J. P. FARRELL.

CARBURETER FEED SYSTEM.

APPLICATION FILED SEPT. 20, 1915.

1,245,893.

Patented Nov. 6, 1917.

Fig. 1.

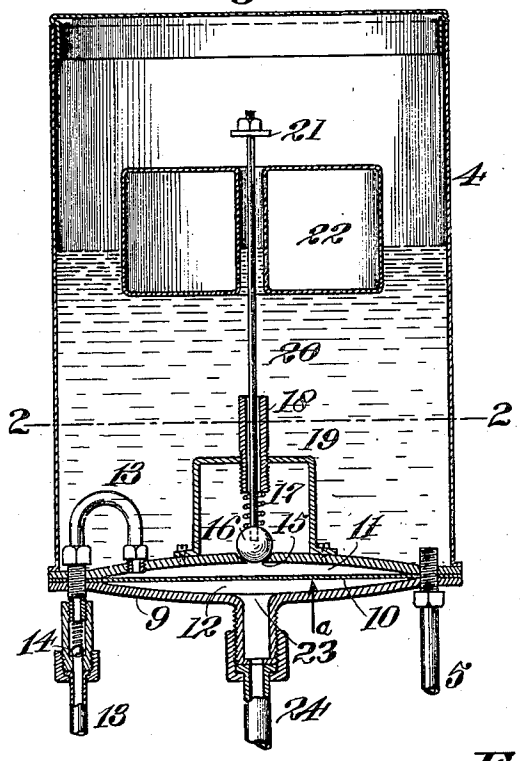


Fig. 2.

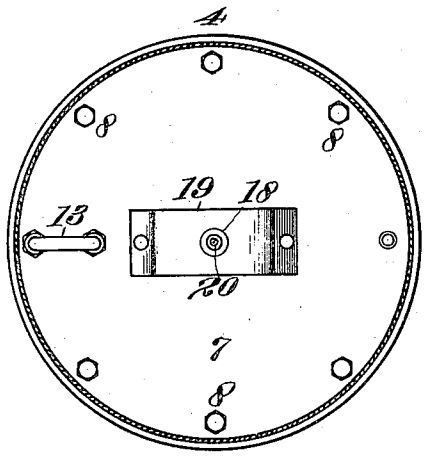
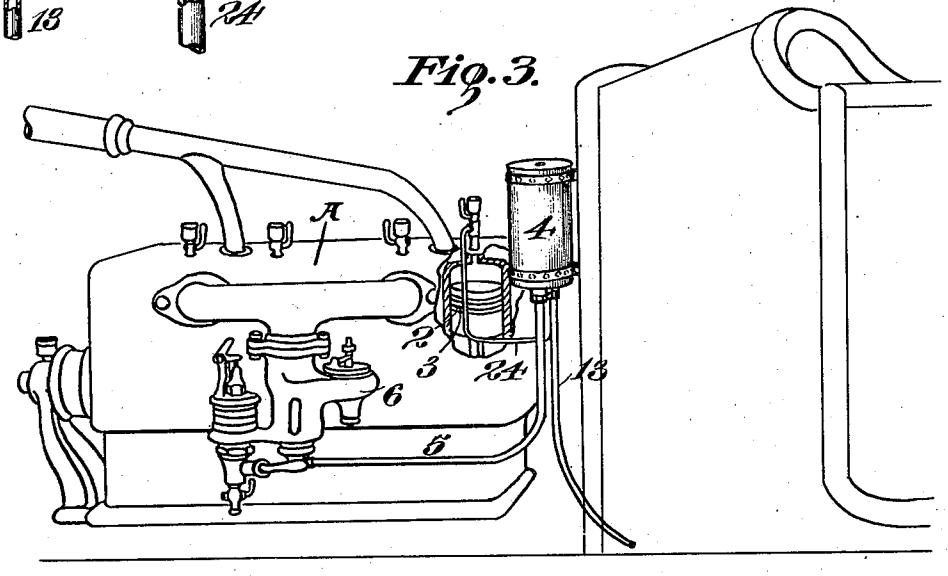


Fig. 3.



WITNESSES:

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CARBURETER-FEED SYSTEM.

1,245,893. Specification of Letters Patent. Patented Nov. 6, 1917.

