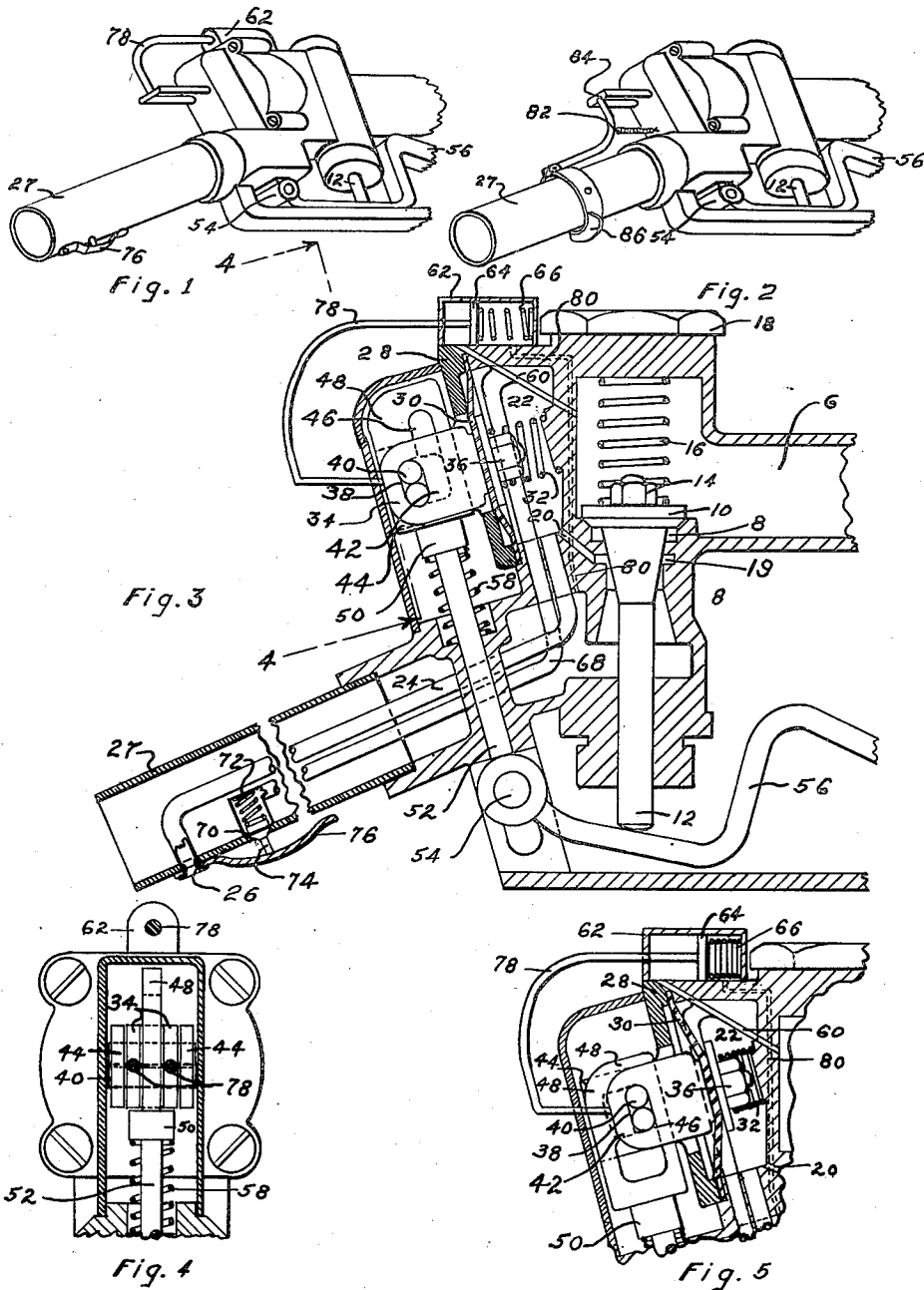


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R. L. CHADIL ET AL
SELF-CLOSING FILLING NOZZLE

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SELF-CLOSING FILLING NOZZLE

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This invention relates generally to filling nozzles which are employed to supply fluid to various types of containers. It relates more particularly to an improvement in filling nozzles which will minimize the danger of spilled gasoline when the nozzle is in the hands of a careless operator. The improvement is particularly adaptable to be utilized with that type of high-speed filling nozzle with automatic shut-off shown in Patent No. 2,320,033, dated May 25, 1943.

