F. E. HALE & R. A. DULL.

FLOAT VALVE FOR CARBURETERS.

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1,295,306. Patented Feb. 25, 1919.

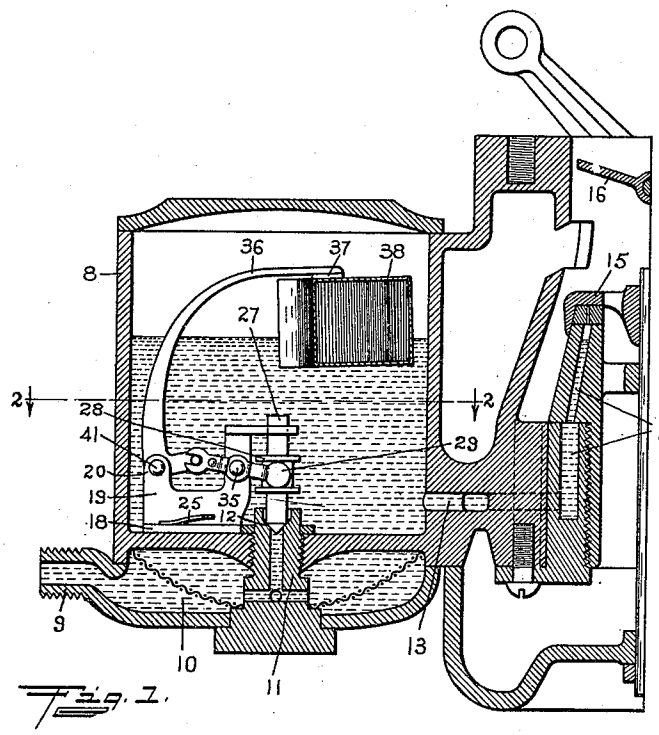


Fig. 1.

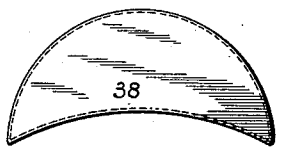


Fig. 3.

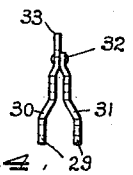


Fig. 4.

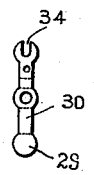


Fig. 5.

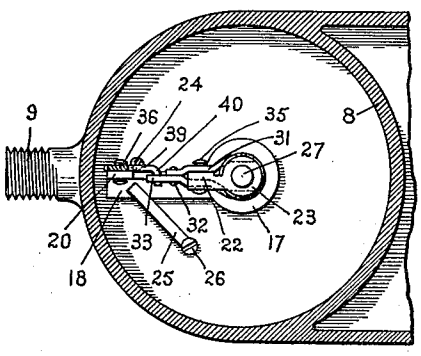


Fig. 2.

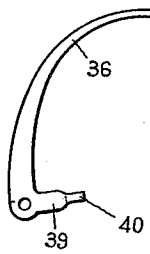


Fig. 6.

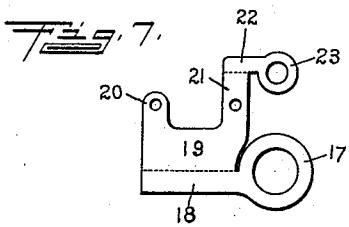


Fig. 7.

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UNITED STATES PATENT OFFICE.

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FLOAT-VALVE FOR CARBURETERS.

1,295,306. Specification of Letters Patent. Patented Feb. 25, 1919.

Application filed June 1, 1916. Serial No. 101,175.

To all whom it may concern:

Be it known that we, FRED E. HALE and RAYMOND A. DULL, both citizens of the United States, and residents of Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Float-Valves for Carbureters, of which the following is a specification.

Our invention relates to float-controlled valves, and especially to such valves as employed for maintaining a constant level of a liquid fuel in the feed-chambers of carbureters or charge-forming devices for internal combustion engines. It is the object of our invention to provide a simple and efficient float-controlled valve, especially adapted for the above described purpose, and in which the entire valve device is removable as a unit from the fuel-chamber in which it operates, to facilitate the assembling, inspection and cleaning of the same. A further object of our invention is to provide a valve of this type having the float so arranged that it will tend to maintain a constant level of the fuel relative to a discharge opening, notwithstanding tilting of the device toward or away from the side of the fuel receptacle near which the discharge opening is located.

In the accompanying drawings Figure 1 is a vertical sectional view of a portion of a carbureter provided with a valve mechanism embodying our invention, Fig. 2 is a horizontal section of the same on the plane of the line 2—2 of Fig. 1, Fig. 3 is a plan view of the float, Fig. 4 is a detail plan view of the valve-lever, Fig. 5 is a detail side view of the same, Fig. 6 is a detail side view of the blank from which the float-lever is formed, and Fig. 7 is a detail plan view of the blank from which the base-plate is formed.

In the drawing there are shown certain parts of a carbureter, whereof most of the detailed structure is immaterial to the present invention, so that it will be sufficient to merely enumerate the parts in order that their connection and association with the valve devices may be apparent. Thus, there is shown the fuel receptacle 8 in which the valve device is located and in which it serves to maintain a constant level of the liquid fuel. The fuel is supplied to said receptacle through a pipe which is connected with a nipple 9, passing therefrom into a screen-chamber 10, and from said chamber passing up through a nipple 11 which extends through the bottom of the receptacle 8 and projects slightly into the fuel-chamber, the passage through said nipple being enlarged at its upper end to form a valve-seat 12. At one side of the fuel-chamber there is a laterally extending passage 13, the same communicating with a vertical passage 14 which extends to a point above the normal level of the liquid fuel in the receptacle 8. At the upper end of the passage 14 the outlet therefrom is controlled by a movable part 15 which may be so positioned as to permit the fuel to flow up through said outlet when the fuel-level is raised by the suction of the air being drawn into the engine through the passage controlled by the throttle 16.

