

# UNITED STATES PATENT OFFICE

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## CARBURETOR

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This invention relates to new and useful improvements in controlling devices, and particularly to carburetors for internal combustion engines.

5 One object of the invention is to provide a carburetor, including a throttle valve, in which the proportion of gasoline is increased and diminished in proper ratio to the volume of air flowing through the throttle valve.

10 Another object is to provide a throttle valve and needle valve, arranged to move in unison, whereby to properly proportion the air and gasoline, such throttle valve having means for moving the same in a direction to raise and lower the needle valve, such means being regulatable to increase or decrease the said movement.

15 A further object is to provide a throttle valve which is so constructed that it automatically seats itself, whereby to properly compensate for wear of the valve and seat, and thereby provide a non-leaking fit between the valve and seat.

20 Other objects and advantages will be apparent from the following description when taken in connection with the accompanying drawing.

In the drawing:

25 Figure 1 is a vertical sectional view through a carburetor made in accordance with the present invention, the interior parts being in elevation.

30 Figure 2 is a vertical sectional view, similar to Figure 1, but showing the interior parts in section.

35 Figure 3 is a vertical sectional view on the line 3—3 or Figure 1.

40 Referring particularly to the accompanying drawing, there is shown a cruciform member which includes the central vertical portion 10, from the opposite sides of which extend the branches 11 and 12, the former being formed for connection with an intake manifold, while the latter is adapted to receive atmospheric air. The lower end of the vertical portion is formed with a bottom wall 13, through the center of which is disposed the vertical stem 14, having the longitudinal bore 15, a portion of said stem extending above the wall, within the said mem-

ber, while the lower portion extends below the wall and is externally threaded to receive thereon the vertical cylindrical member 16. This member 16 has a head on its lower end, and is disposed upwardly through the cup or gasoline float chamber 17, whereby to securely hold said chamber in position. In one side of the member 16 is an opening 18, through which gasoline enters, from the said chamber, such gasoline being drawn upwardly through the bore 15, to the jet 15', and thence into the mixing chamber 19.

Rotatable within the mixing chamber 19 is the cylindrical valve body 20, the same being hollow and open at its lower end to receive the upper end portion of the stem 14. The valve body 20 is longitudinally split, on one side, as shown at 21, the upper portion of said body being solid, as indicated by the numeral 22. At diametrically opposite points in the wall of the throttle valve body 20 are the ports 20', which are adapted to register with the branches 11 and 12, to permit passage of atmospheric air from the branch 12 to pass over the gasoline jet 15', to become carbureted and flow to the engine through the branch 11. Formed circumferentially in the outer face of this solid portion is a groove 23, and formed in said portion, above and below the groove, respectively, are the cuts 24 and 25, both of which extend circumferentially for a distance slightly greater than one-third of the circumference thereof. Corresponding ends of these cuts lie in the longitudinal split of the valve body, as clearly seen in the drawing. Threaded downwardly through the upper end of the valve body is a screw 26, the lower end of which bears on the upper face of the free end of the flexible groove carrying portion 27, which is partially separated from said body by the cuts 24 and 25, and the split 21, such screw when rotated forwardly, being adapted to flex such portion inwardly for the purpose of disposing the free end thereof out of alinement with the adjacent end of the groove at the other side of the split, with the result that such flexible portion is in the position and form of a cam. Upon rotation of the screw 26, in a retrograde direction, the natural, inherent flexibility of said portion

