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CLUTCH CONTROL

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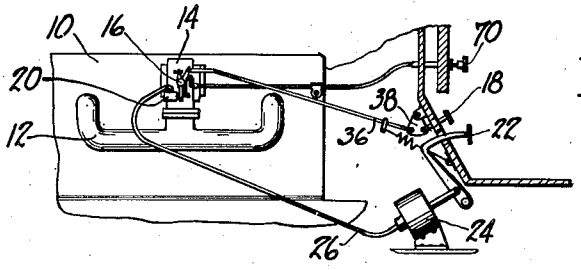
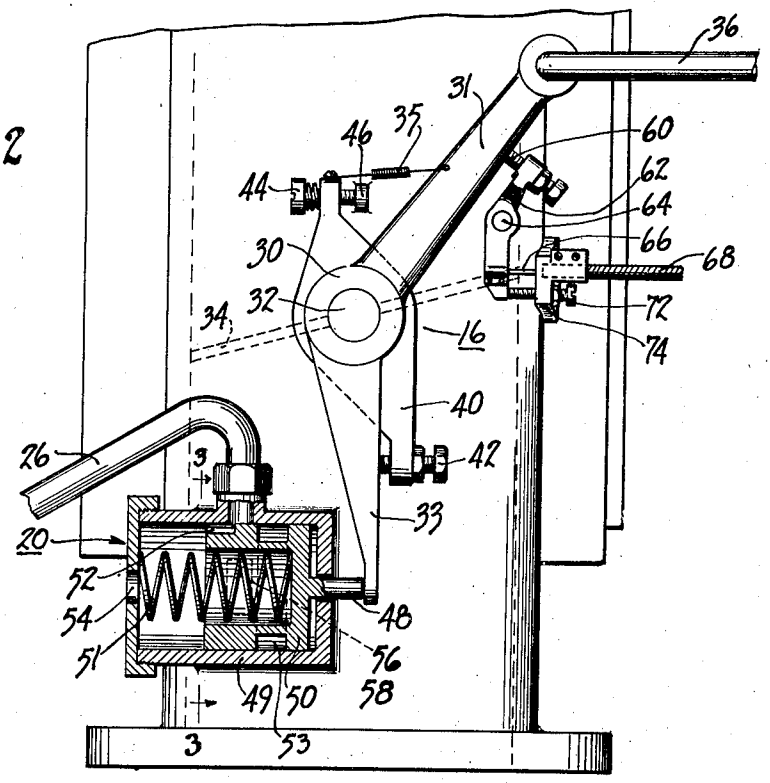



Fig. 1

Fig. 2



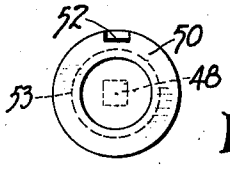




Fig. 3

INVENTOR.
Scott F. Hunt

BY

ATTORNEY.

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## CLUTCH CONTROL

Scott F. Hunt, South Bend, Ind., assignor to Bendix Aviation Corporation, South Bend, Ind., a corporation of Delaware

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8 Claims. (Cl. 192—.01)

This invention relates to control mechanism for automotive vehicles and more particularly to the automatic control of various parts such as the clutch, the operation of which may be controlled automatically from the operation of the throttle valve.

In automotive vehicles, when the throttle is open, it is desirable that the clutch be engaged, so that the clutch is ordinarily disengaged only at such times as the throttle is closed. Disengagement of the clutch at every closing of the throttle, however, is not desirable since the motor is often used as a brake as in descending long grades with closed throttle.

It is, accordingly, an object of this invention to provide mechanism closely associated with a carburetor throttle valve for operating the control mechanism of an automatic clutch, together with means for restricting such operation readily and at will.

Another object is the provision of a simplified compact, unitary mechanism for controlling a power actuated clutch by the throttle valve, together with mechanism adapted to restrict the operation of the controlling mechanism at will.

The above and other novel features of the invention will appear more fully hereinafter from the following detailed description when taken in connection with the accompanying drawing. It is expressly understood, however, that the drawing is employed for purposes of illustration only and is not designed as a definition of the limits of the invention, reference being had for this purpose to the appended claims.