It is a primary object of this invention to provide an improved filling nozzle which will not discharge liquid until the actual discharge opening of the nozzle is inserted into the container.

It is an object of approximately equal importance to provide a filling nozzle whose discharge will be automatically stopped when the nozzle is withdrawn from the container being filled.

It is a third object of the invention to provide a filling nozzle which has, in addition to the ordinary manual control for its discharge, additional automatic control either of a simple mechanical type or a slightly more complex hydraulic type for preventing utilization of the manual control until that time when the nozzle is in correct position for filling a container.

It is yet another object of the invention to provide a filling nozzle which cannot be actuated to discharge indiscriminately the liquid whereby increased safety is obtained when a fluid such as gasoline is being discharged from the nozzle when in the hands of a somewhat careless operator.

These and other important objects will be made apparent from a study of the following specification and the accompanying drawings. The invention, in a preferred form, is illustrated in the drawings and hereinafter more fully described.

In the drawings:

Figure 1 is a perspective view of the improved filling nozzle in its form when hydraulically actuated.

Figure 2 is a similar perspective view, but differing in that it incorporates simple mechanical means.

Figure 3 is a sectional view of the hydraulically actuated improvement shown in conjunction with the remainder of the nozzle.

Figure 4 is a sectional view taken on the line 4-4 of Figure 3.

Figure 5 is a sectional view showing the hydraulically actuated control in position to de-actuate the manual control.

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As shown in the drawings:

The numeral 6 indicates generally the inlet portion of a filling nozzle which is supplied with fluid from an attached hose and pump mechanism. A valve seat 8 encompasses a valve disc 10 which is held on a downwardly extending valve stem 12 by means of nut 14. A compressed spring 16 serves to maintain the valve disc 10 on its seat 8 through reaction against a plug 18 which closes the other end of the valve body.

A Venturi opening 19 is disposed downstream from the valve seat 8 and a passage 20 connects this opening with a chamber 22 which comprises a further portion of the valve body. The chamber 22 is connected by a second passageway or pipe 24 whose internal diameter is larger than that of the first passage 20, to a discharge orifice 26 in the side of the discharge tube 27 of the nozzle. A sealing ring 28 holds a flexible diaphragm 30 against the valve body, thus effectively sealing the chamber 22. A compressed spring 32 is disposed within the chamber 22 engaging the valve body and the diaphragm 30. A divided actuating member 34 is connected exterior to the diaphragm, being held fixed to the diaphragm 30 by a bolt 36. The spring 32 tends to force the diaphragm 30 and the actuator 34 into the position shown in Figure 3. A slot 38 in the actuating member 34 serves to encompass a pair of rollers 40, which rollers also extend through an opening 42 in ears 44 which are formed integral with the sealing ring 28. The rollers 40 also extend through an L-shaped slot 46 in cam head 48, which head is centrally located between the divisions of the actuating member 34 and also between the stationary ears 44.

The head 48 is carried on a lug 50 which is pinned to a stem 52 which extends through the valve body and has exterior thereto, pivoted as at 54, a manually operated handle 56. A spring 58 is disposed to press upwardly against the hub 50, thus tending to maintain the cam head 48 in the position shown in Figure 3. As shown in Figure 3, the rollers 40 are positioned in the smaller portion of the L-shaped slot of the cam head 48 and since they are held stationary with the valve body by ears 44, downward stress on the pivot stem 52 will not cause movement in that direction.

A fluid passage 60 extends from the upstream side of the main valve 10 to that portion of a cylinder 62 which is hydraulically sealed from the remainder of the cylinder by a piston 64. A compression spring 66 tends to move the pis-

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ton to resist the pressure action of any fluid entering through the passage 60. Another fluid passage 68 connects the passage 60 with an outlet 70 in the discharge tube 27 of the nozzle. This passage 68 is larger internally than the passage 60. A spring 72 normally seats a valve 74 to effectively close the opening 70. However, a lever 76 is connected to the valve 74 and sufficient pressure on this lever will overcome the spring 72 and open the passage 68. An actuating lever 78 is connected to the piston 64, extends without the cylinder 62 and is so formed as to contact the actuating member 34 at approximately a right angle to any axial stress exerted on the stem 52.

