Oct. 31, 1933. R. F. BRACKE 1,933,043

CARBURETOR FUEL VALVE

Filed July 25, 1929

Fig. 1

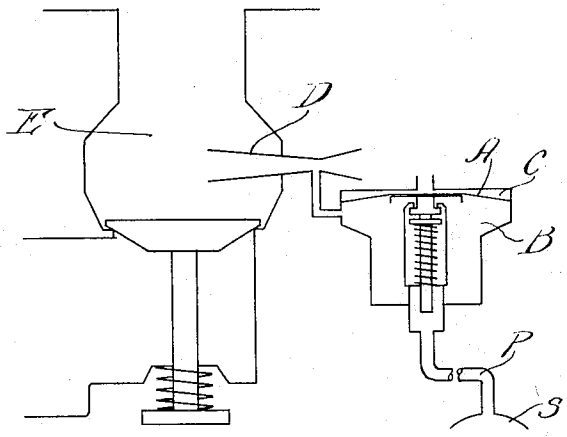


Fig. 3

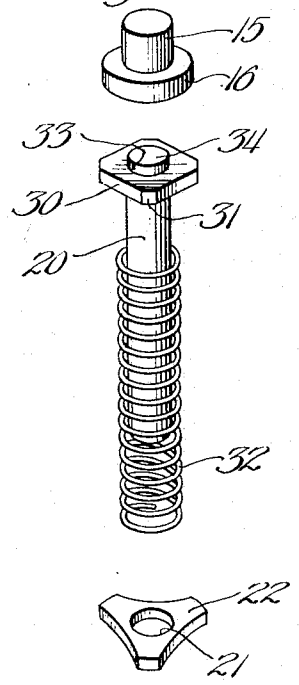
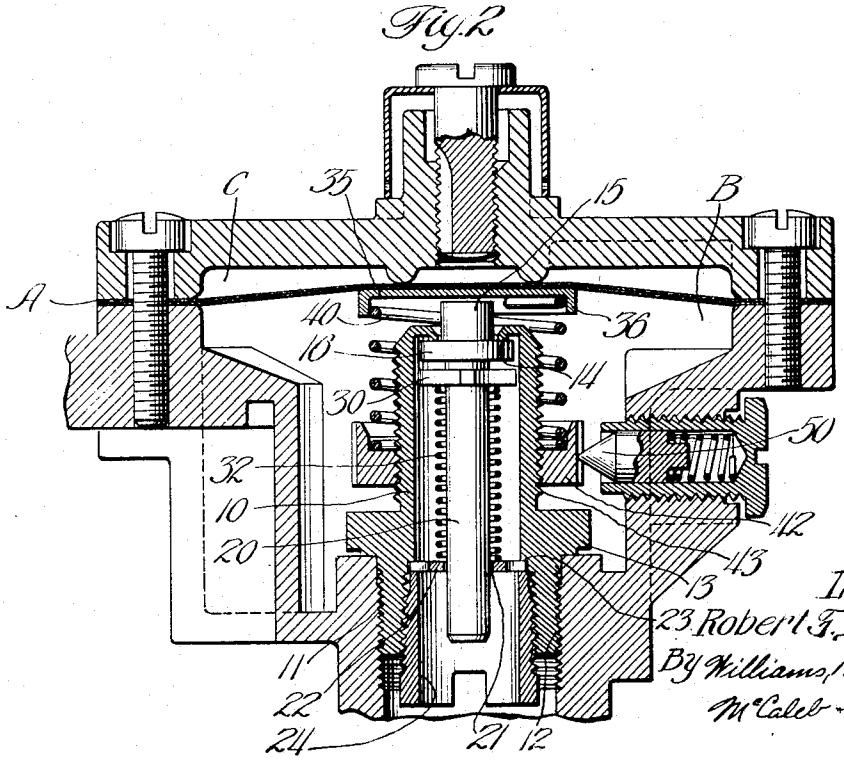


Fig. 2



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CARBURETOR FUEL VALVE

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5 Claims. (Cl. 251—144)

My invention relates to improvements in carburetor fuel valves.

