Oct. 12, 1926. 1,602,855

W. H. MUZZY

RESERVE FUEL DEVICE FOR AUTOMOBILES

Filed Jan. 7, 1922

Fig. 1

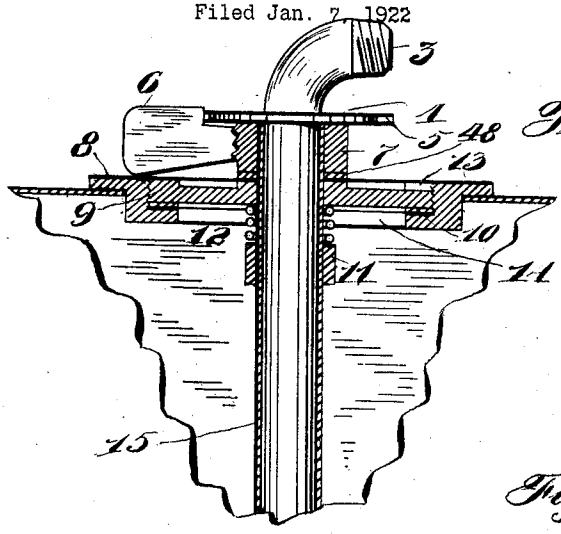


Fig. 2

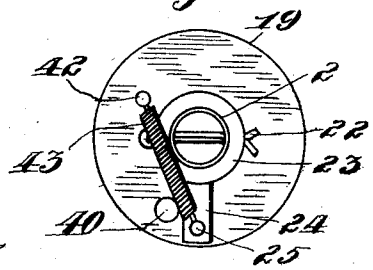


Fig. 3

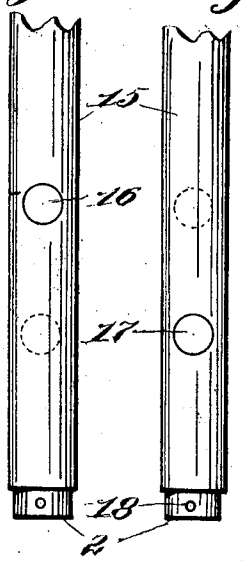


Fig. 4

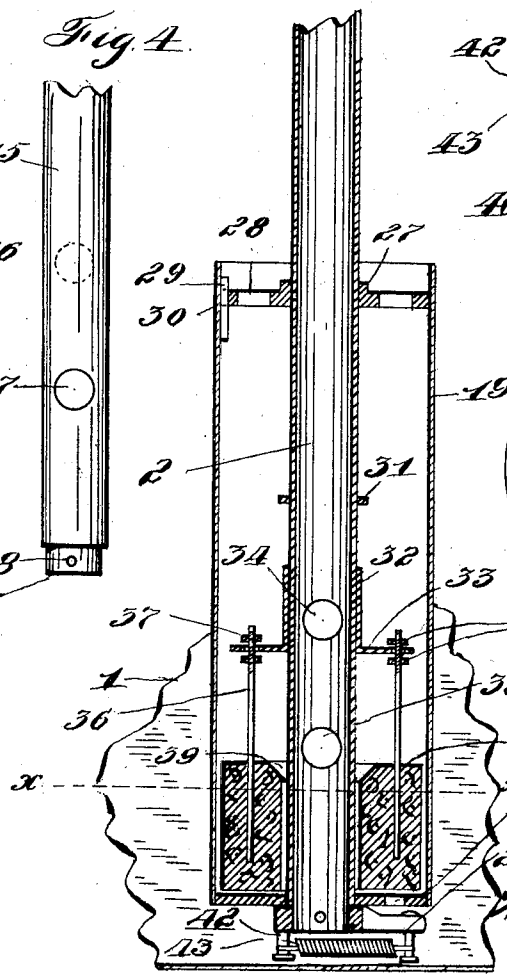
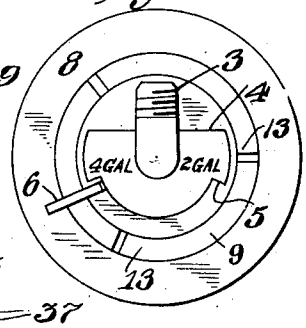


Fig. 5.



