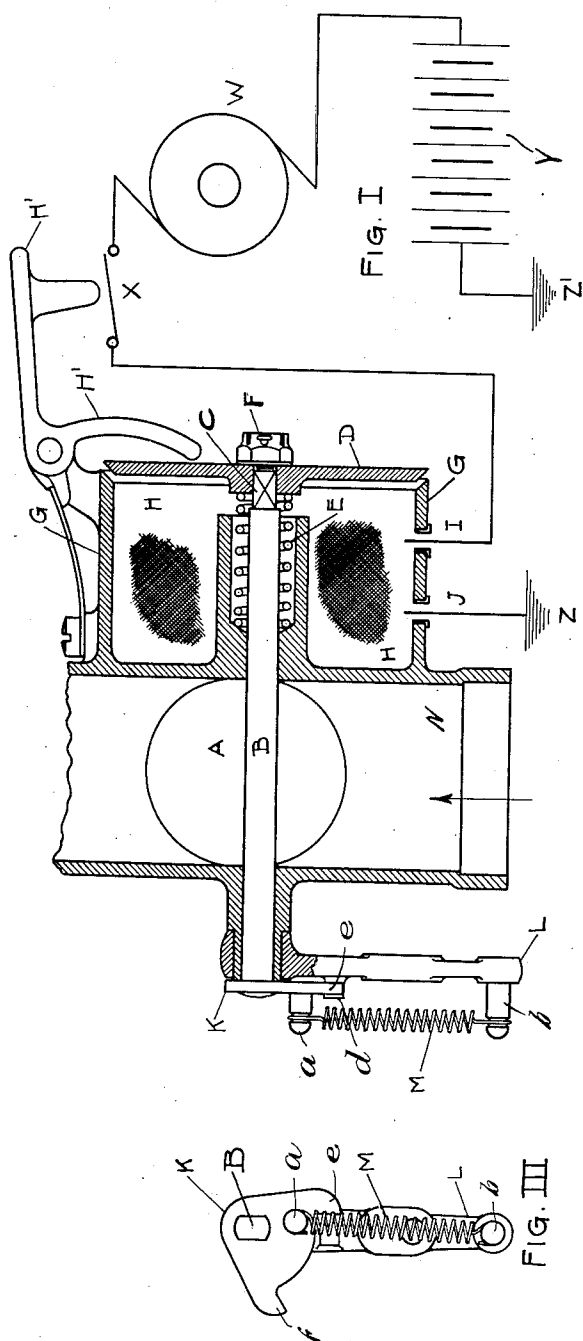
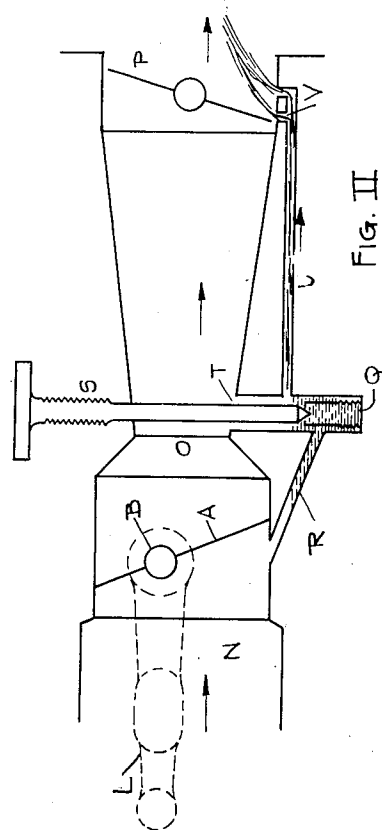
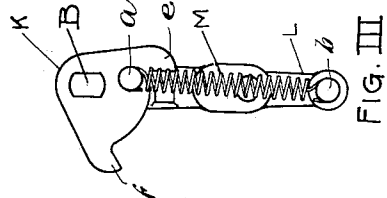
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E. HOLLEY

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CARBURETOR CHOKE VALVE CONTROL

Filed Jan. 12, 1922



*E. Holley*  
INVENTOR.

## UNITED STATES PATENT OFFICE.

EARL HOLLEY, OF DETROIT, MICHIGAN.

CARBURETOR CHOKE-VALVE CONTROL.

Application filed January 12, 1922. Serial No. 528,882.

*To all whom it may concern:*

Be it known that I, EARL HOLLEY, a citizen of the United States, residing at 2253 Burns Avenue, Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Carburetor Choke-Valve Controls, of which the following is a specification.

This invention relates to a new and useful carburetor choke valve control of which the following is a description of the preferred construction, reference being had to the drawings as follows:—

Figure I shows the general scheme of operation, the electrical connections being shown diagrammatically.

Figure II shows diagrammatically the type of choke valve referred to.

Figure III shows in detail the manual control of the choke valve.

Like letters correspond to similar parts in all the figures.

The purpose of the invention is to eliminate the following difficulty experienced with existing choke valve control.

If the choke valve spring be sufficiently stiff so that within the available arc of movement (110°) the choke valve may be moved from full open position to the closed position necessary for starting in cold weather with an electric starter, the available range for driving away is only a relatively small angular movement and the adjustment is correspondingly coarse.

With the proposed means, the full swing of the control lever for the choke valve is available.

Another difficulty experienced with existing choke valve control is the fact that the right adjustment of the tension in the automatic choke valve for driving away will not give a sufficiently rich mixture for starting, the driver having to change the choke valve adjustment the moment the engine fires.

If the choke is interconnected with the switch of the starting motor so that the choke valve is closed regardless of manual adjustment of the choke valve, an excessively rich mixture will be given the motor at all times. When restarting a hot motor, after stalling in traffic, the engine would thereupon be choked with excess fuel and a complete engine failure would result. This serious difficulty is avoided by the invention described herein.

