J. O. HOBBS.
CARBURETER.
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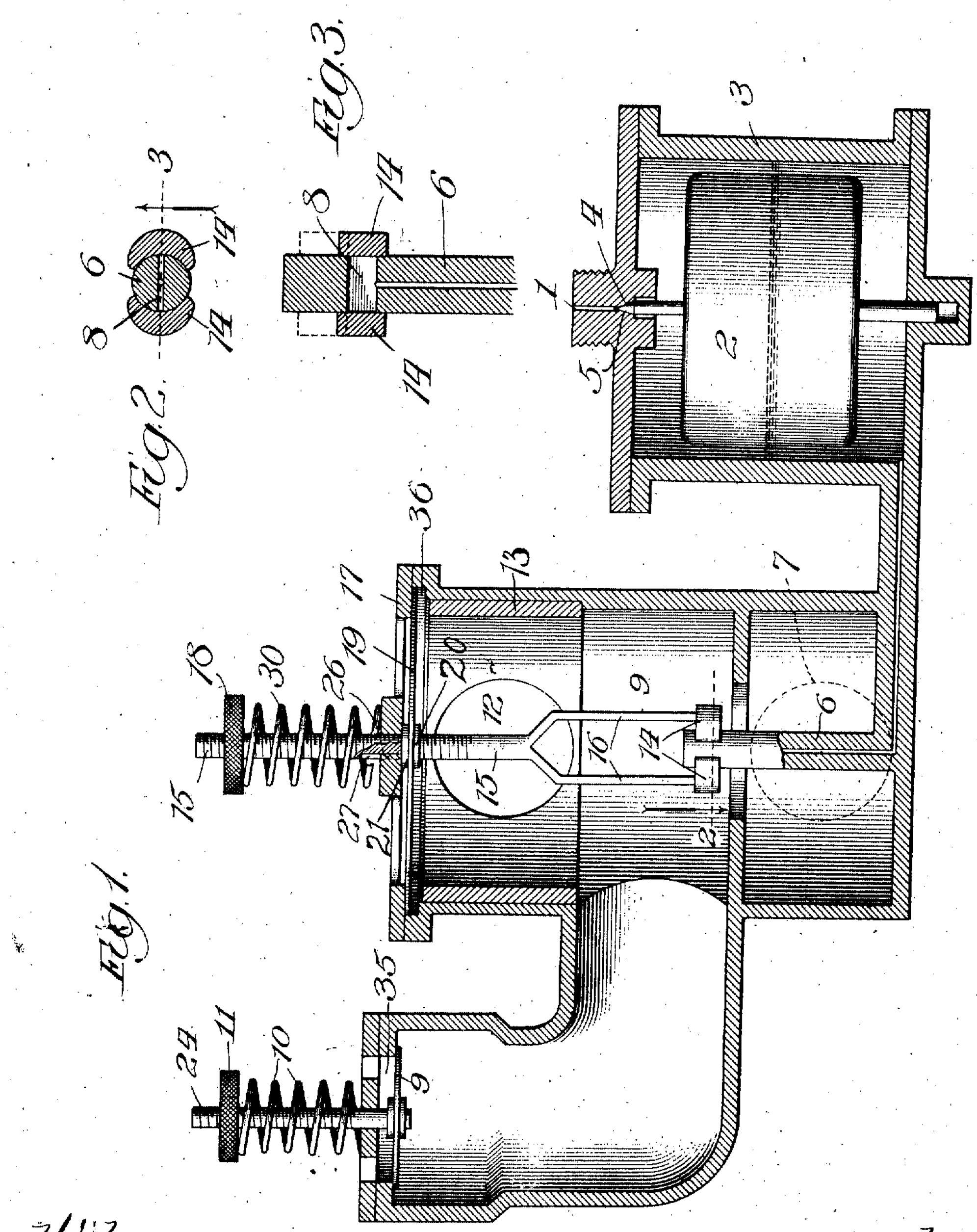
1,001,847. Patented Aug. 29, 1911.



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UNITED STATES PATENT OFFICE.

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CARBURETER.

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To all whom it may concern:

Be it known that I, JOHN O. HOBBS, a citizen 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 object of my invention is to provide improved means for regulating the flow of gasolene or other combustible used in gas engines as the speed of the engine varies. It is well-known that variations in the speed of engines of this type cause fluctuations of pressure in the carbureting chamber resulting in an irregular flow of gasolene not properly proportioned to the needs of the engine.

The purpose of my invention is to provide means whereby variations in pressure in the carbureting chamber will through suitable valve mechanism maintain the proper flow of gasolene.

In the drawings—Figure 1 is a sectional elevation of a carbureter embodying my invention. Fig. 2 is a sectional elevation of the valve and valve seat. Fig. 3 is a cross section of the valve and valve seat.

