Oct. 17, 1933. W. A. HANSEN 1,930,954

AUTOMATIC SHUT-OFF FOR FILLING SPOUTS

Filed Sept. 22, 1930

Fig. 1.

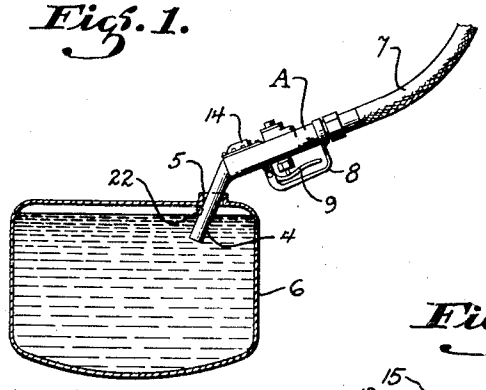


Fig. 4.

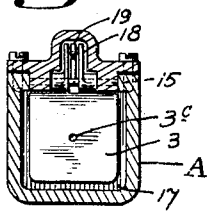


Fig. 5.

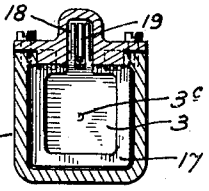


Fig. 2.

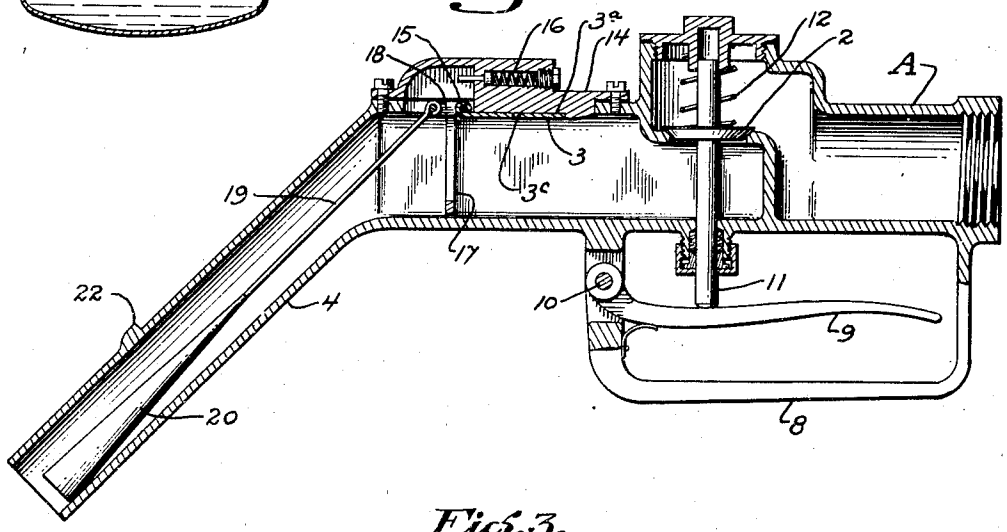
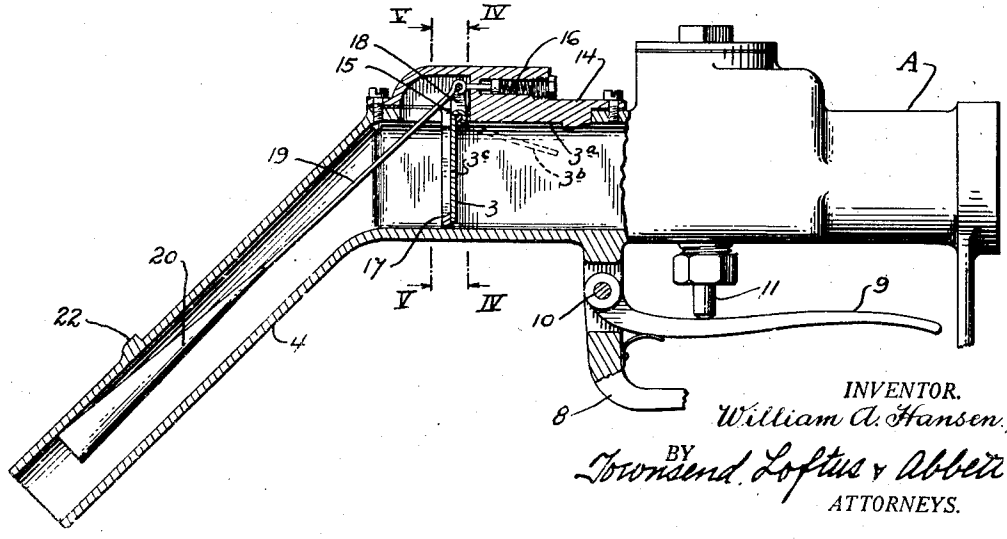


Fig. 3.