Application filed September 20, 1915. Serial No. 51,586.

To all whom it may concern:

Be it known that I, JAMES P. FARRELL, a citizen of the United States, residing at the city and county of San Francisco and State of California, have invented new and useful Improvements in Carbureter-Feed Systems, of which the following is a specification.

This invention relates to a carbureter feed system.

One of the objects of the present invention is to provide an auxiliary tank or container for gasolene which is so positioned between the main supply tank and the engine on a car that the gasolene may be fed therefrom to the carbureter by gravity at all times. Another object of the invention, is to provide means connected with the engine and actuated by the pressure and suction produced therein for elevating the gasolene from the main supply tank to the auxiliary container. Further objects will hereinafter appear.

The invention consists of the parts and the construction and combination of parts, as hereinafter more fully described and claimed, having reference to the accompanying drawings in which—

Figure 1 is a central, vertical section through the auxiliary tank.

Fig. 2 is a cross section on line 2—2, Fig. 1.

Fig. 3 is a perspective view, showing the application of the invention.

Referring to the drawings in detail, A indicates an internal combustion engine; 2 one of the cylinders; 3 the piston operating therein, and 4 the auxiliary tank or container, from which gasolene is fed by gravity through a pipe 5, to the carbureter of the engine, indicated at 6. The auxiliary tank or container 4 is provided with a bottom section 7 of convex shape, exterior of which is secured by screws 8, or other suitable means, a similar shaped plate 9. Positioned between the bottom 7 and the plate 9, and secured between same is a flexible diaphragm 10, which divides the chamber formed between the two plates into two sections 11 and 12. Connected with the bottom 7 and communicating with chamber 11, is a pipe 13, the opposite end of which is connected with a gasolene supply tank, not here shown, and mounted in said pipe, as close as possible to the end thereof, as shown in Fig. 1, is a check valve 14, of suitable construction. Formed approximately in the center of the bottom plate 7, is an opening 15 which is tapered to form a seat to receive a check valve 16, which is normally held in position by means of a spring 17, interposed between the valve and an adjustable guide bushing 18, carried by a bracket 19 and secured to valve 16, and extending through and guided in bushing 18, is a valve stem 20, on the upper end of which is formed an adjustable stop 21. Surrounding the valve stem and slidably mounted on same, is a float 22 of suitable construction, which is elevated or lowered by the gasolene admitted to the tank 4. Connected with the lower end of the tank is the pipe 5, by which the gasolene is permitted to feed by gravity to the carbureter 6, and formed in the lower plate 9 and communicating with chamber 12, is an opening 23, to which is connected one end of a pipe 24, the opposite end of which communicates with the interior of cylinder 2. The direct communication between chamber 12 and cylinder 2, formed by pipe 24, permits the variable pressure produced in the cylinder, such as compression, explosion and suction to actuate the diaphragm 10, in this manner permitting this to act as a pump which will elevate gasolene from the main supply tank, not here shown, through pipe 13 into the auxiliary tank 4, as will hereinafter be described.

With the engine running, and the piston moving up on the compression stroke, it will be seen that a certain amount of gas under pressure is forced into chamber 12, where it causes the diaphragm 10 to expand or move in the direction of arrow *a*. The moment explosion takes place or a charge is fired, a still higher pressure is produced, which moves the diaphragm still farther in the direction, indicated. Any gasolene admitted through the pipe 13, from the main storage tank will then be forced through opening 15, by the valve 16 into the auxiliary tank 4. The pressure in cylinder 2, is however, gradually relieved as the exploded charge expands and the piston moves down, permitting the diaphragm to move in the opposite direction. This movement is further assisted when the piston moves down on the suction stroke, as a vacuum will then be produced, which is sufficient to not only return the diaphragm to normal position, but also