I have illustrated my invention in connection with a carbureter of a form in common use, provided with a float feed constant level device. The reservoir 3 communicates through the passage 1 with a reservoir, not shown, containing gasolene or other hydrocarbon. The passage 1 is provided at its lower end with a valve seat 4 co-acting with the valve 5 attached to the float 2. This part of the device operates in the usual manner to maintain the hydrocarbon at a constant level in the outlet pipe 6 located in the carbureting chamber. The pipe 6 in the form of apparatus illustrated is provided near its upper end with transverse apertures 8 through which the hydrocarbon is designed to be drawn by the partial vacuum existing in the carbureting chamber 9 during the suction stroke of the piston. The engine proper is not shown in the drawings as it forms no part of my invention, but the combustion chamber thereof communicates with the carbureter through the opening 12 in the barrel throttle 13.

The main air supply opening is represented by the numeral 7 and the secondary air inlet by the numeral 35. The latter is normally closed by the valve 9 which is held in closed position by the spring 10 bearing against the adjustable nut 11 on the valve stem 24.

Co-acting with the valve seats formed by the apertures 8 in the tube 6 is a two part valve 14 designed to move in a vertical direction over the valve seats. Each of the parts 14 constitutes a separate valve having the form of a segment partially surrounding the pipe 6. Owing to the fact that the presence of gasolene renders it impossible to properly lubricate the valve and valve seat, I have constructed the valve in two sections partially embracing the circumference of the pipe 6. By means of this construction I avoid the possibility of the valve binding or becoming wedged, which effect would result if a valve in the form of a continuous ring were used. In its broader aspect, however, my invention is not limited to the particular form or number of valves used. The sections of the valve 14 are mounted upon the forked ends 16, 16 of the valve stem 15. The lower ends 16 of the valve stem are given a slight initial tension inward in order to hold the valves 14 to their seats with the requisite spring pressure. Each of the valves 14 is, therefore, mounted on a spring, which in the apparatus illustrated consists of one of the ends 16 of the stem 15. The valve stem 15 extends through the casing 17 of the carbureter. The upper end of the stem is screw-threaded and carries a nut 18 preferably knurled upon its periphery. A spring 30 abuts at its lower end against the casing 17 of the carbureter and at its upper end against the nut 18, thus tending to hold the valve normally in its uppermost position. The casing 17 at the top of the carbureter consists of a spider or perforated plate. Located beneath this spider or perforated plate is a circular plate or piston 19 of slightly greater diameter than the interior of the carbureter chamber. The plate 19 is seated in an annular groove 36 in the wall of the carbureter chamber and is free to move vertically between the upper and lower walls of said groove. By this arrangement the plate 19 is exposed on the upper side to atmospheric pressure and on the under side to the pressure in the carbureting chamber.

The valve stem 15 is operatively connected to the plate 19 by means of nuts 20 and 21 threaded on the valve stem above and below the plate. By means of these nuts the initial position of the valve 14 relative to the valve seat may be adjusted. The nuts 20 and 21 also serve to transmit the movement of the plate 19 to the valve. The nut 18 affords means for adjusting the tension of the spring 30, thereby regulating the amount of force necessary to move the plate 19 and the valve 14. Any suitable means may be adopted for preventing the valve stem 15 from rotating and thus displacing the valve members 14, 14 from their proper positions relative to the aperture 8. In the present instance I have shown a lug 26 upon the casing 17 and a co-acting groove 27 in the stem 15.

In operation the position of the valve 14 will be so adjusted relative to the aperture 8 in the outlet tube 6 that the proper amount of hydrocarbon will flow through the aperture 8 during the operation of the engine at normal speed. Whenever owing to a light load or other cause the engine speeds up beyond the desired limit the increased suction due to the rapid movement of the engine piston will decrease the pressure in the carbureting chamber 9 below the limit reached during the operation of the engine at normal speed. As the pressure on the upper side of the plate 19 is constant, *i. e.*, atmospheric pressure, the decrease of pressure on its lower side will result in a depression of the diaphragm. The downward movement of the diaphragm being transmitted to the valves 14 will result in moving the valves to an extent determined by the difference in pressure upon the opposite sides of the diaphragm. By proper adjustment of the nuts 20 and 21 the valve 14 may be positioned with its lower edge normally adjacent the top of the aperture 8, in which case the downward movement of the plate 19 will decrease the size of the gasolene outlet opening, or the valve may be normally adjusted with its upper edge at a point intermediate the top and bottom of the aperture 8, in which case the downward movement of the plate 19 will increase the size of the gasolene outlet by uncovering the aperture 8. Either of the adjustments referred to may be used, depending on whether it is desired to increase or decrease the size of the gasolene outlet upon an increase in the speed of the engine.