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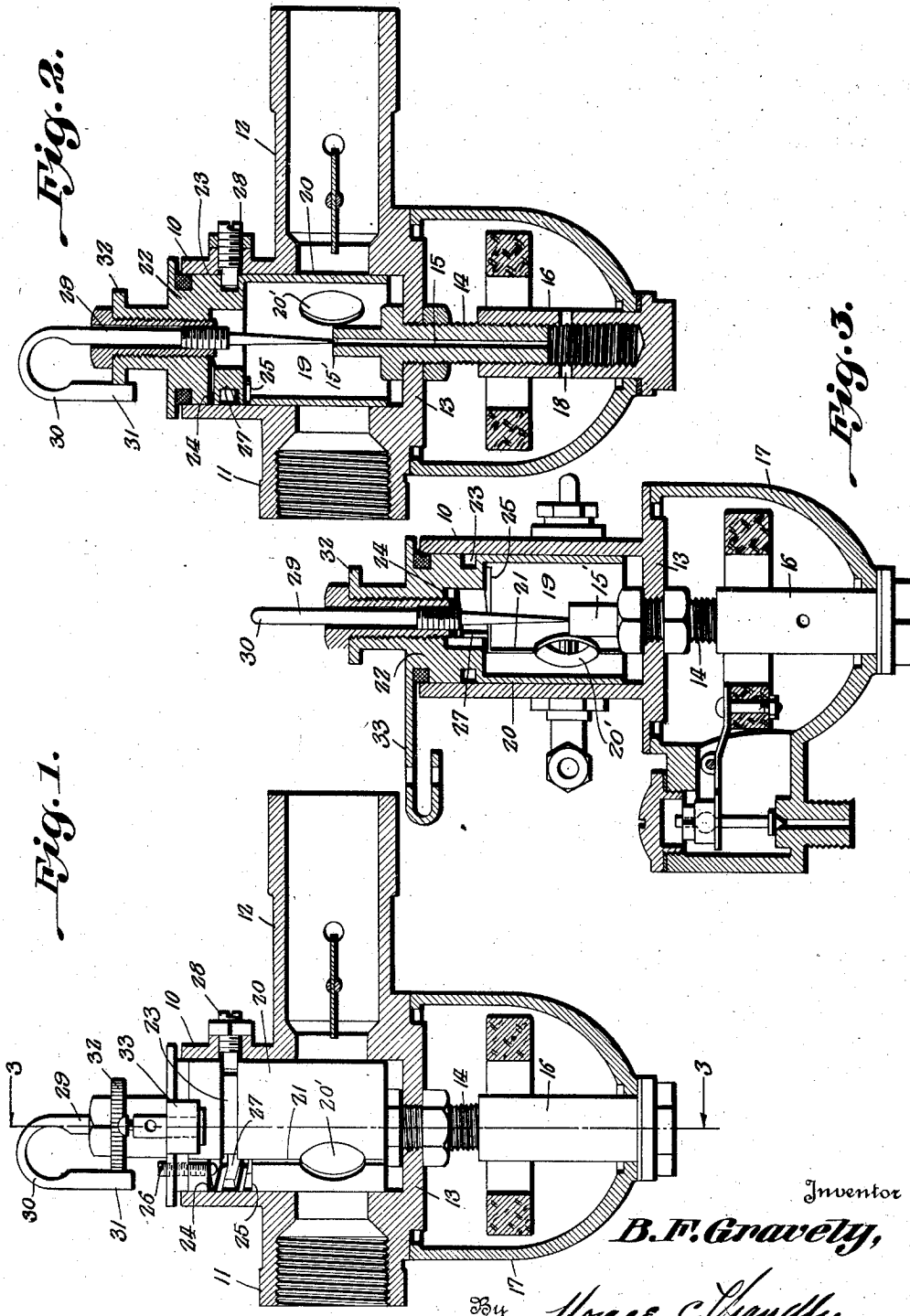


Fig. 1.

Fig. 2.

Fig. 3.

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27 will cause said portion to spring outwardly toward its normal position. Thus the portion 27 is adjustable to vary the inclination of the groove 23, and thereby the longitudinal movement of the throttle valve body 20. 5 Threaded into one side of the vertical member 10 is a screw 28, the inner end of which is disposed within the groove 23, whereby when the valve body is rotated said screw will 10 cause the said body to move vertically within the mixing chamber, when said screw end engages within the portion of the groove in the flexible portion 27. Threaded downwardly through the center of the valve body 15 is the needle valve 29, the lower end of which lies within the upper end of the bore 15, of the stem 14. The upper end of the needle valve is provided with a fingerpiece 30, by means of which the valve may be rotated for 20 vertical adjustment, said fingerpiece having a flexible pawl portion 31 which engages with the circular toothed member 32, whereby said needle valve may be held at any point in its adjustment.

25 From the foregoing it will be seen that, upon rotation of the needle valve such valve will be moved upwardly or downwardly, within the upper end of the bore 15, whereby to regulate the flow of gasoline flowing from 30 said end of the bore. As the air is drawn through the valve 20, such air passes over the upper end of the stem 14, and draws thereinto, and mixes therewith, a portion of the gasoline in the upper end of the bore 15. This 35 mixture is drawn into the engine, through the intake manifold, not shown, but which will be understood.

The upper end of the valve 20 is provided with a laterally extending arm 33, which is 40 adapted to be connected with a suitable control device. As the valve is rotated, the same is moved longitudinally within the mixing chamber, so that the needle valve will be raised or lowered within the bore 15, thereby 45 maintaining the same proportion of gasoline drawn from the said bore, to the amount of air drawn through the valve. Thus, as the valve 20 is rotated to decrease the amount of air passing through the branches 11 and 50 12, the needle valve will move down into the bore 15, whereby to decrease the amount of gasoline, in the same ratio to that of the reduction of the air, thereby maintaining the air and gasoline at the same proportions, during 55 the acceleration or reduction of the flow of mixture to the engine.

Attention is also called to the automatic seating of the valve in the chamber, due to the split, thereby compensating for wear, 60 and insuring a tight fit.

What is claimed is:

A carburetor including a casing, a nozzle for discharging gasoline into the casing, a rotatable throttle valve in the casing longi- 65 tudinally split whereby to flex into contact with the walls of the casing, a portion of the valve being flexibly adjustable and peripherally grooved, means on the casing engaged in said groove whereby to cause longitudinal movement of the valve upon rotation thereof, 70 and a needle valve carried by the throttle valve movable with the throttle valve into and out of said nozzle.

In testimony whereof, I affix my signature.  
 BENJAMIN F. GRAVELY. 75

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