When the nozzle is removed from its rack, starting a pump which supplies fluid to the inlet chamber 6, pressure is exerted through the passage 60 causing movement of the piston 64 to the right against action of the spring 66 as shown in Figure 5. This motion is transmitted through the lever 78 and the actuating member 34 to move the rollers 40 against the action of spring 32 into the elongated portion of the cam head 48. Consequently, any downward force exerted on the stem 52 will merely serve to lower the cam head 48 into the position shown in Figure 5, providing, of course, this force is sufficient to overcome action of spring 58. It will then be understood that the pivot point 54 will merely move downwardly resultant from manual actuation of the control lever 56, and the valve 10 will remain seated. Upon insertion of the discharge tube 27 into the bung hole of a container or the fill pipe of a gasoline tank, the lever 76 will contact the side of the hole or pipe, thereby opening the valve 74, consequently relieving the fluid pressure on the piston 64 since the passage 68 is of greater diameter than the fluid passage 60. The action of spring 58 will then raise the cam head 48 into the position shown in Figure 3: the action of spring 32 will move the rollers 40 into the position shown in that figure since the pressure from the actuating lever 78 has been removed. The rollers 40 now contact the stationary ears 44 and the small portion of the slot of the cam head 48, thereby holding the head 48 and, consequently, the stem 52 stationary. Manual engagement of the control lever 56 may then be utilized to operate valve 10 to any degree desired.

When the container is filled to a point where the liquid covers the restricted opening 26 of the fluid passage 24 the suction action of the venturi 19 will cause movement of the diaphragm 30 to the right against action of spring 32, thus moving the rollers 34 into the elongated portion of cam head 48, thereby releasing the previously stationary pivot 54. The valve 10 will consequently seat itself through action of the spring 16 and flow will be shut off.

To overcome any possible leakage around the piston 64 in the cylinder 62, a small passage 80 connects that portion of the cylinder 62 to the downstream side of the valve 10 in the main flow chamber of the nozzle.

The mechanical modification of the above-described hydraulically actuated nozzle is shown in Figure 2. In lieu of fluid pressure a spring 82 holds an actuating lever 84 in disengaging contact with the actuating member 34. When the discharge tube 27 is inserted into the bung hole, mechanical engagement with concentric lever 86 disposed in an intermediate position on the discharge tube 27 serves to overcome action of the spring 82 to permit operation of the main valve,

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We are aware that many changes may be made and numerous details of construction varied throughout a wide range without departing from the principles of this invention, and we therefore do not purpose limiting the patent granted herein, otherwise than as necessitated by the prior art.

We claim:

1. In a filling nozzle, a valve body having a fluid passage, a self-closing valve in said passage, manual means for opening said valve, means for rendering said manual means ineffective comprising a movable fulcrum support for said manual means, and means to prevent the holding of the said fulcrum support stationary, said means including a lever on the nozzle responsive to insertion of the nozzle into the container to be filled.

2. In a filling nozzle, a valve body having a fluid passage, a self-closing valve in said passage, manual means for opening said valve, means for rendering said manual means ineffective comprising a movable fulcrum support for said manual means, and means to prevent the holding of said fulcrum support stationary, said means including a lever adapted for mechanical actuation resultant from contact with the container and a valve operated by the lever.

3. In a filling nozzle, a valve body having a fluid passage, a self-closing valve in said passage, manual means for opening said valve, means for rendering said manual means ineffective comprising a movable fulcrum support for said manual means, means to prevent the holding of said fulcrum support stationary, said means comprising a lever on the discharge tube of the nozzle and an actuator connected to said lever and adapted to contact said fulcrum support.

4. In a filling nozzle, a valve body having a fluid passage, a self-closing valve in said passage, manual means for opening said valve, a movable fulcrum support for said manual means, means for holding said fulcrum support in movable position to render said manual means ineffective, means operable to overcome said holding means, and further means to control said last named means.

