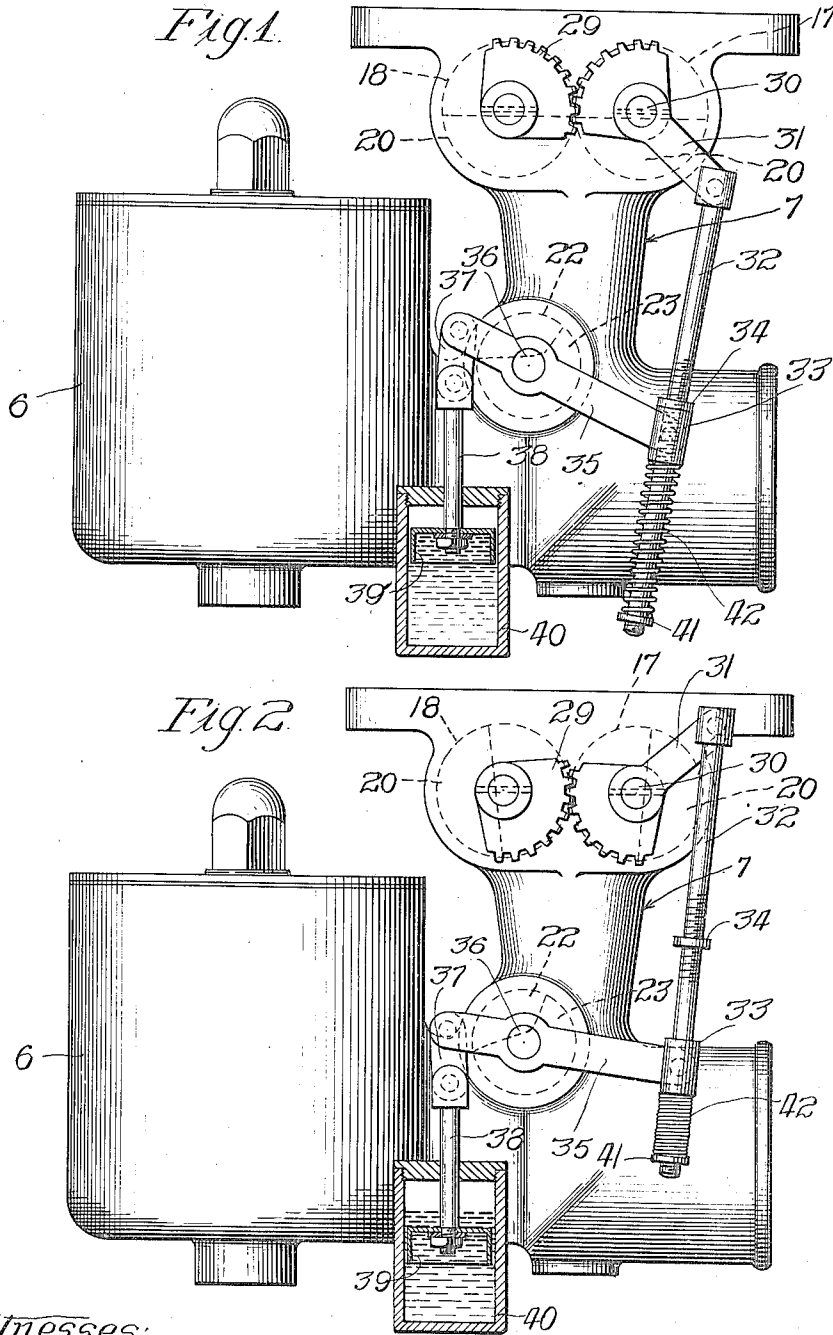


W. D. BEAMER & J. F. DUFFY.  
CARBURETER.  
APPLICATION FILED MAR. 3, 1915.

1,161,437.

Patented Nov. 23, 1915.