Inventor

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UNITED STATES PATENT OFFICE.

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RESERVE-FUEL DEVICE FOR AUTOMOBILES.

Application filed January 7, 1922. Serial No. 527,607.

This invention relates to improvements in reserve fuel devices and has more particular relation to such devices as used upon automobiles.

One of the several objects of the invention is to provide a device of the character stated which will be protected against extreme agitation or surging of the fuel in the fuel tank which might otherwise interfere with its perfect operation.

Another object of the invention is to provide improved devices for moving and holding the adjustable valve carrying element to guard against careless handling or adjustment and disturbing road vibrations to which almost all cars are subjected.

A further object of the invention is to provide improved, so called "fool proof" devices which will retain a reserve of fuel under all conditions and with the adjustable control handle accidentally left in any position.

A still further object of the invention is to provide a reserve device capable of adjustment for retaining different quantities of fuel at will.

The invention also has other objects all of which will be hereafter more particularly set forth and claimed.

In the accompanying drawings forming part of this specification:—

Figure 1 represents a detail side elevation partly in section of my improved devices applied to the main gasoline tank of an automobile, the parts being partly broken away;

Figure 2 represents a detail bottom plan view of the "snap over" devices and the "splash" protecting cylinder;

Figure 3 represents a detail side elevation of the lower end of the fuel feeding pipe and control valve sleeve with the upper port open and the lower port closed;

Figure 4 represents a similar view with the lower port open and the upper port closed;

Figure 5 represents a detail top plan view of the stop plate, adjustable handle, and attaching plates.

This invention is an improvement on the devices shown and described in my co-pending applications No. 439,203 filed Jan. 22, 1921, and No. 444,157 filed Feb. 11, 1921.

Described in general terms the invention consists in projecting the vacuum fuel feeding pipe down into the fuel in the main tank to within a short distance of the bottom of the tank and providing this pipe with an air port or ports at the approximate reserve level or levels. When the air port or ports are uncovered by the lowering of the fuel, the feed of the fuel is suspended as air enters the port and breaks the vacuum. When the air port is closed the feeding of the fuel is resumed and the reserve supply of fuel drawn from the tank for use.

Heretofore in devices of this character, the exact amount of the reserve left in the tank is dependent upon the character of the road over which the automobile has been driven. If the road has been rough then the "surging" or agitation of the fuel because of the swaying or pitching of the car, will have caused a greater amount of the normal reserve to have been fed through the supply pipe as the air port will have been alternately covered and uncovered by the waves of fuel thus set in motion. These "waves" are present to a greater or less extent even on so called "good roads" and the present invention seeks to overcome this "surging" or "wave" effect and to provide a practically constant reserve under all conditions of road or use.

Another practical objection to devices heretofore in use is that if the operator should forget to "reset" them upon refilling his fuel tank, then, in this event, the supply of fuel would be completely exhausted without any warning having been given.

In the aforesaid drawings, 1 represents the main gasoline tank located at the rear of the machine and suitably connected by a supply pipe 2 with the vacuum tank or other fuel feeding agency in a manner well known in the art; the attachment to the pipe line being by means of a screw threaded elbow 3 integral with a stop plate 4 and both secured to the upper end of the pipe 2 which

projects downward to within a short distance from the bottom of the tank 1.

This pipe 2 as shown in Figure 1 is formed with two spaced air ports 34 and 35 located at different distances from the lower open end of the pipe to form two distinct reserves of approximately two gallons each.

A sleeve 15 closely surrounds the pipe 2 and as shown in Figures 3 and 4 is formed with an upper air port 16, and a lower air port 17, these ports being approximately 120° out of vertical alignment with each other so that they may be alternately brought into register with the ports 34 and 35 by the oscillation of the sleeve. This sleeve is firmly secured at its upper end to a hub 7 upon which the plate 4 rests; the hub in turn resting upon a packing washer 48. The whole assembly above is drawn downward upon the detachable plate by a coil spring 12 interposed between the under side of the plate and a washer 11 fast to the sleeve.