5. In a filling nozzle, a valve body having a fluid passage, a self-closing valve in said passage, manual means for opening said valve, a fulcrum support for said manual means, a spring urging said fulcrum support into supporting position, means for holding said fulcrum support in a non-supporting position, and means operable to overcome said holding means whereby said spring may move the support into supporting position.

6. In a filling nozzle, a valve body having a fluid passage, a self-closing valve in said passage, manual means for opening said valve, a fulcrum support for said manual means, a spring urging said fulcrum support into supporting position, means including a second spring for holding said fulcrum support in a non-supporting position, and means operable to overcome said holding means whereby said first spring may move the support into supporting position.

7. In a filling nozzle, a valve body having a fluid passage, a self-closing valve in said passage, manual means for opening said valve, a fulcrum support for said manual means, a spring urging said fulcrum support into supporting position, means including a second spring for holding said fulcrum support in non-supporting position, and a lever operable to overcome said

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second spring whereby said first spring may move the support into supporting position.

8. In a filling nozzle, a valve body having a fluid passage, a self-closing valve in said passage, manual means for opening said valve, a fulcrum support for said manual means, a spring urging said fulcrum support into supporting position, a piston under fluid pressure connected to said fulcrum support to hold same in non-supporting position, and mean operable to relieve said fluid pressure whereby said spring may move the support into supporting position.

9. In a filling nozzle, a valve body having a fluid passage, a self-closing valve in said passage, manual means for opening said valve, a fulcrum support for said manual means, a spring urging said fulcrum support into supporting position, a closed cylinder on the nozzle a piston disposed therein, an actuating member connected to said piston and contacting the fulcrum support, means constantly urging said actuating member away from contact with the fulcrum support, a source of fluid pressure connected to the cylinder to urge said piston in a direction to force contact between said actuating member and the support, and means for relieving said fluid pressure.

10. In a filling nozzle, a valve body having a fluid passage, a self-closing valve in said passage, manual means for opening said valve, a fulcrum support for said manual means, a spring urging said fulcrum support into supporting position, a closed cylinder on the nozzle a piston disposed therein, an actuating member connected to such piston and contacting the fulcrum support, means constantly urging said actuating member away from the support, a source of fluid pressure connected to the cylinder to urge said piston in a direction to force contact between said actuating member and the support, and means for relieving said fluid pressure, said means comprising a conduit which selectively may connect the cylinder to the atmosphere.

11. In a filling nozzle, a valve body having a fluid passage, a self-closing valve in said passage, manual means for opening said valve, a fulcrum support for said manual means, a spring urging said fulcrum support into supporting position, a closed cylinder on the nozzle a piston disposed therein, an actuating member connected to said piston and contacting the fulcrum support, means constantly urging said actuating member away from the support, a source of fluid pres-

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sure, a conduit connecting said cylinder to said fluid pressure source to urge said piston to force contact between said actuating member and the fulcrum support, a second conduit hydraulically connecting the cylinder to the atmosphere, a normally closed valve in said second conduit, and means operable to open said valve.

12. In a filling nozzle, a valve body having a fluid passage, a self-closing valve in said passage, manual means for opening said valve, a fulcrum support for said manual means, a spring urging said fulcrum support into supporting position, a closed cylinder on the nozzle a piston disposed therein, an actuating member connected with said piston and contacting the fulcrum support, means constantly urging said actuating member away from the support, a source of fluid pressure, a conduit hydraulically connecting said cylinder to said fluid source to urge said piston to force contact between said actuating member and the support, a second conduit connecting the cylinder to the atmosphere, said second conduit being of larger internal diameter than the first conduit, a normally closed valve in the second conduit, and means operable to open said valve.

13. In a filling nozzle, a valve body having a fluid passage, a self-closing valve in said passage, manual means for opening said valve, a fulcrum support for said manual means, a spring urging said fulcrum support into supporting position, a closed cylinder on the nozzle a piston disposed therein, an actuating member connected to said piston and contacting said fulcrum support, means constantly urging said actuating member away from the support, a source of fluid pressure connected to the cylinder on one side of the piston to urge said piston in a direction to force contact between said actuating member and the support, means for relieving said fluid pressure on said one side of the piston, and a passage connecting the cylinder on the other side of the piston to the atmosphere.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,320,033	Davis, Jr.	May 25, 1943
2,343,903	Hammand	Mar. 14, 1944