An object of my invention is to provide an improved carburetor fuel valve.

A further object is to provide a carburetor fuel valve which does not become worn through use so as to jeopardize the seal between the valve and valve set when the valve is closed.

Another object is to provide a carburetor fuel valve in which the tendency to create a perfect seal between valve and valve seat actually increases through continued use.

A further object is to provide a carburetor fuel valve in which both the valve and the valve seat are constructed of soft metal. It has been customary in the past to construct the valve and often the valve seat of hard metal such as steel or monel to withstand as long as possible the severe wear encountered.

Another object is to provide a carburetor fuel valve which may be manufactured at a relatively low cost and is easily assembled.

Other objects and advantages will hereinafter appear.

An embodiment of my invention is illustrated in the accompanying drawing forming a part of this specification wherein:

Fig. 1 is a schematic view illustrating a carburetor equipped with my improved fuel valve;

Fig. 2 is a sectional view of the fuel valve; and

Fig. 3 is a perspective view of parts of the fuel valve disassembled.

The fuel valve illustrated in the drawing is one intended for use with a carburetor of the fuel lift type, wherein a diaphragm A is subjected to a depression on that side which is exposed to the fuel chamber B and to atmospheric pressure on its opposite side C so that the diaphragm is caused to flex by a differential in pressure and thus operate the fuel valve.

The depression in the fuel chamber B is maintained by a Venturi tube fuel nozzle D extending within the induction passage E of the carburetor, the throat of which nozzle communicates with the fuel chamber B. Thus the relatively high depression existing at the constricted throat of the Venturi is utilized to control the opening of the fuel valve.

Referring now to Figures 2 and 3 of the drawing, the valve comprises a body 10 having an externally threaded portion 11 which is received in an internally threaded bore 12 formed in the bottom wall of the fuel chamber B. Means for facilitating the placing and the removal of the body as described is provided in a hexagonal shaped enlargement 13 on the outer wall of the body adapted to be received within the head of a socket wrench.

The body 10 is hollow or tubular and formed at its upper end with a depending internal annular flange 14 forming the valve seat and defining a round opening through which a short stem 15 of the valve 16 extends. The valve 16 has the shape of a flat disc except for its upstanding stem 15 and therefore the upper surface of the disc may seat fully against the lower flat surface of the flange 14 to form a seal whether the valve shifts laterally or not.

A spring pressed plunger 20 is disposed within the body 10 and its lower end extends through an opening 21 in a spider 22 held securely against a shoulder 23 formed on the interior wall of the body 10, by a tubular plug 24 which is fitted within the lower end of the valve body by threads provided on the plug and the adjacent body wall.

The upper end of the plunger 20 carries a flat square head 30, the corners of which are rounded as shown at 31 to conform with the body wall between which and the spider 22 a compression spring 32 encompassing the plunger 20 is disposed. The upper side of the head 30 has an upstanding disc-like projection 33 with a flat upper surface 34 which is caused to bear directly against the flat under-surface of the valve 16. The valve 16 is thus normally closed against its seat by the force of the compression spring 32.

In order to insure against an unnecessary wear of the diaphragm A a plate 35, having a downwardly extending skirt 36, is disposed between the diaphragm and the stem 15 of the valve 16 so that the diaphragm does not directly come into contact with the valve.

The plate 35 performs the additional function of receiving one end of a compression spring 40, the other end of which bears against an internally threaded nut 42 which is received upon an externally threaded portion 43 of the body 10 above the hexagonal enlargement 13. By adjustment of the nut 42 the proper tension may be brought upon the diaphragm A to cause the opening of the valve 16 at any desired fuel chamber depression.

The nut 42 is held against displacement from its adjusted position by a spring pressed pawl 50 which engages with the knurled outer wall of the nut.

