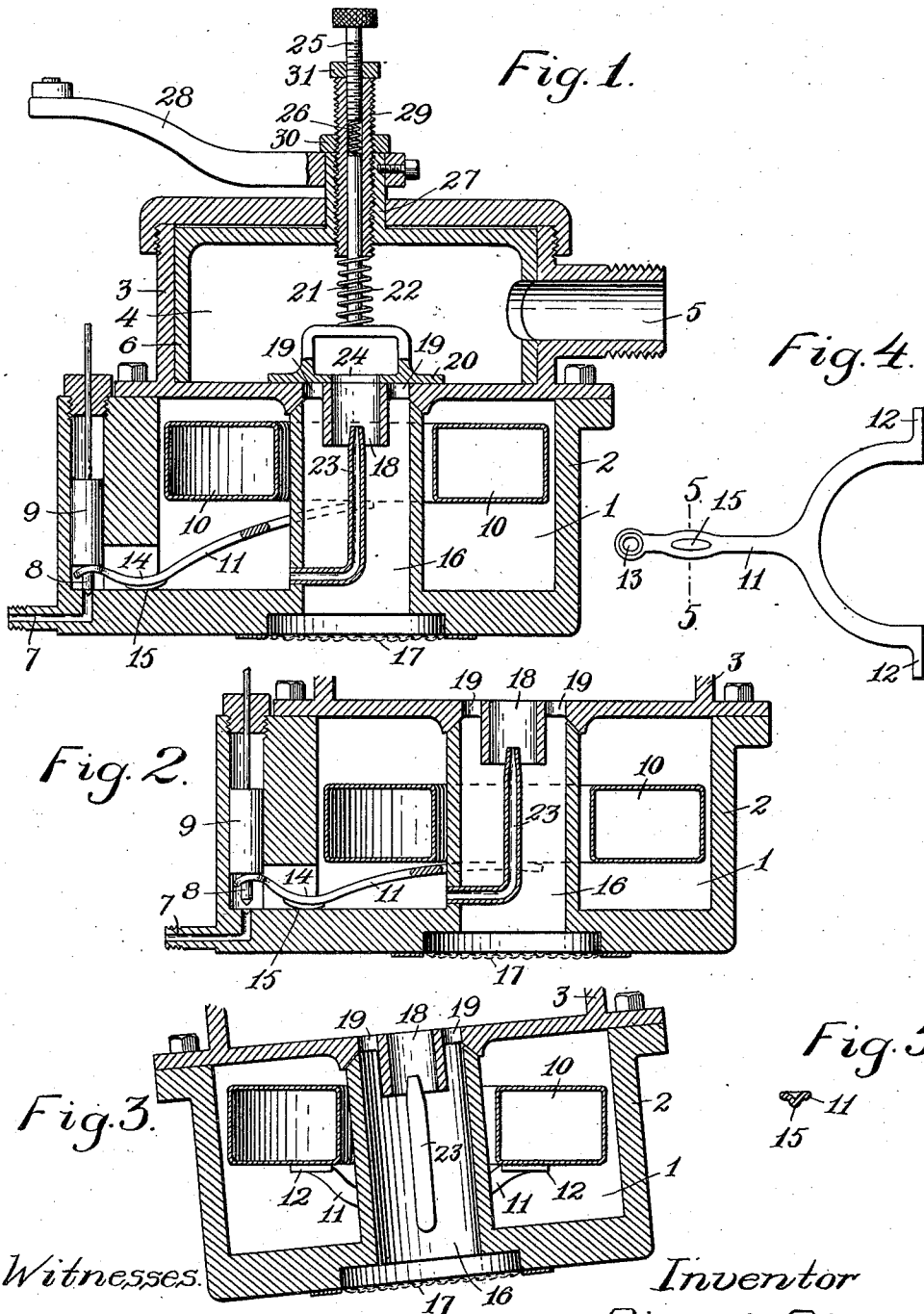


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LIQUID LEVEL CONTROLLING APPARATUS.
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Patented July 1, 1913.



Witnesses.

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LIQUID-LEVEL-CONTROLLING APPARATUS.

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To all whom it may concern:

Be it known that I, RIENZI RICE, a citizen of the United States, residing at Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in Liquid-Level-Controlling Apparatus, of which the following is a specification, accompanied by drawings forming a part of the same, in which—

Figure 1 represents a central, vertical sectional view of my improved liquid level controlling apparatus applied to a carbureter, with the float in a raised position. Fig. 2 is a central vertical sectional view of the float chamber, the section showing the float in a lower position than that shown in Fig. 1. Fig. 3 is a central vertical sectional view of the float chamber in a plane at right angles to that shown in Figs. 1 and 2, but with the carbureter tipped. Fig. 4 is a detached plan view of the rocking lever which operatively connects the float with the entrance valve to the float chamber. Fig. 5 is a transverse section of the lever 11 on the line 5—5, Fig. 4.

Similar reference letters and figures refer to similar parts in the different views.

My invention relates to apparatus for maintaining the liquid in a receptacle at a certain level, said apparatus being arranged to operate an entrance valve when the liquid falls below the desired level and to close the valve when the level is attained, and it consists in the construction and arrangement of parts as hereinafter described and pointed out in the annexed claims.