In the drawing, wherein similar reference characters refer to similar parts throughout the several views:

Figure 1 is a diagrammatic view of a carburetor having a throttle valve therein, an automatically operated clutch, and control mechanism for the carburetor and clutch;

Figure 2 is an enlarged side elevation of the carburetor of Figure 1, showing the associated clutch control valve in section;

Figure 3 is a section taken through Figure 2 on the line 3—3, illustrating the shape of the valve member.

Referring to the drawing, and more particularly to Figure 1, there is shown diagrammatically an internal combustion engine 10 such as used in automotive vehicles, an intake manifold 12 and down draft carburetor 14, together with the throttle valve mechanism 16 and foot or accelerator pedal 18 suitably connected for operating the same. As shown, the clutch is adapted to be operated by a vacuum power cylinder 24 connected by a suction conduit 26 to a valve 20, which in the modification shown is mounted directly upon the carburetor.

Referring to the carburetor throttle valve and the clutch control valve 20, and their associated operating mechanism which are shown in detail in Figure 2, it will be observed that the bent lever 30 is adapted to be actuated by the accelerator pedal 18 through the bell crank 38 and connecting link 36. The throttle valve comprising a disc 34 securely fixed to a shaft 32 is adapted to be actuated by the crank member 40 which is securely fixed to the shaft 32, and the bent lever 30, which is freely pivoted thereon; transfer of motion from the bent lever to the crank 40 being accomplished through the intermediary of the adjusting screw 42 and arm 33 of the lever. To adjustably fix the closed position of the throttle valve, and also to urge the same to closed position, since the lever 30 may carry the valve to open position only, an adjusting screw 44 secured in the opposite end of the crank 40 is adapted to engage a fixed stop 46, and to be resiliently urged into such engagement by a suitable spring such as 35, connected between the crank 40 and lever arm 31. During such time as the throttle valve is opened the spring 35 urges the crank adjustment screw 42 into engagement with the lever arm 33, thereby causing the throttle to follow movement of the lever 30, throughout its opening and closing range.

The clutch control valve 20 may be located as shown in Figure 2 so as to be conveniently operated by the extremity of the lever arm 33 and to directly connect to the manifold. The cylindrical valve casing 49 is provided with a piston type of valve member 50, having a shank 48 leading outside the casing 49 into engagement with the arm 33. The spring 51 normally urges the valve member 50 to the right to the position shown, where conduit 26 is connected to atmosphere through the groove or notch 52 in the valve member and the exhaust aperture 54 located in the end of the cylinder. To connect the conduit 26 with the manifold vacuum, the annular groove 53 in the valve member is adapted, upon movement to the left, to connect the port 56 which leads preferably directly into the carburetor with the conduit 26 thereby affording a direct connection between the intake manifold and suction motor 24. As shown in Figure 3, the shank 48 may be square so as to prevent rotation of the valve member, and thus prevent the groove or

notch 52 from shifting from its proper position with respect to the inlet of conduit 26 and prevent the connection of the port 56 to atmosphere.

Since it is preferable that some means be provided for the purpose of preventing, at will, the normal operation of the valve 20 and clutch control, as would be desirable where "free wheeling" is objectionable, as in descending long grades in gear, there is provided a manually adjustable stop comprising a lever 62 suitably pivoted as at 64 to the carburetor casing adjacent the lever 30. The lever at one end carries an adjustable abutment 60 adapted to engage the lever arm 31 as a stop while the other end is secured to the end of a flexible control cable 66 passing through the conduit 68 to a manual control knob 70 located on the dash, as shown in Figure 1. To provide a support for the end of the conduit 68 and also for an adjustable abutment to prevent over-operating the stop lever 62, which would result in preventing complete closure of the throttle, the bracket 74 is provided adjacent the lever 60 in which is clamped the conduit 68 and in which the threaded adjustment screw 72 is located.

