June 14, 1966 R. D. McDONALD 3,255,789

SHUT-OFF ADAPTER FOR AUTOMATIC GASOLINE NOZZLES

Filed Nov. 21, 1963

Fig. 1

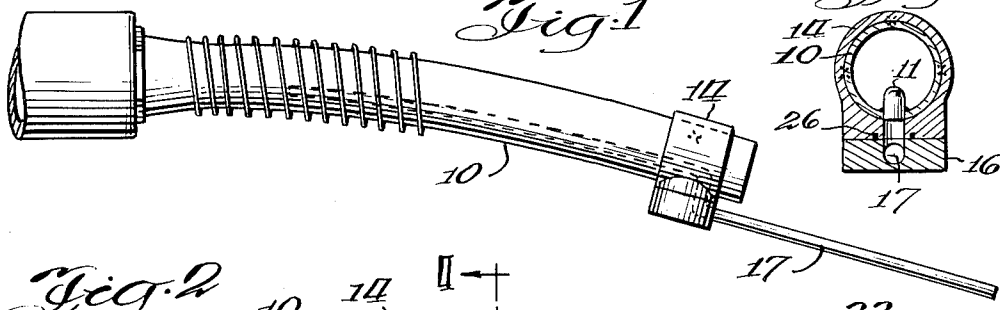


Fig. 4

Fig. 2

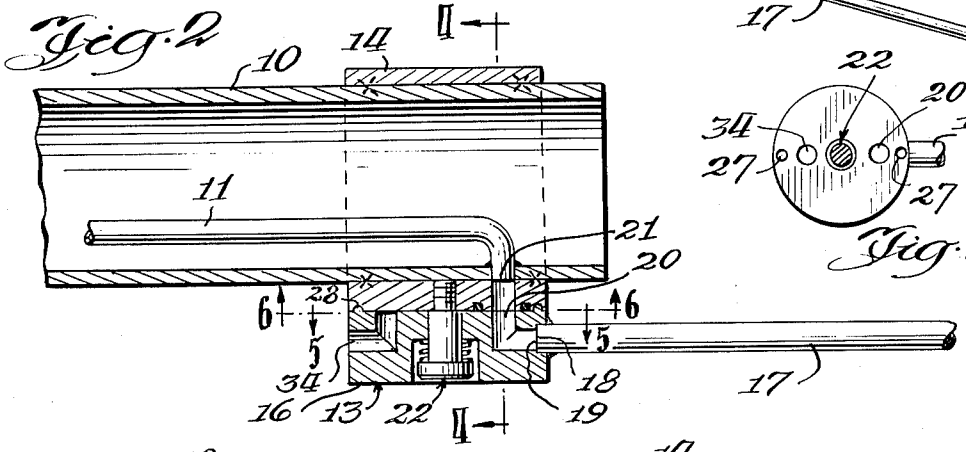


Fig. 5

Fig. 3

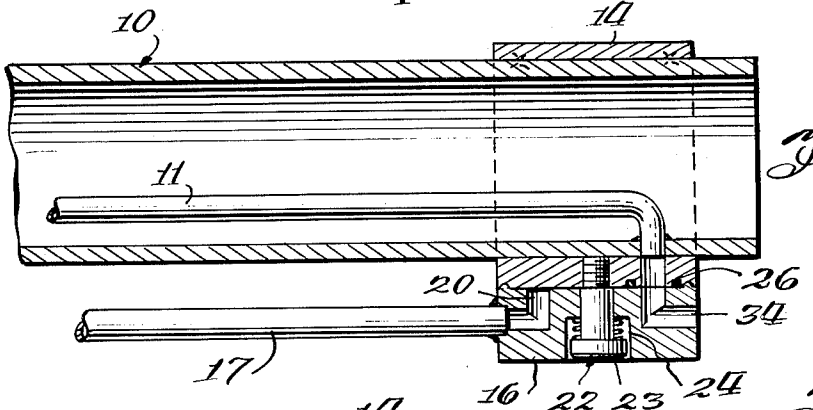
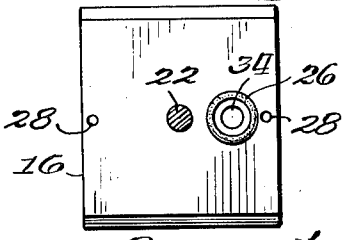


