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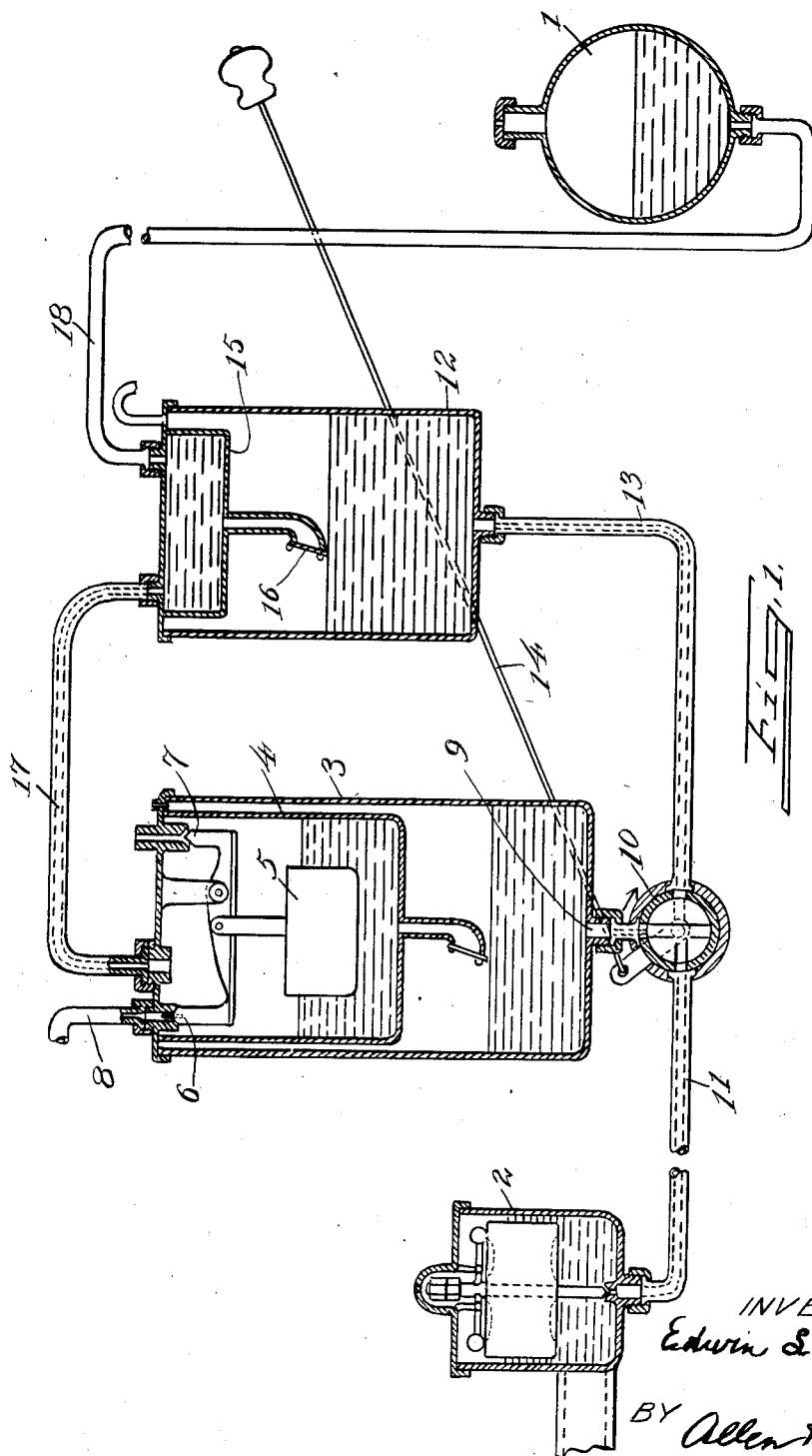
E. L. GRAUEL

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FUEL RESERVE DEVICE

Filed April 23, 1925

2 Sheets-Sheet 1



INVENTOR:

Edwin L. Grauel

BY

Allen & Allen

ATTORNEY.