Referring now to the valve device, the same has a base-portion formed from an integral metal plate of which the form, when flat, is as shown in Fig. 7. Said plate is bent at right angles along the parallel dotted lines shown in said figure, and in the completed form there is an upper and a lower horizontal portion and an intermediate vertical connecting portion. The lower horizontal portion comprises an annular part 17 and a rectangular part 18 extending from one side of the annular part. The upper part of the intermediate or vertical plate-portion 19 has two perforate fingers 20 and 21, and the latter carries the upper horizontal portion which consists of a rectangular stem part 22 and an annular part 23. The annular part 23 is alined axially with the lower annular part 17, and the latter is adapted to fit around the portion of the nipple 11 which extends into the fuel-chamber, the ring 17 and stem 18 resting on the bottom of the receptacle 8. One side of the stem-part 18 is placed against the head of a screw 24 in the bottom of the receptacle, and the plate is held in position against said screw by means of a flat spring 25 of which one end is secured to the receptacle by a screw 26 and the other end rests on the plate, as shown in Fig. 2.

The valve-stem 27 fits slidably in the central opening of the annular part 23, being guided thereby so as to be held in alinement with the valve-seat 12 in the nipple 11. On the central part of the valve-stem there is a double-flanged collar 28, and the circular heads 29 of the forked valve-lever fit in the

groove between the flanges of said collar. The valve-lever, of which the form is shown in detail in Figs. 4 and 5, comprises two bars 30 and 31 which carry the heads 29 and are secured to each other near the opposite end by a rivet 32. The bar 30 has a circular head 33 extending beyond the rivet 32 and having therein a transverse slot 34. The lever straddles the vertical finger 21 of the base-plate, and is pivotally connected therewith by a pin or rivet 35 passing through the perforation in said finger, and through corresponding openings in the central parts of the bars 30 and 31.

The float-lever comprises a long curved arm 36 having a head 37 which is attached to the float 38, and a short arm 39 having at its end a laterally extending pin 40 adapted to fit in the slot 34 of the valve-lever. Said float-lever is pivotally connected with the finger 20 of the base-plate by means of a pin or rivet 41 passing transveresly through the perforation in said finger, and through a similar opening in the lever. The float-lever is preferably formed by stamping from a flat plate a blank having the form shown in Fig. 6, and afterward bending the head 37 and pin 40 laterally at the places indicated by dotted lines in said figure.

The float 38 is a hollow metal meniscal or crescent-shaped body, rectangular in vertical section as shown, and is held by the float-lever so as to be near one side of the fuel-receptacle 8 and movable substantially vertically. The construction as a whole is such that, when the fuel reaches the desired level in the receptacle, the float is raised and the movement of the float-lever is communicated by the pin 40 to the valve-lever, the latter moving about its fulcrum on the pin 35 and pressing the valve stem downwardly to close the supply opening at the seat 12. By similar movement the valve-stem is raised and fuel admitted through the nipple 11 when the level in the receptacle is lowered.

Now the valve mechanism is so positioned in the fuel-receptacle 8 that the float lies at the side of the chamber nearest to the outlet or discharge passage 14. As a result of this arrangement the device tends to maintain a nearly constant level of the fuel in the discharge-passage when the carbureter is tilted or inclined so that the part containing the passage 14 is raised or lowered relatively to the fuel receptacle. Thus, if the carbureter is tilted so that the fuel receptacle is raised, relatively to the outlet from the passage 14, the change of level of the liquid in the receptacle will tend to elevate the float and thus prevent the admission of more fuel to the receptacle until the level thereof has been lowered to a point which would be below the normal if the carbureter were in its normal horizontal position. Similarly, a tilting of the carbureter in the other direction will cause the float to be lowered and at once admit more fuel to the receptacle. In either case the tendency is to maintain a more constant level of the fuel in the passage 14 than would be maintained if the float were positioned concentrically with the fuel-chamber.

By moving the spring 25 pivotally about the screw 26, said spring may be disengaged from the base-plate and the latter may then be lifted out of the receptacle 8, carrying with it the entire valve mechanism. By the mounting of the entire valve mechanism upon the base-plate, so that said mechanism may be removed and inserted as a unit, the assembling, inspection and cleaning thereof is greatly facilitated.

Now, having described our invention, what we claim and desire to secure by Letters Patent is:

1. In a carbureter, the combination with a fuel receptacle having an inlet valve-seat and an inwardly projecting member concentric with said valve-seat, of a base having an annular part fitting slidably upon said inwardly projecting member and an elevated guide positioned above the seat, a valve slidable in said guide and engageable with the valve-seat to close the same, a float, levers mounted on the base and connecting said float and valve, and releasable means engaging the base to retain the same in position with its annular part around said inwardly projecting member.

2. In a carbureter, the combination with a cylindrical fuel receptacle having a fuel inlet nipple projecting through the bottom at the center thereof, and a valve-seat formed in said nipple, of a vertically movable valve engageable with said seat to close the inlet opening, a base-member resting upon the bottom of the receptacle and having an elevated guide for said valve and an annular part fitting slidably about said nipple to center the guide therewith, a valve-lever fulcrumed on said guide, a float-lever fulcrumed on a part of the base adjacent to one side of the receptacle and having an arm extending toward the valve and connected with the valve-lever, said float-lever having a second arm extending upwardly from the fulcrum and across the receptacle above the valve, a float carried at the end of the latter arm and movable within the receptacle adjoining the side thereof opposite the lever fulcrum, and releasable means for holding the base-member upon the bottom of the receptacle.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."