While the springs 10 and 30 are shown as having a wide range of adjustment, I find it desirable to have the valve over the secondary air inlet open for a less degree of vacuum than that necessary to shift the piston 19 and the valves 14.

It will be readily understood that in place of the movable plate 19 I may provide a flexible diaphragm fixed at the edges and attached to the valve stem at the center.

From the foregoing it will clearly appear that I have provided simple and effective means for governing the flow of gasolene or other liquid fuel in such manner as to properly regulate the speed of the engine.

While I have described one specific embodiment of my invention, it will be understood that the principle involved may be applied in mechanisms of widely divergent forms, and that my invention is not restricted to the specific device illustrated and described herein.

I claim:

1. In a carbureter, an adjustable valve for regulating the size of the hydrocarbon outlet, means for adjusting said valve, said valve in one adjustment operating to increase the size of the hydrocarbon outlet upon an increase in the speed of the engine, and in another adjustment operating to decrease the size of the hydrocarbon outlet upon an increase in the speed of the engine.

2. In a carbureter, a gasolene inlet pipe with two opposite lateral openings, a slide valve member for each opening, and a spring fork carrying said members and pressing them together over the respective lateral openings.

3. In a carbureter, primary and secondary air inlets, an inwardly opening valve for said secondary inlet, a spring normally holding said valve closed, means for adjusting the tension of said spring, a gasolene inlet, a valve therefor, a movable member connected to said valve, said movable member exposed on one side to atmospheric pressure and on the other side to the pressure within the carbureter, a spring impelling said movable member against atmospheric pressure, and means for adjusting the tension of said spring, the connection between the gasolene valve and said movable member being such that said valve is given a closing movement when the degree of vacuum in the carbureter increases and an opening movement when the degree of vacuum decreases.

4. In a carbureter, a gasolene inlet pipe provided with an opening, a valve, and a spring carrying said valve and forcing the same against the surface of said inlet pipe.

5. In a carbureter, a gasolene inlet pipe provided with lateral openings, a slide valve, and a spring fork carrying said slide valve and pressing it over said lateral openings.

6. In a carbureter, a gasolene inlet pipe provided with an opening, a slide valve, a spring carrying said valve and pressing it against the surface of said inlet pipe, and a movable member connected to said spring, said movable member being exposed on one side to atmospheric pressure and on the opposite side to the pressure within the carbureter.

7. In a carbureter, a gasolene inlet pipe provided with lateral openings, a slide valve, a spring fork carrying said slide valve and pressing it over said lateral openings, and a movable member connected to said

spring fork, said movable member being exposed on one side to atmospheric pressure and on the opposite side to the pressure within the carbureter.

8. In a carbureter, a gasolene inlet pipe provided with a lateral opening, a slide valve, or spring pressing the valve against the surface of said pipe, a movable member connected to said spring, the normal position of said valve being determined by the connection between said spring and movable member, said movable member being exposed on one side to atmospheric pressure and on the opposite side to the pressure within the carbureter, and a spring operatively connected to said movable member to resist atmospheric pressure.

9. In a carbureter, a gasolene inlet pipe provided with a lateral opening, a slide valve, a spring fork carrying said slide valve and pressing it over said lateral opening, a movable member connected to said spring fork, said movable member being exposed on one side to atmospheric pressure and on the opposite side to the pressure within the carbureter, and a spring bearing upon the side of said movable member which is exposed to atmospheric pressure.

10. In a carbureter, primary and secondary air inlets, an inwardly opening valve for said secondary inlet, a spring normally holding said valve closed, means for adjusting the tension of said spring, a gasolene inlet, a valve therefor, a movable member adjustably connected to said valve, said movable member being exposed on one side to atmospheric pressure and on the other side to the pressure within the carbureter, a spring supporting said member against atmospheric pressure, and means for adjusting the tension of said spring.

11. In a carbureter, a hydro-carbon inlet pipe with lateral openings, a slide valve member for each of said lateral openings, and a spring carrying said members and pressing them together against said lateral openings.

12. In a carbureter, a hydrocarbon inlet pipe provided with a lateral opening, a valve coöperating with said opening, a spring engaging said valve and also engaging the opposite side of said pipe, the tension of said spring acting to press said valve against the lateral face of said pipe.

13. In a carbureter, a gasolene inlet pipe provided with lateral openings, valves therefor, a movable member adjustably connected to said valves, said movable member being exposed on one side to atmospheric pressure and on the other side to the pressure within the carbureter, a spring supporting said movable member against atmospheric pressure and means for adjusting the tension of said spring, the adjustable connection of said valves and said movable member being such that the size of said lateral openings can be made either to increase or diminish upon decrease of atmospheric pressure within the carbureter.

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