Jan. 30, 1923. 1,443,428.

J. G. NOLEN.

AUXILIARY FUEL RESERVOIR.

FILED FEB. 23, 1922.

Fig. 1

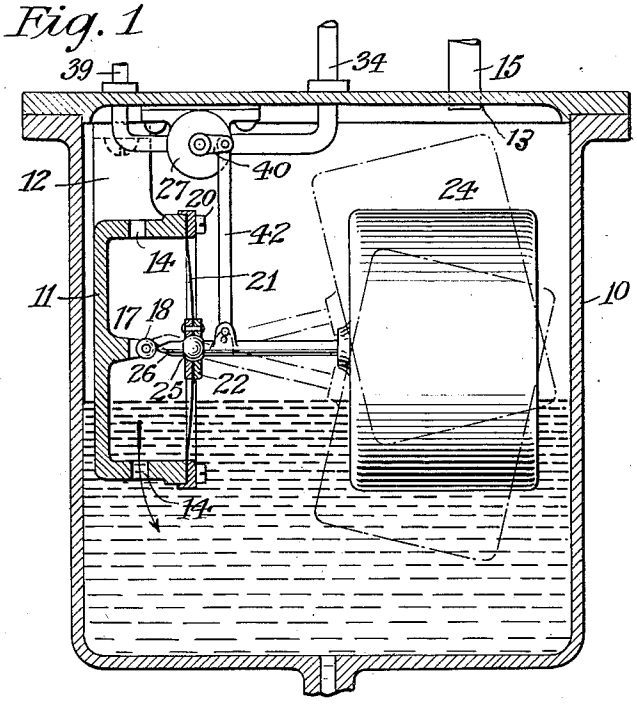


Fig. 3

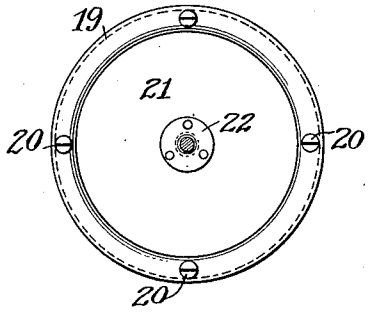


Fig. 2

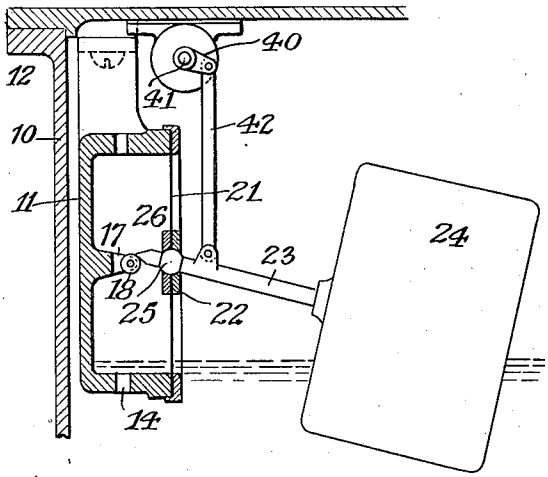


Fig. 4

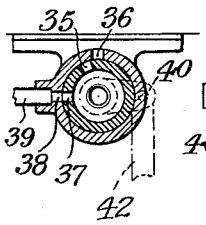
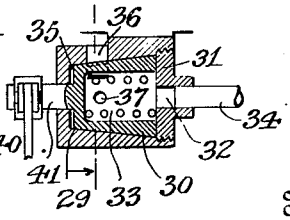


Fig. 5



Inventor

James G. Nolen

By his Attorney

Wm Bohleber

Patented Jan. 30, 1923. 1,443,428

UNITED STATES PATENT OFFICE.

JAMES G. NOLEN, OF NEW YORK, N. Y.

AUXILIARY FUEL RESERVOIR.

Application filed February 23, 1922. Serial No. 538,440.

To all whom it may concern:

Be it known that I, JAMES G. NOLEN, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Auxiliary Fuel Reservoirs, of which the following is a full, clear, and exact description.

The invention which constitutes the subject matter of this application relates to a fuel supply apparatus for internal combustion engines, particularly those engines employed upon motor vehicles and the like, said apparatus being of that type in which a main supply tank is employed from which the liquid fuel is raised by suction into an auxiliary reservoir from which it falls by gravity through a suitable discharge to the carburetor.

The present invention has more particularly to do with certain novel mechanism for controlling the admission of atmospheric air into the auxiliary reservoir above the fuel therein after the same has reached a predetermined level and for establishing a communication of the upper end of this reservoir with the pipe leading to the vacuum producing means of the engine.