In operation, it will be readily seen that the lever 30, when rotated in a counterclockwise direction from the closed throttle position, will engage the adjustment screw 42 and rotate the crank 40 thereby opening the throttle. Reverse movement of the lever 30 will tend to close the throttle by reason of the spring 35 urging the crank 40 in a clockwise direction. The closing movement of the throttle is limited by the adjustment screw 44 striking the abutment 46 which may be suitably adjusted to prevent complete closure of the throttle valve for any desired closed throttle adjustment. Movement of the lever 30 from closed throttle position in a clockwise direction thereupon tensions the spring 35 closing the throttle valve 34 and actuates the valve member 50 to the left against the pressure of spring 51 and in turn connects the port 56 with the conduit 26 thereby connecting the carburetor intake to the suction motor 20 and actuating the clutch. This latter movement of the lever 30 and valve member 50 may be prevented by placing the stop screw 60 on the lever 62 in the position shown in Figure 2. This is accomplished through movement of the dash control button 70 to tension the cable 66 and draw the lever 62 into engagement with the adjustment screw stop 72.

There is thus provided a novel, compact and unitary mechanism adapted to control or operate the throttle valve and adapted to operate the control valve for a clutch control mechanism in sequence together with mechanism for preventing the operation of the clutch control valve at will.

Though only one embodiment and modification of the invention has been illustrated and described, it is to be understood that the invention is not limited thereto but may be embodied in various mechanical or even electrical forms. As such changes in construction and arrangement of parts may be made without departing from the spirit of the invention, as will be apparent to those skilled in the art, reference will be had to the appended claims for a definition of the limits of the invention.

I claim:

1. In a carburetor, the combination of a casing having a channel for combustible mixtures, a throttle valve therein, a two way valve adapted to be connected to a vacuum motor secured to said casing and having one of said ways leading into said channel, a shaft for said throttle valve leading outside said casing, a stop for limiting the closed movement of said throttle valve and shaft, means rotatably mounted on said shaft having a lost motion connection with said throttle valve in one direction of rotation, and a lost motion connection with said two way valve in the other direction of rotation, and controllable means for arresting movement of said means when rotating in the other direction to prevent actuation of said two way valve.

2. In combination with an intake manifold, a throttle valve, a two way valve secured to said manifold and having a port communicating with said manifold, means for operating said valves having a lost motion connection with said throttle valve when actuated in one direction and having a lost motion connection with said two way valve when operated in the other, and controllable means associated therewith for preventing lost motion in the connection with said throttle valve.

3. In combination with an intake manifold, a throttle valve, means for actuating said valve to an open position, means for causing said valve to follow said actuating means to closed position, said actuating means having lost motion movement with respect to said throttle valve, a second valve communicating with said manifold and operable by the lost motion movement of said actuating means with respect to said throttle valve and controllable means for limiting the movement of said actuating means beyond the closing of said throttle valve.

4. In an automotive vehicle vacuum clutch control system, a carburetor having an intake manifold, a throttle valve for said manifold, actuating means having a lost motion connection with said throttle valve, a vacuum cylinder control valve secured to said carburetor having a port directly connected with said manifold, said control valve having a lost motion connection with said actuating means, and adapted for actuation with said throttle valve in sequence, and means on said carburetor for preventing operation of said control valve.

5. In a carburetor, a throttle valve, a shaft therefor, means on said shaft for limiting closing movement of said valve, a lever pivoted on said shaft and engaging a shoulder on said means so that movement of said lever may open said throttle, a manually controllable stop means for limiting at will the movement of said lever beyond closed throttle position, and a second control mechanism located on said carburetor and adapted to be operated by movement of said lever beyond closed throttle position.

6. In a carburetor, a throttle valve comprising a valve disc and operating shaft, an operating lever pivoted on said shaft, and means secured to said shaft and engaging said lever for opening said throttle valve upon opening movement of said lever, means urging said throttle valve to closed position, independent means for controlling movement of said lever beyond closed throttle position, and a control mechanism operative by movement of said lever beyond the closed throttle position.

7. In a carburetor, a throttle valve comprising a valve disc and shaft, a lever pivoted on said shaft and adapted to carry said valve to open position, means urging said valve to closed position, a manually movable stop for said lever

adapted to predetermine its movement beyond closed throttle position, and control means operated by said lever movement beyond closed throttle position.

8. In a carburetor, a throttle valve, a lever having a lost motion connection with said valve for opening said valve, stop means adapted to limit the lost motion movement of said lever while the throttle is closed, means to shift the stop, and means for limiting the shifting of the stop so that said stop may not be shifted to prevent closing of said throttle.

SCOTT F. HUNT.