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AUTOMATIC SHUT-OFF FOR FILLING SPOUTS

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6 Claims. (Cl. 226—127)

This invention relates to filling spouts such as used in service stations and the like, and especially to an automatic shut-off valve whereby the flow of gasolene through the valve is stopped when the tank is full.

In the operation of automobile service stations considerable trouble is encountered when filling the tanks of different automobiles in preventing overflow as the capacity of different tanks varies and the liquid level indicating mechanism employed is often unreliable. Such overflow is a source of waste and it is a decided source of fire hazard.

The object of the present invention is to generally improve and simplify the construction and operation of filling spouts such as used in service stations and the like, and particularly to provide a filling spout which is insertable in the filling opening of a tank, or the like, and which will automatically shut-off the flow of gasolene when a predetermined liquid level is obtained in the tank.

The filling spout is shown by way of illustration in the accompanying drawing, in which—

Fig. 1 is a side elevation of the filling spout as attached to a hose and showing it inserted in a tank to be filled,

Fig. 2 is an enlarged central, vertical, longitudinal section through the filling spout,

Fig. 3 is a similar section showing the automatic shut-off valve in closed position,

Fig. 4 is a cross section taken on line IV—IV of Fig. 3,

Fig. 5 is a cross section taken on line V—V of Fig. 3.

Referring to the drawing in detail and particularly Figs. 1, 2 and 3, A indicates a housing in which is mounted a manually controlled valve 2, an automatic shut-off valve 3, and which terminates in a filling spout 4 which is adapted to be inserted through a filling opening 5 into a tank such as indicated at 6. The filling spout here shown is particularly intended for automobile service stations and as such is attached to a hose 7 which in turn is connected with a source of gasolene supply, or the like. The housing A is provided with a hand guard 8 which encloses an operating handle 9. This is pivoted as at 10 and engages the stem 11 of valve 2. When the filling spout is inserted in the tank as shown in Fig. 1, the operator is only required to pull upwardly on the handle 9 and in so doing opens valve 2 and thereby permits a flow of gasolene through the hose and spout 4 into the tank and when the tank is full handle 9 is released and valve 2 will be automatically closed by means of a spring 12.

In actual operation when an automobile enters a service station the driver often specifies five gallons, ten gallons, etc. In that case the service station operator delivers the amount specified by holding valve 2 open until five or ten gallons have been delivered. In such cases overflow is not apt to take place as the driver of the automobile usually knows the capacity of his tank. There are many instances however in which an automobile driver enters and merely requests that the tank be filled. The service station operator does not know how many gallons are in the tank, nor does he know the capacity, hence it is up to him to carefully watch as he is filling the tank so that overflow will not take place. This can be accomplished during daylight hours but not so during dusk or dark even though the service station be well illuminated as the filling spout substantially fills the filling opening of a tank, hence letting in so little light that it is almost impossible for the operator to tell when the tank is full and the result is an overflow with accompanying waste and fire hazard. This difficulty has been obviated entirely in the present instance by providing the automatic shut-off valve indicated at 3. This is constructed and operated as follows:

Formed in the housing A just forwardly of the valve 2 is an opening which is closed by means of a cover plate 14. This cover plate forms a pivotal support 15 for the valve 3. It is provided with a recess 3a in which the valve is normally retained and is further provided with a spring 16 which is adapted to be placed under compression when valve 3 is closed. The plate 14 is further provided with a downwardly extending substantially U-shaped valve seat member 17 against which the valve closes and the valve proper is provided with a crank arm 18 which is connected through means of a link 19 with a float 20.