Further objects, advantages and features of construction and operation will be more clearly apparent from the detailed description below taken in connection with the accompanying drawing in which:

Figure 1 is a central vertical section of the auxiliary reservoir showing the operative parts of the device, some of which are in cross section;

Figure 2 illustrates the position of the mechanism as the tank is being filled by virtue of the reduced pressure in the upper part of the reservoir;

Figure 3 illustrates a front view of the diaphragm bearing upon which the float rod is pivotally supported;

Figure 4 illustrates a cross section of the valve employed to establish communication between the reservoir and the vacuum producing means on the one hand and the reservoir and external atmosphere on the other;

Figure 5 is a longitudinal section of the valve illustrated in Figure 4.

Referring to the drawing in detail, the reference numeral 10 designates an auxiliary reservoir. This reservoir is preferably enclosed in a surrounding vessel which is not illustrated herein and which is always under atmospheric pressure. Within the reservoir 10 is a housing 11 suitably secured as by bracket 12 to the cover of said reservoir. The reservoir is provided with an inlet port 13 and the housing with ports 14. To the inlet port 13 is connected a pipe 15 leading to the main fuel supply tank. Centrally positioned on the interior of the housing is an arm 17 upon which an anti-friction roller 18 is mounted. To the front face of the housing is secured, as by an annular flange 19, and securing screws 20, a diaphragm 21 provided with a centrally located bearing 22 for the arm 23 of the float 24. The bearing 10 in connection with the enlarged portion 25 of the arm 23 constitutes a ball and socket connection of said arm with the diaphragm 10. Projecting from the enlargement 25 into the housing 11 is an extension 26 of the arm 23. This extension normally contacts with one side of the anti-friction roller 18, as clearly illustrated in Figure 2. However, when the float 24 raises, the extension rides over the anti-friction pressing the diaphragm 21 outwardly, so that when the extension 26 passes beyond the dead center of the anti-friction roller 18 it gives an impetus to the movement of the float, thus shutting off the vacuum and establishing communication between the upper end of the reservoir and the atmosphere through the valve 27 to be presently described.

The valve 27 comprises a casing 28 (see Figures 4 and 5), a conical seat 29, and a conical valve member 30 seated upon said seat 29. The enlarged end of the casing 28 is provided with a closure 31 screw-threaded or otherwise suitably secured thereto. This closure 31 is provided with a port indicated at 32, to establish communication with the cored-out portion 33 of the valve 30. One end of a pipe 34 is connected to the port 32, the other end of which is connected to a vacuum producing means suitably located on the engine. The valve 30 is provided with a port 35 adapted to register with a second port 36 in the casing 28 whenever the float 24 is in the upper dotted position indicated in Figure 1. The valve 30 is provided with a second port 37 which is adapted to register with a second port 38 in the casing 28 whenever the float 24 is in the

upper dotted position, thereby establishing communication between the upper portion of the reservoir and the atmospheric air through pipe 39. An arm 40 is mounted upon the stem 41 of the valve 30, which arm 40 is connected to the arm 23 of the float by means of a link 42.

Briefly stated, the operation is as follows: The normal position of the float, is indicated in Figure 1. When the fuel recedes in the tank the float falls proportionately passing over the dead center indicated in full lines in Figure 1, to the lower dotted line position indicated also in said figure, and also indicated in full lines in Figure 2. As the float passes dead center in its downward movement the ports 35 and 36 begin to register, thereby establishing communication between the upper end of the reservoir and the vacuum producing means through pipe 24. A reduction of pressure in the reservoir causes fuel to be fed from the fuel supply tank through pipe 15 into the reservoir. Simultaneously with the registering of the ports 35 and 36, the ports 37 and 38 will be moved to unregistering position, thus closing the reservoir to the atmospheric air. In filling, the reverse operations take place, as will be readily understood.

It is to be expressly understood that I do not limit myself to the exact construction herein shown and described, as many changes may be made in points of detail and other embodiments resorted to without deviating from the true spirit and scope of my invention.

What I claim is:

1. An auxiliary reservoir for receiving fuel from a main tank comprising a main supply pipe connected to the main tank, a suction pipe through which the air is exhausted from the reservoir, a pipe through which atmospheric pressure is admitted to the reservoir, a float provided with a stem or arm, an elastic member to which said float arm is pivoted, and means actuated by said float for simultaneously closing one of said pipes and opening the other and vice versa, said means comprising a single valve provided with ports adapted to register with the openings in said pipes.

2. The construction of a reservoir as defined by claim 1 in combination with means cooperating with the float arm for imparting an impulse to the valve in both of its movements.

3. An auxiliary reservoir for receiving fuel from a main supply tank comprising a main supply pipe connected to the main tank, a suction pipe through which the air is exhausted from the reservoir, a float provided with a stem or arm, an elastic member to which said float arm is pivoted, means actuated by the movement of said float for simultaneously closing one of said pipes and opening the other and vice versa, and means cooperating with the float stem for imparting a quick impulse to the float in opening and closing said pipes.

In testimony whereof, I have hereunto set my hand this 18th day of February, 1922.

JAMES G. NOLEN.