*Description:* Figure I shows all the essential elements of this invention. A is the choke valve; B is the shaft upon which the choke valve is eccentrically mounted; C is a squared portion at the end of B; D is a disk engaging with the squared portion C; E is a light spring which slides the disk D along the end of C which is threaded and provided with a nut and washer F; G is a cup shaped piece which has a tapered seat for the disk D and is secured to the carburetor body; the annular space between the spring E and the walls C is occupied by an electric coil H; this coil has two connections I and J, or of course it may be grounded when only one connection is required. However, it is preferable not to ground at this point owing to the proximity of the gasoline vapors. On the other end of the shaft B is a stamping K which is controlled by a lever L, to which it is connected by the spring M by the following means. The projecting pin *a* shown in Figures I and III is mounted on the stamping K and a corresponding pin *b* is mounted on the lever L, the spring M being in tension between the two pins *a* and *b*. *a* is slightly off center with reference to the pin *b* and the throttle shaft B so that the tendency of the spring M is to rotate the shaft B in a clockwise direction so as to draw the eccentric valve A into the open position.

The lever L is also provided with a stop *d* which contacts with the corresponding stop *e* of the stamping *k* so that the throttle valve *a*, throttle shaft B, stamping K, and lever L move together, the stops *d* and *e* being held in contact with each other by the tension of the spring M. Another stop *f*, corresponding to the stop *e*, is provided on the stamping K, which stop is adapted to contact with the stop *d* when the lever L moves 60° in a clockwise direction with reference to the throttle valve A, throttle rod B, and stamping K. When in this latter position the spring M is obviously extended so as to exert its maximum torque on the throttle shaft B. This torque is balanced by the action of the air flow upon the throttle valve A (eccentrically mounted on the throttle rod B), this action tending to rotate the valve A against the action of the spring M. W is the starting motor; X is the starting switch; Y is the storage battery; Z and Z' are the ground connections. H' is a bell crank lever operated simulta-

neously with the starting switch X as an alternative to the electro-magnet GH.

Referring to Figure II, A is the choke valve; N is the air entrance; O is the choke tube; P is the main throttle; Q is the fuel nozzle; R is the air vent; S is the needle; T is the main fuel outlet; U is the low speed tube; V is the low speed outlet.

Figure III is merely a side elevation of lever L, spring M, and stamping K.

*Operation:* The normal operation of the choke valve A and the choke lever L is as follows:

When the engine has been running for some considerable time and is therefore warm the choke valve A is in its wide open position, as shown in Figures I and III, and the entire mechanism is inoperative. When running with a cold engine the choke valve A is closed by moving the choke lever L 70° (see Figure III) in a clockwise direction. This causes the choke valve A to just close the air entrance N and to exert a slight pressure on the walls of the air entrance. In very cold weather the lever L is moved an additional 60° in a clockwise direction, thereby causing the stop *d* of the lever L to contact with the stop *f* of the stamping K and thereby positively lock the choke valve A and thus effectively seal the air entrance N.

Obviously in these two extreme positions, namely the position shown in Figures I and III and the position described above in which the stop *d* contacts with the stop *f* there is no need of any auxiliary device for controlling the choke valve A; but in the intermediate positions, that is to say when the choke valve A is closed but the spring M is not fully extended, it is desirable to prevent the opening of the choke valve A when the electrical starting motor is slowly cranking the engine. In other words it is desirable to adjust the lever L into the position at which the car may be operated immediately following the initial explosions. Now, obviously after the engine has once begun to fire considerably more air must be taken in than can be admitted during the starting operation, and it is to prevent the need for changing the adjustment of the lever L at this critical moment immediately after the starting operation that this invention has been devised.

When the starting motor is operated and the starting switch depressed, the electro-magnet GH is energized by the electric current flowing from I to J. The piece D, which is of soft iron, is thereby drawn by magnetic force on the seat of the mouth of the annular bowl G. The shaft B is thereby

locked in position and the full suction of the engine acts on the fuel nozzle Q and the vent R (Fig. II). On releasing the starting motor the valve A is restored to its normal position, as determined by the manually controllable lever L which is connected to the choke valve rod B through the spring M and the piece K, which is riveted to the end of the shaft B. When the electro-magnet G is not used the lever H' may be arranged to serve the same purpose, that is to lock the spring controlled choke valve whilst the starting motor circuit is closed. When the engine to which the device is attached is hot, choking is neither needed nor desirable, and then it is possible, by manually opening the valve A, to lock the valve A in the open position and thereby avoid drawing in an excessive quantity of fuel as would result if the valve A was always closed whenever the electric current was closed by X and the starting motor put in operation.

When the bell crank lever H' is used the same results are secured as when the electro-magnet GH is used, but, of course, the controls are more complicated as the carburetor is located some distance away from the foot control of the starting switch.

With either construction the flexible air valve A is locked in position wherever it may be, when the starting motor is in operation.

Figure II shows the choke valve in the closed position and the throttle valve in the idling position. Obviously when it is desired to start the engine the throttle valve P must be opened at least 30° in which case the fuel issues directly into the Venturi tube O and not into the low speed bypass U. The position of the part shown, therefore, corresponds to low speed operation with a cold engine.

What I claim is:

The combination of an internal combustion engine having electric starting means controlled by a switch, a carburetor, priming means for said carburetor comprising an automatic air valve responsive to the engine suction and located between said carburetor and the atmosphere, manual means for adjusting said air valve, common means for energizing the electric starting means and locking said air valve, whereby the priming means may be rendered either operative or inoperative to any desired degree as determined by the manual adjustment of said air valve.

In testimony whereof I affix my signature.

EARL HOLLEY.