The plate 9 is notched as at 13 and screw threaded to screw down into an attaching plate 8 secured to the top of the tank 1. The plate 8 is formed with a flange 14 which supports a packing washer 10, the latter being held in position by the screw plate 9. By this construction the plate 9 may be unscrewed and the entire device removed from the tank through the opening in the plate 8.

The hub 7 is provided with a handle 6 which contacts with shoulders 5 formed on the plate 4 and this limits the movements of the handle in either direction.

The pipe 2 is prevented from rising inside of the sleeve 15 by a cotter pin 22 which passes through apertures 18 formed near the lower end of the pipe, and also through apertures formed in a hub 23 which, when in position, abuts against the lower end of the sleeve.

This hub 23 carries an arm 24 having a headed stud 25. A similar headed stud 42 is mounted in the bottom plate of the "splash" guard 19, the two studs being connected by a coil spring 43.

The cylindrical splash guard 19 is provided near its upper inner edge with a short key flange 29 which when the guard is slipped over the lower end of the pipe and sleeve engages or passes into a notch 30 formed in a spider guide plate 27 secured to the sleeve 15 and formed with a number of air ports 28. By the above means when the sleeve 15 is oscillated or adjusted by the handle 6 the guard cylinder turns with it and throws the pin 42 to one or the other side of the "dead" centre of the pipe 2 as related to the position of the pin 25. As the arm 24 is stationary (the elbow 3 being fast to a stationary feed pipe) the pin 42 after it passes the "dead" centre is forced, under the impulse of the spring 43, in the direction in which the operator is adjusting it and will be moved fully to its home position independently of the operator's hand and will be held there by the force of the spring against any accidental displacement because of road shocks or vibrations.

A cork float 38 is apertured to slide freely on the sleeve 15 and is connected by adjustable pins or screw rods 36 with an apertured disk 33 carrying a sleeve 32 which slides loosely upon the sleeve 15. Nuts 37 are mounted on the rods 36 above and below the plate 33 so there is perfect freedom of movement of the sleeve without any chance of binding between the movements of the cork and sleeve. The cork aperture is enlarged as at 39 so that when the cork is in its lower position as shown in Figure 1, the cork will not interfere with the free passage of air through the port 35.

When the cork is in its lower position shown in Figure 1, the gasoline level is approximately that shown by the dotted line x—x.

The operation of the devices described above is as follows:

The tank 1 is first filled with fuel and if the handle 6 is in the position to leave the upper port 34 open and the lower port 35 closed, the feed of the gasoline will stop when the level of gasoline reaches a point slightly below the port 34, the gasoline within the guard 19 being of the same level as that in the tank 1 because of a small port 40 in the bottom plate of the guard through which the gasoline may slowly pass. This port, however, is of a size that will prevent any sudden rise or fall of the level within the guard such as might be caused by the "waves" of gasoline in the tank caused by rough roads over which the car may be passing.

When the engine of the car stops because of the stopping of the flow of the fuel, the operator turns the handle 6 to its opposite position thus moving the sleeve 15 to close the upper port 34 and open the lower port 35.

The operator next drives to a supply station and refills his tank.

The lower port 35 now remains open and the engine will again stop when the level of gasoline reaches a point slightly below the port 35 as shown in Figure 1. When the level is at this point the cork float will have taken the position resting upon the bottom of the guard 19 as shown and the sleeve 32 will completely cover the port 16. The operator now turns the handle 6 back to its original position closing the lower port 35 and opening the upper port 34 but as the sleeve 32 is now over the aligned ports 16 and 34 they are to all intents closed and feed of gasoline below the port 35 level takes

place and the driver may drive to the nearest supply station and refill the tank. As he now refills the tank the cork 38 rises until the upper end of the sleeve 32 contacts with a collar 31 fast to the sleeve 15. This uncovers the upper ports 16 and 34 and the operation is repeated.