2 SHEETS—SHEET 1.



Witnesses:  
*Harry S. Gaither*  
*Wm. P. Bond*

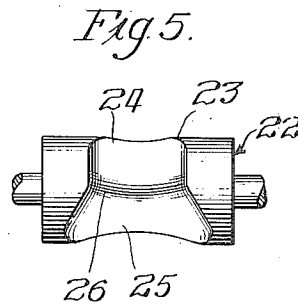
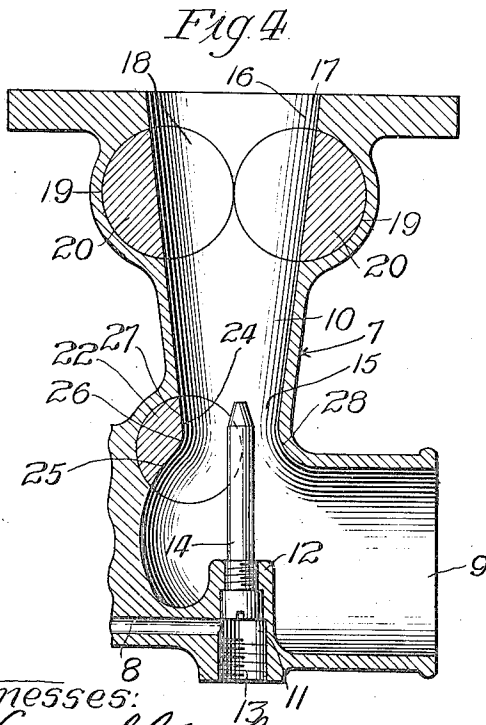
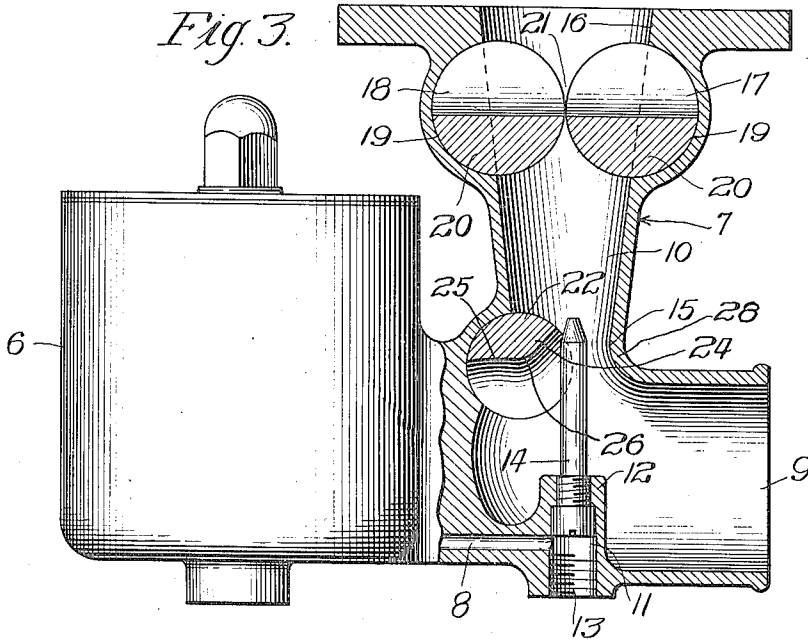
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# UNITED STATES PATENT OFFICE.

WILLIS D. BEAMER AND JAMES F. DUFFY, OF CHICAGO, ILLINOIS.

CARBURETER.

1,161,437.

Specification of Letters Patent.

Patented Nov. 23, 1915.

Application filed March 3, 1915. Serial No. 11,857.

*To all whom it may concern:*

Be it known that we, WILLIS D. BEAMER and JAMES F. DUFFY, both citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

The present invention relates to carbureters employed in connection with explosive engines and certain portions of the carbureter structure are based on similar principles to those disclosed in our Patent No. 1,131,312, granted to us March 9, 1915, for carbureters.

The object of the invention is to provide a single shiftable member at the throat of the Venturi passage, the function of which would be to change the area of said throat in accordance with the opening of the throttle valve.

A further object of the invention is to provide shiftable members which will control the throttle end of the venturi and act as throttle valves.

A further object of the invention is to provide a connection between the throttle valve and the Venturi control and to provide means for retarding the movement of the Venturi control when a sudden opening of the throttle valve is effected.

A further object of the invention is to provide means for gradually moving the Venturi throat control after the throttle valve has been suddenly opened until said control will eventually be in proper position to have the desired relative degree of opening at the throttle of the venturi and at the throat end of the venturi.

The invention further consists in the features of construction and combinations of parts hereinafter described and claimed.