move it slightly beyond the normal plane in the opposite direction. The movement of the diaphragm away from the bottom section 7 produces a vacuum or sufficient suction in chamber 11, to close check valve 16 and open check valve 14, thus drawing a new charge of gasolene from the storage tank through pipe 13 into chamber 11; this charge of gasolene admitted is again discharged, when pressure is produced in the cylinder, both by compression and by firing of the charge in the cylinder, this causes the diaphragm to move in the direction of arrow *a*, closing check valve 14, and forcing check valve 16 open, thus permitting the charge of gasolene previously admitted to be discharged into the container or auxiliary tank 4, from where it is permitted to feed by gravity through pipe 5 to the carbureter. The supply of gasolene or contents of the auxiliary container 4, is regulated by the float valve 22, as the level of gasolene gradually increases or rises, it will be seen that the float will correspondingly rise and will finally engage the stop member 21, causing this to lift the stem 20 with connected valve 16, away from its seat 15. The gasolene in the auxiliary tank, will then circulate back and forth through opening 15 and no gasolene will be admitted through pipe 13, till a sufficient amount of gasolene has been consumed to lower the level in the auxiliary container, sufficiently to permit the valve 16 to engage its seat. The quantity or the level of the gasolene in the auxiliary container, is in this manner automatically maintained, while the engine is running, and the quantity of gasolene delivered to same is automatically regulated by the speed of the engine, as the diaphragm is reciprocated or expanded and contracted at a speed controlled by the engine. In other words, if the engine is running slow, a small quantity of gasolene will be delivered to the auxiliary container, while if the engine is running at a high speed, a proportionally greater quantity will be delivered.

The feeding device here shown, is simple and substantial in construction, can be easily attached to any car and needs no attention or adjustment, as it is automatically started or stopped in unison with the engine. The force or pressure from the engine is applied to one side of the diaphragm only, and as there is absolutely no connection between the lower and upper sides of the diaphragm, it will therefore, be impossible to dilute or foul the contents of the container. The gasolene is furthermore heated to a certain extent by the warm gases impinging against the lower side of the diaphragm, and is therefore, more easily vaporized when passed through the carbureter.

The device is only provided with two valves, and as these are constantly submerged and operated in a bath of gasolene, it can easily be seen, that the action is such, that any dirt or foreign matter will become easily destroyed if caught under the valves.

The materials and finish of the several parts of the device may be such as the judgment and experience of the manufacturer may dictate.

I wish it understood that various changes in form, proportions and minor details of construction may be resorted to within the scope of the appended claims, and that I do not wish to limit myself to the specific design and construction here shown.

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

1. An auxiliary feed tank having a bottom formed of a pair of horizontal connected concavo-convex plates arranged with their concave faces in confronting relation, the upper plate having a central valve seat, an inverted U-shaped bracket secured to upper plate over said seat and having its top perforated, a guide bushing threaded through said perforation so as to be vertically adjustable, the lower plate having a central inlet for connection to an engine, a horizontal diaphragm between said plates, a valve arranged in said seat, a valve stem connected to said valve and extending freely through the bushing, a coil spring encircling said stem and abutting the valve and lower end of the bushing, a carbureter supply pipe connected to the tank, a float for actuating the valve stem, and an inverted U-shaped gasolene supply pipe connected to the upper plate at one end to discharge on the upper side of the diaphragm and having its opposite end extending downwardly through said bottom of the tank.

2. An auxiliary feed tank having a bottom formed of a pair of horizontal concavo-convex plates each of substantially uniform thickness throughout arranged with their concave faces confronting, a valve seat on the upper plate, a tensioned valve in said seat, a float for actuating the valve, a diaphragm between the plates, a carbureter supply pipe having its upper end extending upwardly through both plates and into the tank, and a gasolene supply pipe extending upwardly through both plates and having its end connected to the top plate so as to discharge gasolene onto the upper face of the diaphragm.

3. An auxiliary feed tank having a bottom formed of a pair of horizontal connected concavo-convex plates arranged with their concave faces in confronting relation, the upper plate having a central valve seat, an inverted U-shaped bracket secured to the upper plate over said seat and having its top perforated, a guide bushing threaded through said perforation so as to be verti-

cally adjustable, the lower plate having a central inlet for connection to an engine, a horizontal diaphragm between said plates, a valve arranged in said seat, a valve stem connected to said valve and extending freely through the bushing, a coil spring encircling said stem and abutting the valve and lower end of the bushing, a carbureter supply pipe connected to the tank, a float for actuating the valve stem, and a gasolene supply pipe leading into the tank and discharging above the diaphragm and thereon.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JAMES P. FARRELL.

Witnesses:
W. W. HEALEY,
M. E. EWING.