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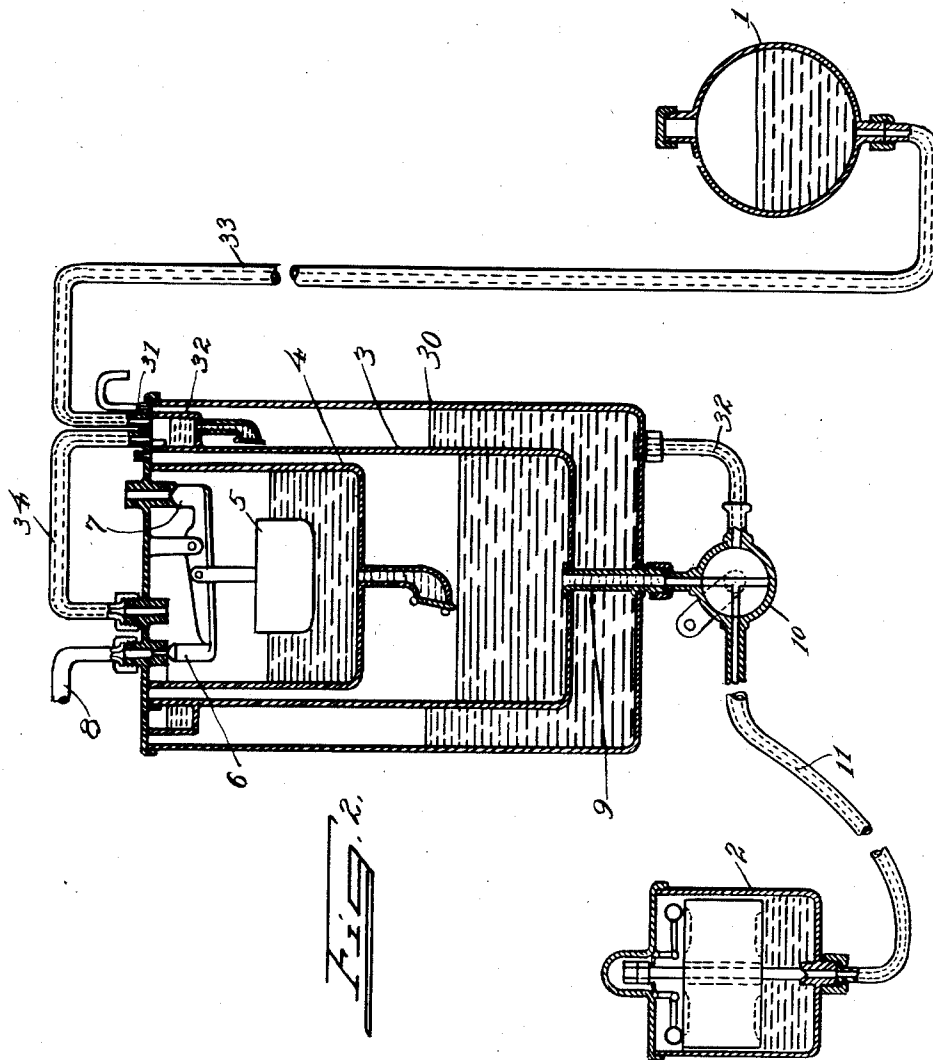
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INVENTOR:
Edwin L. Grauel

BY Allen & Allen
ATTORNEYS.

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UNITED STATES PATENT OFFICE.

EDWIN L. GRAUEL, OF CINCINNATI, OHIO, ASSIGNOR TO THE GRAULOCK COMPANY,
OF CINCINNATI, OHIO, A CORPORATION OF OHIO.

FUEL-RESERVE DEVICE.

Application filed April 23, 1925. Serial No. 25,441.

My invention relates to devices for reserve fuel supply in motor vehicles, as applied to those employing the vacuum feed system of fuel supply.

It is the object of my invention to provide a reserve fuel supply device which cannot be left empty, if the car is operating, and which requires the operator of the car to resort to his regular fuel supply at all times until the vacuum system becomes inoperative due to the supply in the main fuel reservoir becoming so low as to expose the end of the supply pipe to the atmosphere.

It may be observed that without the accomplishment of the objective above noted, a fuel reserve supply is not completely reliable, since if it can be used when the normal fuel supply is operative, the operator can empty his reserve supply by carelessness, so that it is not ready in an emergency. Also, if it were possible to do other than carry the reserve while the regular supply was being used, then the operator might fail to fill his reserve supply.

It is my object to accomplish the purposes outlined without departure from the ordinary vacuum system, and without danger of withdrawal of gasoline from the carburetor float chamber during the act of refilling the reserve supply chamber.