Fig. 6



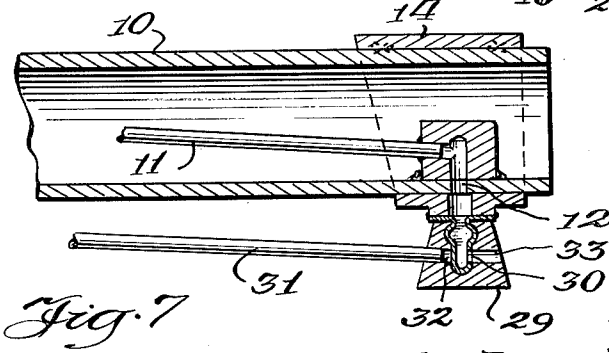


Fig. 7

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SHUT-OFF ADAPTER FOR AUTOMATIC GASOLINE NOZZLES

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This invention relates generally to an adapter for an automatic filling nozzle for filling random containers with liquid. More particularly, this invention is concerned with a shutoff adapter for use with an automatic liquid filling nozzle.

This invention is usable in connection with a number of liquids so that it is not intended to limit this disclosure to any particular use although it will be described in connection with nozzles designed for filling fuel tanks of motor vehicles.

Conventional automatic nozzles used for dispensing gasoline utilize the principle of differential air pressure on a diaphragm to function. In this respect, actuation of a valve to a locked operative position permits automatic emission of fluid through the nozzle into the tank to be filled. The nozzle spout is generally designed to be inserted for a short distance into the fill pipe leading to the gas tank. Upon the gasoline reaching the level of the inserted nozzle spout, it blocks an opening in a small tube, which is positioned within the spout and leads back to a diaphragm in the nozzle. As a result, a pressure differential on one side of a diaphragm located within the nozzle occurs. This causes movement of the diaphragm, which, in turn, causes operation of the actuating valve to an inoperative position, thereby shutting off the flow of the gasoline.

With the use of the automatic nozzles presently available, a number of problems are present. On many occasions, when the tank is filled, there is a rushing or escaping of air out of the tube leading to the gas tank, producing so-called "blow back." This has the adverse features of forcing gasoline out of the tank. As one can readily visualize, this spilling action causes the gasoline to soil or damage the finish on the automobile and, additionally, creates a fire hazard due to the highly inflammable fluid spilled over the pavement, disregarding the gasoline loss. Though this problem could be rectified by lengthening the spout on the gasoline nozzle, the modification of equipment presently available on the market could not be accomplished without considerable expense because not only would the nozzle spout itself have to be lengthened, but, additionally, the nozzle storage compartment on the pump would also require extensive redesign. In order to obviate the costly spillage problem inherent with present automatic nozzles at a minimal cost, applicant provides an adapter for use with the automatic nozzle presently in use. With the adapter in an operative or fill position, the tube located within the spout is extended beyond the end of the nozzle spout such that the gasoline, upon reaching the level of the adapter, causes the automatic operation of the nozzle valve. The automatic fluid flow is then stopped before any spillage occurs. The adapter, subsequent to use, is intended to be swiveled to an inoperative position in order that the nozzle can be inserted into its compartment on the pump itself without any modification of the pump nozzle storage compartment. When the adapter is in the inoperative position the automatic nozzle also works at its normal shutoff point. Therefore, in the inoperative position the nozzle functions as it would without the adapter.

Other features and advantages are inherent in the structure claimed and disclosed, as will be apparent to those skilled in the art from the following detailed description in conjunction with the accompanying drawings:

FIG. 1 shows the adapter in an operative position;

FIG. 2 shows a sectional view of the adapter in an operative position;

FIG. 3 shows a sectional view of the adapter in an inoperative position;

FIG. 4 shows a sectional view taken along line 4—4 in FIG. 2;

FIG. 5 shows a sectional view taken along line 5—5 in FIG. 2;

FIG. 6 shows a sectional view taken along line 6—6 in FIG. 2; and,

FIG. 7 shows another embodiment of the adapter.

In FIGURE 1, spout **10** is shown extending from the nozzle proper. Located within spout **10** is tube **11**, one end of which terminates in an outlet **12** on the spout while the other end leads to a compartment, a portion of which is enclosed by a diaphragm (not shown). Attached to spout **10** is an adapter **13**. The adapter has a band **14** fastened by suitable means to the outer face of spout **10** and swivelably connected to band **14** is adapter member **16**.

Tube **17** extends from and is rigid with member **16** with end **18** aligned with outlet **19** of a hollow passage **20** located within member **16**. The inlet **21** of passage **20** is so located that in an operative position, passage **20** is in alignment with tube outlet **12**. Member **16** has another hollow passage **34**. When the adapter is in an inoperative position, passage **34** and outlet **12** are aligned to allow the nozzle to operate at its normal shutoff position.

