

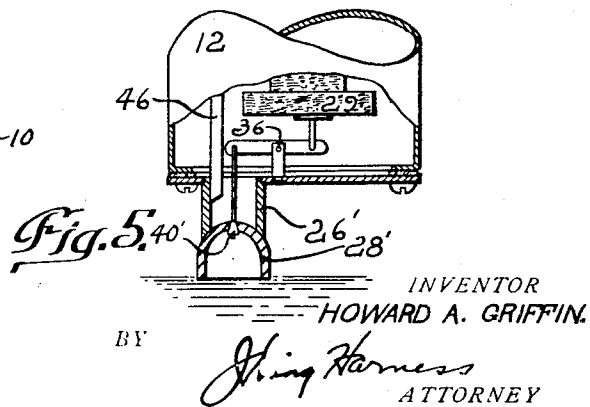
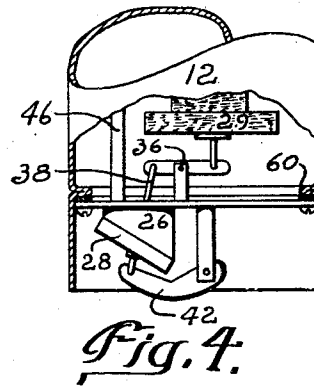
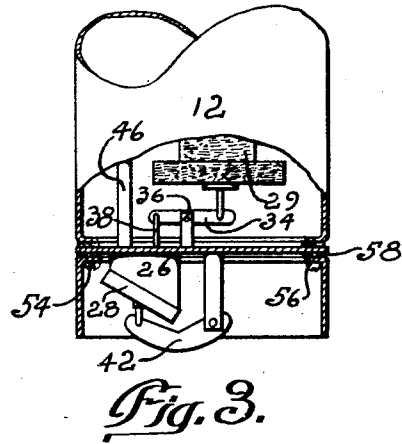
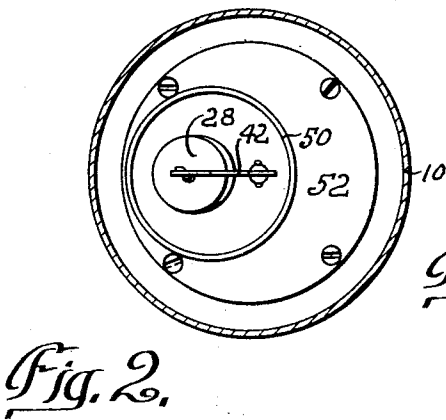
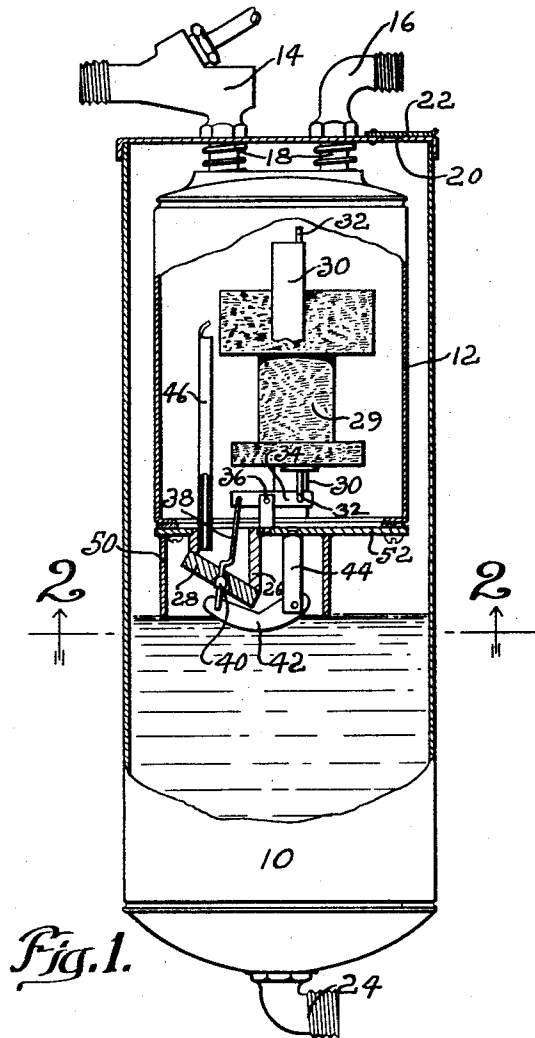
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VACUUM TANK