The operation of this part of the mechanism will be as follows: By referring to Figs. 1, 2 and 3, it will be noted that the spout 4 is provided with a lug 22. This lug determines the distance which the spout is inserted in the tank, that is, the operator first inserts the spout through the filling opening 5 and he then inclines it and pulls it upwardly until the lug 22 engages the underside of the tank. He then opens valve 2 by pulling upwardly on the handle 9 and the tank will thus be gradually filled. As the liquid level rises it will finally reach a point such as indicated in Fig. 1 where it enters the spout and causes flotation of the float 20. This will accordingly tend to rise or move upwardly in the

spout and such movement is transmitted through the link 19 and crank arm 18 to swing the valve 3 away from its normal open position or recess 3a. The moment it swings slightly outwardly from the seat, for instance into the dotted line position indicated at 3b, the rush of liquid or gasolene passing through the housing A impinges on the valve and swings it with considerable force to the closed position shown in Fig. 3. The flow of gasolene through the spout is accordingly instantly and automatically shut off the moment a predetermined level is reached and valve 2 is at the same time closed by releasing handle 9. A certain amount of liquid will under these conditions be trapped between the valves 2 and 3. It is obviously desirable to get rid of this liquid by draining it into the tank and this is accomplished by providing a drain opening 3c in the valve 3. The liquid leaks through this opening into the spout and the moment pressure is relieved spring 16, which was compressed during the closing movement of the valve, will exert its pressure and thereby swing the valve to substantially open position. In fact, return of the valve 3 to normal or open position is furthermore accomplished by the operator partially removing the spout or at least lifting it with relation to the filling opening 5 of the tank. That is, valve 3 closes with such force as to give an audible click and the moment the operator hears this, or sees the hand on the dial stop, or that the flow of gasolene from the visible tank is stopped, he merely releases handle 9 and unhooks the lug 22 with relation to the inner surface of the tank and lifts the spout upwardly in the filling opening. When he does so he lowers the liquid level within the spout thereby permitting the float to drop outwardly and as the pressure on the liquid trapped between the valves is almost instantly relieved by leakage both the float 20 and the spring will combine to swing the valve to normal or open position and thus permit complete drainage of the trapped liquid. Leakage to remove pressure is also obtained around the valve seat member 17. This member is formed as a part of the plate 14 and merely projects into the housing A. A close fit between the valve seat member 17 and the housing is not made, hence there is leakage not only through the opening 3c but also around the valve seat member 17 thus quickly relieving the pressure and permitting opening of the valve and complete drainage before the spout is removed.

The filling spout and the automatic actuated valve mounted therein has, in this instance, been described as particularly intended for use in gasolene service stations and the like. It should be obvious, however, that it may be used wherever containers are to be filled and where it is desired to automatically shut off the flow when a predetermined liquid level is obtained in the container.

While certain features of the present invention are more or less specifically described, I wish it understood that various changes may be resorted to within the scope of the appended claims. Similarly, that the materials and finishes of the several parts employed may be such as the manufacturer may decide, or varying conditions or uses may demand.

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

1. A device of the character described comprising a housing terminating in a filling spout, a manually actuated valve in the housing controlling the flow of a liquid through the housing and spout, a second valve in the housing positioned between the spout and the manually actuated valve, a float in the spout, a connection between the float and the second named valve whereby movement of the float is transmitted to close the second named valve, said valve having a leakage opening for releasing pressure on liquid trapped between the valves, and spring actuated means for opening the second named valve when pressure is relieved and to permit substantial drainage through the spout of the trapped liquid.

2. A device of the character described comprising a housing terminating in a filling spout, a manually actuated valve in the housing controlling the flow of liquid through the housing and spout, a second valve in the housing, a float in the spout, a connection between the float and the second named valve whereby movement of the float is transmitted to open and close the second named valve, said float normally urging the second named valve to an open position.

3. A device of the character described comprising a housing terminating in a filling spout, a manually actuated valve in the housing controlling the flow of liquid through the housing and spout, a second valve in the housing, a float in the spout, a connection between the float and the second named valve whereby rising movement of the float is transmitted to close the second named valve, and means brought into operation by rising of the float for automatically opening the second named valve after it has been closed.

4. A device of the character described comprising a housing terminating in a filling spout, a manually actuated valve in the housing controlling the flow of liquid through the housing and the spout, a second valve in the housing, a float in the spout, a connection between the float and the second named valve whereby rising movement of the float is transmitted to close the second named valve and means for automatically releasing the pressure of the liquid trapped between the first and second named valves and for automatically opening the second named valve.

5. A device of the character described, comprising a filling spout, a valve controlling the flow of liquid through said spout, a float, connections between the float and valve whereby rising of the float will close the valve, and means brought into operation by rising of the float and tending to open the valve immediately after it has closed.

6. A device of the character described, comprising a filling spout, a valve controlling the flow of liquid through said spout, a float and a pivotal connection between said float and valve, whereby rising of the float will close the valve, and lowering of the float will open the valve and retain it in an open position and resilient means for assisting the opening movement of the valve.

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