When the valve 16 is opened signifying that a

condition of depression exists in the fuel chamber B, fuel is drawn upwardly from a supply tank S, through a pipe P, into the fuel chamber B and from thence to the throat of the fuel Venturi nozzle D, where it is discharged along with the primary air stream passing through the venturi into the induction passage E.

Both the valve 16 and its valve seat 14 which may form an internal part of the body 10 are made of brass which is possible because of the large contacting area of the valve with its seat assuring against the wearing away of the parts in short time.

As a matter of fact, in the operation of my improved fuel valve I have found through prolonged tests that the valve after intensive use tends to more perfectly form a seal when closed than when first assembled. This important characteristic of the valve is exactly opposite to that which takes place in the use of the present type of fuel valve employed in carburetors for many years past. In the old type of valve it was customary to use a conically pointed shaft which point seated against a ring-shaped seat and was therefore known as a needle valve. In use grooves were quickly worn in the conical point, even though hard steel or Monel metal were used, which, of course, resulted in faulty and irregular valve action. I have entirely overcome this obstacle in valve operation by the structure herein described.

The valve 16, regardless of its initial position with respect to its seat 14, will always be brought into proper engagement with the seat by the spring pressed plunger 20 and its head 30.

It will be noted that the relatively broad flat contacting surfaces of the valve and valve seat lie in a plane transverse to the axis along which the valve is caused to move. The valve may thus rotate about its axis in use and probably does, which movement but further assures smooth and uniform contacting surfaces. Extreme wear through long usage does not in any way alter the gap through which fuel may pass between valve and seat when the valve is opened. This characteristic also is contrary to the needle type of fuel valve heretofore discussed, wherein grooves formed through wear cause a relatively sudden expansion of the gap when the needle is moved and thereupon by further movement an increase in gap size of lesser amplitude.

I claim:

1. A carburetor fuel valve comprising an annular valve seat having a relatively broad flat surface, a valve member having a seat engaging flat hard surface for engagement therewith and adapted to move along an axis transverse to said flat surface, said valve member being further formed with that surface facing away from the valve seat flat and parallel thereto, and a spring pressed plunger adapted to engage that surface facing away from the valve seat for moving the valve member into yielding engagement with its seat.

2. A carburetor fuel valve comprising a valve seat, a valve member adapted to engage with said seat, the contacting surfaces of said valve member and said seat being relatively large and lying in a plane transverse to the axis along which the valve member may move, a spring pressed plunger having a head adapted to bear against said valve member and yieldingly to hold the valve upon its seat, said plunger being arranged to move along an axis coinciding to the axis of the valve member whereby the same may be brought to fully bear against the seat regardless of slight tilting or lateral displacement of the plunger.

3. A carburetor fuel valve comprising a valve seat, a valve member adapted to engage with said seat, the contacting surfaces of said valve member and said seat lying in a plane transverse to the axis along which the valve member may move, a spring pressed plunger having a head adapted to bear against said valve member and to yieldingly hold the valve member upon its seat, that surface of said valve member against which the plunger bears being flat and parallel with its seat contacting surface, said plunger being arranged to move along an axis coinciding with the axis of the valve member whereby the same may be brought to fully bear against the seat regardless of slight tilting or lateral displacement of the plunger.

4. A carburetor fuel valve comprising an annular flat surfaced valve seat, a valve having a broad flat surface adapted to engage said seat, the contacting surfaces of said valve and said seat lying in a plane transverse to the axis along which the valve may move, and spring pressed means having a flat contacting surface adapted to bear against said valve and to yieldingly move the valve against the seat, said valve being capable of rotation about its axis during movement of said valve to assure a positive contacting surface with said seat at all times.

5. A carburetor fuel valve comprising a tubular body, a depending internal annular flange at its upper end forming a flat valve seat, a valve member having a flat hard surface for contacting the flat annular surface of said seat, said valve member being adapted to move along an axis substantially transverse to said flat surfaces, and spring means engaging said valve member for yieldingly holding the valve in engagement with the seat.

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