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VACUUM TANK

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This invention relates to a means for regulating a liquid level, and more particularly to a means for regulating the liquid level in a reserve chamber of a vacuum tank.

In the manufacturing of vacuum tanks, it is usual to provide a dump valve leading from the suction chamber to a reserve chamber below the suction chamber. The liquid level in the reserve chamber is usually above the dump valve. In some constructions the vent for the upper or vacuum chamber is taken from the reserve chamber, open to atmospheric pressure, through the dump valve. When the dump valve is submerged in liquid and opened, the air admitted through the valve to the vacuum chamber causes a whistle as it passes through the liquid into the valve.

An important object of this invention is to lower the liquid level in the reserve chamber by an inexpensive means so that the dump valve is not submerged in the liquid. When the liquid is prevented from reaching this height, the disagreeable noise is no longer present.

Another object of the invention is to provide an air chamber around the dump valve, the level of the liquid sealing the chamber and providing a dead air space which prevents the liquid from raising to a level around the valve.

Other objects and advantages of the invention will more fully appear from the following description taken in connection with the accompanying drawings, in which:

Fig. 1 is a side view of a conventional vacuum tank, parts being broken away and in section.

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1 looking in the direction indicated by the arrows.

Fig. 3 is a front view of the lower end of the vacuum chamber showing a modification of my invention.

Fig. 4 is a view corresponding to Fig. 3 showing another modification of my device.

Fig. 5 is a view showing a further modification of my invention, parts being broken away and in section.

Referring to the drawings, I have shown an outer, lower tank 10 forming what has

been termed the reserve chamber and an inner upper tank 12 forming the vacuum chamber. The inner tank 12 is provided with a suction passage 14 adapted to form a communication between the tank 12 and a source of suction such as engine intake manifold, not shown. A liquid inlet passage 16 forms a communication between the tank 12 and a source of liquid such as the gasoline supply tank of an automobile. Parts 18, one on each of the passages 14 and 16, extend through the upper wall of the tank 10 and are received in the upper wall of the tank 12, forming a means for suspending the upper tank 12 within the tank 10. The tank 10 has an opening 20 in its upper face through which the tank may be filled with a liquid and through which air may be admitted forming a vent for the reserve tank 10. A loosely fitting cap 22 covers the opening 20 to prevent dirt from entering therethrough but permits air to be admitted to the tank 10 to maintain atmospheric pressure within the tank.

In the bottom wall of the tank 12, a cylindrical sleeve 26 has been provided forming a valve seat and a communication between the two tanks 10 and 12. At the under side of the sleeve 26 a flat disc is loosely supported on a suitable linkage connected to a float 29. The float 29 is guided for vertical movement by the side legs 30 of a U shaped member which is mounted on a rod 32 which extends through an opening in the horizontal portion of the U shaped member. The rod 32 extends through the float and the lower end thereof is pivotally connected at one end on an arm 34 which in turn is pivoted at its center as shown at 36. The opposite end of the arm 34 is provided with a link 38 extended downwardly therefrom through a small opening or valve seat in the valve 28. On the link 38 and below the valve 28 is a small valve 40 adapted for closing the opening through the valve 28. After the opening through the valve 28 has been closed, further movement of the float and linkage causes closing of the valve 28. The lower end of the link 38 is pivoted to a link 42 which in turn is pivoted to a rigid depending arm 44.