Referring to the accompanying drawings in which my improved apparatus is shown applied to a carbureter 1 denotes the reservoir chamber inclosed in the cup shaped shell 2, mounted upon which is a cup shaped shell 3 inclosing a charging chamber 4, the charge being delivered through an orifice 5 and controlled by a rotatable cup shaped valve or gate 6, in the usual manner in devices of this class. A hydrocarbon liquid or other material which is to be vaporized is supplied to the chamber 1 from a tank or convenient source of supply through a passage 7, which is controlled by a needle valve 8 carrying a weight 9 and arranged to act by gravity to close the passage 7. The reservoir chamber 1 contains a hollow float 10 which floats upon the liquid contained in the

chamber 1, and as the float sinks, due to the exhaustion of the liquid in the chamber 1, it bears upon a rocking lever 11, one end of which incloses the needle valve 8 and the opposite end is bifurcated and preferably provided with prongs 12, 12, which bear against the under side of the float 10. The end of the rocking lever 11 is provided at one end with an eye 13 which incloses the needle valve 8, and near the eye 13 the lever is bent downward at 14 and is provided on its under side with a short curved rib 15 which permits the lever 11 to rock freely both longitudinally and transversely.

When the carbureter is held in a level position and the float 10 supported horizontally by the contained liquid, the float will bear evenly upon the prongs 12, 12, and as the float descends it will rock the lever 11 longitudinally on the rib 15, causing the weight of the float to overcome the weight 9 of the needle valve and lift the latter to open the passage 7 and permit the flow of liquid into the reservoir chamber 1. If, however, the carbureter be tipped, as shown in Fig. 3, the float 10 will be still maintained in a horizontal position by the liquid contained in the reservoir, the rocking lever 11 will be tipped or rocked transversely, one of the prongs 12 being depressed lower than the opposite prong 12, as shown in Fig. 3. The double rocking motion of the lever 11 enables the float to act as a weight upon the prongs 12, 12, and operate the needle valve 8 equally whether the carbureter is held in a horizontal position or tipped to one side as shown in Fig. 3. As the liquid in the reservoir 1 rises to the desired level the float 10 is lifted, allowing the weight 9 of the needle valve to close the valve and prevent the further entrance of liquid to the reservoir. Concentric with the reservoir 1 is a tubular passage 16 open at the bottom to the outside air, and preferably provided with a cover 17 of gauze. The tubular passage 16 normally communicates by a tubular passage 18 with the charging chamber 4. The passage 18, however, is less in diameter than the passage 16 so as to restrict the flow of air into the charging chamber 4. Additional means, however, are provided for the flow of air into the charging chamber by means of openings 19, 19, arranged around the tubular passage 18 and normally closed by a valve plate 20 carried by a valve stem

21, and normally held in its lowest position to close the openings 19 by means of a spiral spring 22.

During the operation of the combustion engine, air is exhausted from the chamber 4, which is again resupplied through the tubular passages 16 and 18, and also causing a lifting of the valve 20 so as to open the passages 19. The upward draft of air into the chamber 4 and through the tubular passage 18 induces a blast of liquid in the form of a spray from the reservoir 1 through a pipe 23, thereby carbureting the air in the charged chamber 4 by an intimate mixture therewith with the hydrocarbon liquid received through the pipe 23. As the valve plate 20 is lifted the extra charge of air passing upward through the openings 19, 19, will be admitted to the chamber 4 around the outer edges of the valve plate 20, and also through its central opening 24. The extra charge of air admitted to the chamber 4 will therefore be determined by the height to which the valve plate 20 is raised. The height to which the valve 20 is raised is determined by means of an adjusting screw 25 and in order to prevent a sharp blow of the valve stem 21 against the end of the adjusting screw I preferably interpose a light spiral spring 26.

The rotatable gate valve 6 is provided with a hub 27 to which a lever 28 is attached by which the gate valve is operated from any convenient position by means of connecting mechanism, such as is now employed in automobiles, for the purpose of regulating the flow of carbureted air to the engine. The hub 27 is provided with an internal screwthread to receive a screw 29, against the lower end of which the spring 22 bears. Raising and lowering the screw 29 varies the tension of the spring 22. The screw 29 is hollow to receive the valve stem 21, adjusting screw 25 and spring 26, and the position of the screws 29 and 25 are adjusted in order to regulate the tension of the spring 22 and also to determine the amount

of lift of the valve plate 20, and the adjusting screws are then held by check nuts 30 and 31.

I claim,

1. A liquid level controlling apparatus, comprising a reservoir chamber with an inlet passage, a gravity valve tending to close said inlet passage, a float in said reservoir chamber, and a rocking lever operatively connecting said float and said gravity valve, said lever being bent downward near said gravity valve and having a projection on the lower side arranged to support said rocking lever and provided with a surface curved both longitudinally and transversely to said lever, whereby said lever is capable of a rocking movement in any direction.

2. A liquid level controlling apparatus, comprising a rocking lever, a float at one end of said lever, a gravity valve connected with the other end of said lever, a projection from said lever having a supporting surface curved in two directions at right angles to each other forming a fulcrum for said lever, thereby permitting a rocking movement of said lever in different directions and allowing the operation of said valve whether the receptacle containing the liquid is horizontal or inclined.

3. The combination with a reservoir chamber having an inlet passage, of a gravity valve tending to close said inlet passage, a float arranged to float upon the liquid contained in said chamber, and a rocking lever, one end of said lever being underneath said float and the other end being connected with said valve, said lever being bent downward near said valve and provided on its under side with a rib curved both longitudinally and transversely to said lever, thereby providing for the operation of said valve by the rocking movement of said lever whether said chamber is horizontal or inclined.

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Witnesses:

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