I accomplish my objects by that certain construction and arrangement of parts to be hereinafter more specifically pointed out and claimed.

In the drawings:

Figure 1 is a vertical section partially diagrammatic of one mode of constructing my device.

Figure 2 is a like view showing another mode.

The fuel supply tank is indicated at 1, and the carburetor at 2, having the usual float chamber. The vacuum system device is shown, in the two illustrated forms, as having a main tank 3, and upper control tank 4.

In the upper control tank is the float 5, controlling the valves 6 to the air suction line, and 7 to the atmosphere. The suction or reduced pressure is introduced into the upper tank at 8.

The lower tank has a pipe 9 leading to a three-way valve 10, from which valve a pipe 11 goes to the float chamber of the carburetor.

The reserve tank 12 in the first modification has a pipe 13 to the other port of the three-way valve. The operation of a rod 14 to the dash board of a motor vehicle shifts the valve to direct fuel from the vacuum system tank, or the reserve tank to the carburetor, but cannot be set to admit both supplies at the same time.

In the top of the reserve tank is arranged a small tank 15, opening through a check valve 16 into the main tank, and supplying liquid to the main tank in exactly the same way as the float tank to the main tank of the vacuum system proper.

The pipe 17 from the control tank of the vacuum system element passes into the upper tank 15 of the reserve, and the supply pipe 18 from the main fuel supply reservoir passes also into the small tank 15.

As soon as the fuel supply in the ordinary course, is exhausted from the main reservoir, the vacuum is broken in the supply line. The vacuum system will then cease to operate although suction is still kept in the line, as long as the engine turns over. The liquid in the lower portion of the reserve tank can then be used, by merely throwing over the valve.

The driver then fills his main supply tank at the nearest station, and starts his engine, still using the reserve supply. The suction line will then operate to draw liquid up through the pipes, the small tank 15, and into the float tank of the vacuum element.

The moment the small float tank of the vacuum system is filled, the float therein will shut off the suction, thereby permitting its contents to drop, and admitting air into the small tank of the reserve so that its contents fall into the main reserve tank. This air is admitted through the supply line from the main tank to the outlet pipe from the tank 15.

This condition will continue until the main vacuum system is filled up as to the lower or main tank portion, and the float finally closes off the vacuum system, and holds it closed, since the driver has not turned off the valve from his reserve supply.

As soon as the reserve supply is used up, the car will then stop, requiring the driver to shift the valve back again to his regular system.

The operation of the regular system will

then fill the reserve system, by the continual shutting off and opening up of the vacuum line, as is usual in the type of fuel feed in question.

5 Thus the reserve system must be filled after a very short period of use of the main system. The main system must be used when there is fuel in the main supply tank, as otherwise the car will stop because all
10 fuel is exhausted from the reserve. The reserve is kept full automatically, and ready for use. The suction in the main system will not hold up the fuel in the reserve tank, when the main tank is out of
15 fuel, because of the small upper tank. The lower or main reserve tank is always open to the atmosphere.

The modification is merely an adaptation permitting the use of a single unit, for supply and reserve. The parts of the regular
20 system are indicated by the same numerals as before. The reserve tank is the larger vessel 30, which has the air opening 31 and pipe 32 to the three-way valve. The small
25 vessel 15 is replaced by the annular vessel 32 on the outside of the main vacuum tank. The pipe 33 from the storage tank of fuel runs into the vessel 32, from which pipe 34 extends to the regular inlet into the vacuum
30 system tank.

It is evident that the amount of reserve is limited only by the size of the reserve tank, and that the small vessel in the reserve tank can be of as small a size as convenient to make.

The omission of the small tank within the reserve tank, and of the air hole therein, does not prove satisfactory on installation where the vacuum is strong enough to hold up the liquid in the reserve tank, after the main storage reservoir is empty. In such cases there will not be a regular flow of the fuel from the reserve tank, without provision of extra shut-off valves, which are naturally not desirable.

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

In combination with a vacuum supply tank having a fuel line to a supply, a suction
5 air line, and an air inlet, a float element to close the suction line and open the air inlet when the vacuum tank is full, a reserve trap in the fuel line, a reserve tank open to the
10 atmosphere and communicating through a
15 valved connection to the reserve trap, and a valve for directing fuel from the vacuum tank and the reserve tank, selectively to an engine using such fuel.

EDWIN L. GRAUEL.