Within the sleeve 26 and extending upwardly into the tank 12, I have provided a pipe 46 which, when the valve 28 is open, forms a communication between the two tanks 10 and 12 for the passage of air from the tank 10, under atmospheric pressure, to the tank 12.

It will be understood that when the tank 12 has been filled with liquid by the suction through the connection 15, the float is in its raised position with the valve 40 and 28 away from the seats. Air then passes through the pipe 46 serving as a vent for the upper chamber and the liquid flows into the reserve chamber ready for delivery by gravity into the carburetor.

Heretofore, the valves 28 and 40 have been submerged in the liquid and when the valve 40 has been opened, the air and liquid being drawn through the tank 12 past the valve 40, causes a disagreeable noise. It has been found that by lowering the liquid level away from the valve 40 the noise is no longer present.

In Fig. 1 I have shown a cylindrical sleeve 50 soldered or otherwise secured to the lower surface of the tank 12 around the valves 28 and 40. The lower end of the sleeve projects slightly below the valves forming an air chamber. When the liquid level in the tank 12 reaches the lower edge of the sleeve 50, the liquid seals the chamber formed by the sleeve making a dead air space around the valve. By such a device the liquid level never reaches the valve and consequently only air is drawn through into the tank 12 when the valve 40 is opened.

The sleeve may be secured to a plate 52 which is detachably secured to the lower surface of the tank 12, forming the bottom wall of the tank. By this arrangement it is possible to reduce the diameter of the sleeve. In other forms of my device the sleeve may be provided with a flange 54 as shown in Fig. 3 and secured to the under surface by the tank 12 by the same screws 56 which hold the bottom plate on the tank 12, a gasket being provided between the sleeve and plate 52 to make the connection air tight. As shown in Fig. 4, the cylindrical wall of the tank 12 is provided with a rib 60 above the lower open end of the tank and the plate 52 carrying the valve and float mechanism is secured to the rib 60. The rib 60 in this form has been rolled in the side walls of the tank.

In Fig. 5 I have illustrated a form of my device in which the air tight chamber has been formed on the valve. The sleeve 26' in this form of my device forms a seat for a semi-spherical valve 28' which also is the seat for the valve 40'. It will be understood that the valve 28' forms an air tight chamber and keeps the liquid level from reaching the valve 40'. In this construction many of the parts

have been eliminated and the construction is ideal for an inexpensive device.

It will be understood that various forms of my device, including changes in the size and arrangement of parts, may be made without departing from the spirit of my invention, and it is not my intention to limit its scope other than by the terms of the appended claims.

What I claim is:

1. In a vacuum tank, the combination of an upper vacuum chamber having a passage in the bottom wall thereof, a reserve chamber below said vacuum chamber and open to atmospheric pressure, a pipe in said passage extending upwardly in said suction chamber forming a vent to said suction chamber from said reserve chamber, a valve in said passage for closing said passage and said vent, and means for maintaining the liquid level in said reserve chamber below said valve.

2. In a vacuum tank, the combination of an upper vacuum chamber, a reserve chamber below said vacuum chamber and open to atmospheric pressure, said vacuum chamber having a passage forming a communication between said chambers, a valve for said passage, means for forming an air passage from said reserve chamber to said suction chamber within said passage and above said valve, a small valve within said first mentioned valve, and a depending flange around and extending below said last named valve, said flange forming an air tight chamber around said valve when the liquid level in said reserve tank reaches the open end of said flange.

3. A device of the class described comprising an upper chamber, a lower chamber, a passage forming a communication between said chambers, a valve for said passage having an opening, a valve for said opening, and means for preventing the liquid level in said reserve chamber from reaching said last named valve.

4. A device of the class described comprising an upper chamber, a lower chamber, a valve in the bottom of said upper chamber, a valve in said last named valve, and a depending flange on said first named valve and extending below said second named valve.

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