In the drawings: Figure 1 is a side view of the carbureter of the present invention showing the dash pot in section, and the throttle valve and Venturi control in their farthest closed position; Fig. 2 is a view similar to Fig. 1 showing the position assumed by the various parts of the device when a sudden and full opening of the throttle valve is effected; Fig. 3 is a side view showing the gasoline chamber in elevation and the Venturi passage and its associated parts in section, and showing the throttle valve and Venturi control in their farthest closed position; Fig. 4 is a section

of the Venturi passage and its associated parts showing both the throttle valve and Venturi control fully open; and Fig. 5 is a detail of the roller forming the Venturi control.

That feature of the present invention, which relates to the control of the Venturi passage, is based on the same general principle as the Venturi control shown in our issued Patent No. 1,131,312, granted March 9, 1915, for carbureters and previously referred to.

The points of difference between the present Venturi control and that shown in the above application will appear from the following description.

It has been found that it is undesirable when a throttle valve is suddenly thrown to full open position, or substantially full open position, by a quick movement of the accelerator member, to have the means which control the passage of air through the venturi simultaneously open to a corresponding degree, the reason being that there is a sudden suction of air through the Venturi passage when the throttle is fully opened, which takes place so quick that it does not draw out the proper amount of gasoline, with the result that a mixture is fed into the piston chambers which contains altogether too much air. This results in a choking and pounding of the engine, which is very undesirable. In the present invention in order to overcome this difficulty means are provided for retarding the movement of the Venturi controlling member, whereby when a sudden movement is given the accelerator and the throttle valve thrown wide open the movement of the Venturi control is retarded and opens gradually, whereby an abnormal rush of air through the Venturi passage is prevented and thus the explosive mixture flowing into the engine will not have an abnormal quantity of air.

Referring to the drawings, the carbureter consists of a gasoline chamber 6 which can be of any suitable construction, and the structural details of this chamber are not deemed necessary of description or illustration in connection with the present case. The carbureter also consists of the Venturi or mixing portion 7, and this portion is chambered to provide a gasoline passage 8, an air passage 9, and a Venturi tube 10. The gasoline passage communicates with a chamber 11 in a nipple or lug 12. This

chamber is closed at one end by a suitable plug 13, and inserted into said chamber is a spray nozzle 14 of suitable character, which nozzle as usual is formed with a pas-

5 The Venturi tube 10 consists of a neck portion 15, which is the most restricted part of the tube, and the walls of the Venturi tube continue upward toward the throttle end of the mixing chamber in diverging relation, as will be clearly seen from the drawings, and for clearness the upper portion 16 of the venturi may be termed the throttle end of the Venturi tube. Controlling this throttle end are rollers 17 and 18, each of which is formed with a semi-cylindrical groove cutting substantially half way through the transverse dimension of the roller. The construction and arrangement will be clear from the drawings. These rollers protrude into the Venturi tube and are mounted or journaled within suitable recesses 19 formed in the wall of the mixing chamber. With the parts in the position shown in Figs. 1 and 3 the rollers are moved so that the solid portions 20 thereof are brought into the Venturi passage proper to form an obstruction therein and the passage is then throttled.

30 It is not intended in carbureter constructions to ever fully close the throttle end of the Venturi tube, and as will be seen from Fig. 3 a slight space 21 is left between the rollers 17 and 18 even when they are in closed position, and by means of such slight space a small amount of gas can be drawn into the engine and the so-called idling of the engine produced. It is apparent that as the rollers 17 and 18 are turned from their closed position, the solid portions which project into the Venturi tube will be moved farther apart so as to increase the opening at the throttle end of the venturi and thus by turning these rollers back and forth the area of the opening at the throttle end of the venturi can be increased or decreased as desired. It is imperative in the operation of carbureters that when the throttle is open to various positions, the amount of gasoline drawn from the spray nozzle and co-mingled with the air to form the explosive mixture should at all times be of a predetermined proportion; that is the relative proportion of gasoline and air should at all time be the same though the amount of both may vary.

In the present invention means have been provided for changing the throat area of the venturi in accordance with the degree of the throttle opening; that is when the throttle opening is most restricted, the area of the Venturi throat will be most restricted, and when the throttle opening is widest the opening at the throat of the venturi will be widest. Thus the amount of air

and gasoline sucked through the venturi will be relatively small when the throttle is closed and relatively large when open but the proportion of the air and gas will remain the same. This theory of operation is fully disclosed in our issued Patent No. 1,181,312, granted March 9, 1915, for carbureters and heretofore referred to.