The adapter is capable of being turned or swiveled 360°, though from an operative to an inoperative position the necessary swivel is only 180°. Swiveling is accomplished by attaching member **16** to band **14** by a spring biased pin means such as shown at **22**. Screw **23** or other suitable fastening means, e.g., pin, can be used to fasten member **16** to band **14**. The screw is biased by any suitable means, such as spring **24**, to assure that adapter **13** is maintained in an airtight, leak-proof connection with spout **10** and tube outlet **12**. To further assure that no leakage will occur between adapter **13** and **14**, an O-seal **26** is provided as illustrated in FIGURES 2 and 3.

Detents **27** located on member **16** mate with recesses **28** in band **14** so that when member **16** is swiveled 180°, the adapter will be in a locked position. Naturally it would be possible to provide the recesses on member **16** and detents on band **14** or to provide some other form of suitable locking means.

In FIGURE 7 another embodiment of the invention is shown. Band **14** has attached thereto a hollow swivel head **28** and revolvably mounted on head **28** is adapter member **29**. If desired, head **28** could be made an integral part of band **14**. Head **28**, which has an aperture **36** located therein, is in alignment with tube outlet **12**. Member **29** is attached to head **28** by means of a press fit so that there is a continuous airtight leak-proof connection between head **28** and adapter member **29**. If desired, an additional sealing means could be provided as described above. Tube **31** is attached in an aligned position to a first hollow passage **32** in member **29**. In the adapter operative position tube **31** and passage **32** are in alignment with aperture **36**. Additionally, a second hollow passage is located within member **29** so that when the adapter is in its inoperative position passage **33** and aperture **36** are aligned and the nozzle will be able to automatically close at its normal shutoff position.

When the attendant is called upon to fill the tank, the nozzle may be removed from its storage compartment on the pump and the adapter swiveled to an operative position such as shown in FIGURE 1. Adapter tube **17**, swiveled to its operative position, and spout **10** are inserted into the tube leading to the gas tank of the vehicle and the

nozzle valve is actuated to automatically permit the flow of gasoline into the gas tank. When the level of the fluid contacts the end of adapter tube **17**, furthest from adapter **13**, air pressure within the valve compartment is changed causing movement in the diaphragm which, in turn, effects the cut-off of the flow of gasoline into the tank thus preventing any "blow back."

The adapter can be made of any material, e.g., plastic, which is impervious to the fluid being transported.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, as modifications will be obvious to those skilled in the art.

What is claimed is:

1. An adapter for use with a liquid filling nozzle having a spout for emitting fluid in which a first tube is located and which terminates in an outlet on the wall of said spout, said adapter comprising:

a connecting means for connecting said adapter to said spout;

an adapter member secured to said connecting means and supported to turn thereabout;

a second tube rigid with said adapter member, said second tube extending in length beyond said spout when said adapter is in an operative position.

2. An adapter in accordance with claim **1** wherein said adapter member has a first hollow passage located therein with one end of said first passage in alignment with an end of said second tube and said remaining passage end in alignment with said first tube when said adapter is in an operative position.

3. An adapter in accordance with claim **2** wherein said adapter member includes a second hollow passage located therein with one end of said second passage in alignment with said first tube when said adapter is in an inoperative position.

4. An adapter in accordance with claim **2** further including a biasing means for basing said adapter member against said spout to afford an airtight and leak-proof connection between said spout and member.

5. An adapter member in accordance with claim **1** made of plastic.

6. An adapter in accordance with claim **1** wherein said connecting means is a band member.

7. An adapter for use with an automatic liquid filling nozzle having a spout for emitting fluid in which a first tube is located and which terminates in an outlet on the wall of said spout, said adapter comprising:

a connecting means for connecting said adapter to said spout;

a swivel head rigid with said connecting means, said swivel head having an aperture therein;

an adapter member secured to said swivel head and supported to turn thereabout;

a second tube rigid with said adapter member, said second tube extending in length beyond said spout when said adapter is in an operative position.

8. An adapter in accordance with claim **7** wherein said adapter member has a first hollow passage located therein with one end of said first passage in alignment with an end of said second tube and said remaining passage end in alignment with said first tube when said adapter is in an operative position.

9. An adapter in accordance with claim **7** wherein said adapter member includes a second hollow passage located therein with one end of said second passage in alignment with said first tube when said adapter is in an inoperative position.

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