The above operation allows the operator to leave the adjusting handle in the position to which he has set it when he refills the tank and he does not have to remember to reset it and always has a reserve to take him to the nearest supply station. He cannot forget as in devices at present in use.

Another method of operation of this device is to use the two positions of the handle as a selective means for reserving either a single or a double quantity of gasoline as for country or city driving. In this use of the device he sets the handle to either the two or the four gallon position each time he refills the tank. If it is set to the four gallon position, when the engine stops he moves the handle to the opposite position to get the first two gallons and then when the engine stops again he moves it to its old position and has the use of the remaining two gallons of reserve.

A third method of use is to make a practice of resetting the handle to its two gallon position each time the tank is refilled. A minimum amount of gasoline is thus involved in the reserve but at the same time the operator is safe as should he forget sometime to reset the handle when the tank is refilled he would still have the reserve. In other words, no matter in what manner he uses his reserve, he always has "gas" and cannot forget and run out of gasoline miles away from a supply station.

Applicant is aware that devices are on the market today that provide a reserve supply of gasoline in a single undivided tank by reserving a certain low level of gasoline but he is not aware of any practical device for reserving a low level of gasoline in a single undivided tank in such a manner that the operator cannot forget and in which he may leave the adjusting or setting handle in either of its adjusted positions and still retain a reserve supply.

Further such devices as are on the market are all open to the common weakness of a variable reserve according to the rough nature of the road. In some cases this weakness goes so far as to exhaust the entire reserve because of the waves which arise in the tank. These waves reach a height of three and four inches on very rough roads and where it is desired to reserve in the tank slightly over one inch of gasoline, it will be readily seen that it is a very easy matter under such conditions to fully exhaust the reserve without the operator being notified by the engine stopping.

With applicant's device the resistance to the rapid passage of the gasoline through the pipe 2 and aperture 40 results in only a rise and fall of one eighth of an inch within the guard shell 19 with a "wave" elevation of three inches exterior of the shell. The guard may be of any desired height but is preferably about three inches above the level of the upper air port 34.

If the operator in turning the handle 6 to a new position does not turn it fully to position to cause the exact registering of the control ports 16 and 34 and 17 and 34, then the "snap over" will move the parts fully to either one position or the other and keep them in these positions against road vibrations.

When the loose sleeve 32 is opposite the port 16, the suction through this port draws the sleeve closely about the edges of the port and completely seals it in the same manner that a "flap valve" seals.

It will be seen from the above that the guard cylinder not only prevents the "waves" in the tank from reaching the air ports but what is more important still, it prevents any sudden rise or fall of the float which might cause the sleeve valve to temporarily cover the upper air port and cause the device to draw sufficient gasoline to permanently lower the gasoline level and the float and seal the port 34 at the wrong period.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In an automobile gasoline reserve device the combination with a feed pipe, of two control members relatively movable and also movable together as a self-contained unit to line up with the feed pipe, of spring "snap over" devices connecting the two members to hold them in different adjusted positions and movable with them both as a single unit.

2. In an automobile fuel reserve device the combination with a tank, of a feed pipe projecting into the same and formed with air ports, a float controlled valve for covering and uncovering one of said ports, hand operated means for controlling the ports, and a "wave" guard for the float.

3. In an automobile fuel reserve device, the combination with a tank, of a feed pipe projecting into the same and formed with air ports of different levels, a float controlled valve for covering and uncovering one of said ports, hand operated means for controlling the ports and a "wave" guard for the float, having a restricted gasoline admission port and large atmospheric ports.

4. In an automobile fuel reserve device, the combination with a tank, of a feed pipe projecting into the same, and formed with air ports at different levels, an adjustable

sleeve valve surrounding the control sleeve, a float for operating the valve, and a "wave" guard for the float.

5. In an automobile fuel reserve device, the combination with a tank, of a feed pipe projecting into the same and having air ports at different levels, float means for opening and closing one of the air ports, a "wave" guard for the float means having a restricted gasoline port, and atmospheric pressure within it, manual means for opening and closing the air ports, and spring devices for controlling the air port opening and closing means.

In testimony whereof I affix my signature.

WILLIAM H. MUZZY.