In the present invention a roller 22 is employed formed with a groove 23, said groove consisting of a portion 24 and 25 separated by a rise or ridge 26, the formation of this roller will be clear from Fig. 5 of the drawings. The groove in the roller is so cut that when the roller is turned to proper position, the walls 27 of the groove portion will aline with the walls of the Venturi tube and the ridge 26 will form a portion of the wall of the throat of the venturi. The other portion of the wall of said throat is an integral part of the wall of the mixing chamber of the carbureter and is designated by the numeral 28 in the drawings. When the roller 22 is turned, as in Fig. 3, it is obvious that the area of the Venturi throat is restricted by reason of the roller projecting out into the passage of the venturi. The roller assumes this position when the throttle valve is in its closed position, as in Fig. 3, and under such conditions a proper throat area of the venturi will be created in accordance with the size of the opening at the throttle end of the venturi.

For actuating the rollers 17 and 18 in unison and in opposite directions, we employ segmental gears 29, and to a trunnion 30 of one of these rollers is attached an arm 31, connected to a link 32, mounted to slide on this link is a sleeve 33, and upward movement of said sleeve on said link is limited by a stop which as shown is adjustable. The sleeve 33 is connected to or formed with a lever 35 mounted upon the trunnion 36 of the roller 22, and pivoted to the lever 35 at the opposite end from the end carrying the sleeve 33 is attached is a link 37 connected with a stem 38 attached to a piston 39 which piston operates within a dash pot 40, which may be filled with oil or other suitable substance. Attached to the end of the link 32 is a washer or abutment 41, and interposed between this washer and the sleeve 33 is a spring 42.

The function of the foregoing described arrangement of parts is to establish a connection between the throttle controlling members and the Venturi throat controlling member, which connection will act to retard the movement of the Venturi control when the throttle control is suddenly actuated, and such retarding movement is effected as follows: A quick actuation of the accelerator member will act to immediately rotate the rollers 17 and 18 from the position shown in Fig. 1 to that shown in Fig. 2.

and throw open the throttle end of the venturi. If a direct connection were maintained between these rollers and the roller 22, the roller 22 would be simultaneously operated to immediately throw open the Venturi throat, but owing to the presence of the piston 39 working against the oil within the dash pot 40, a quick pressure on the lever 35 will result in a sudden bringing of said piston into hard engagement with the oil in the dash pot, and a resistance will be offered by the oil to the advancement of the piston which will check and retard the movement of the lever 35 and sleeves 33, and hence the link 32 will pull through the sleeve compressing the spring, as in Fig. 2. There will, of course, be a slight opening of the Venturi throat control member by the initial movement of the parts but the opening will not be appreciable. After the spring has been compressed as in Fig. 2, this will exert a pressure on the sleeve 33, which will be communicated to the lever 35 and link 37, thence to the stem 38 and to the piston 39, and this pressure will act to gradually force the piston down through the oil in the dash pot, until the lever 35 is swung to finally place the roller 22 in the position shown in Fig. 4, but the movement of the roller 22 to this position will necessarily be slow, and hence the opening of the Venturi throat will be gradual, and under such conditions an excess amount of air

will not be sucked through by a sudden opening of the throttle but the increased flow of air through the venturi will be gradual and a uniform mixture maintained. When the spring 42 has fully acted to lower the piston in the dash pot the sleeves 33 will again engage the stop member 34 and when the throttle is again moved to closed position the parts will all be returned to the position shown in Fig. 1, since the direct pressure through the stop member 34 will at such time be exerted upon the sleeve 33.

We claim:

In a carbureter, the combination of a casing having a passage therethrough embodying a Venturi tube, a single grooved roller at the throat of said tube for controlling the area of said throat, said roller being mounted partially within and partially without the walls of the casing and lying at all times to one side of said nozzle, whereby an uninterrupted passage of fixed area is at all times provided about said nozzle at all points, except where said roller is located, means for controlling the area of the throttle end of the venturi, and means operatively connected for moving said throat and throttle controls, substantially as described.

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