Dec. 24, 1935. T. S. MILLER 2,025,067

TANK FILLING DEVICE

Filed Dec. 17, 1934

Fig. 1.

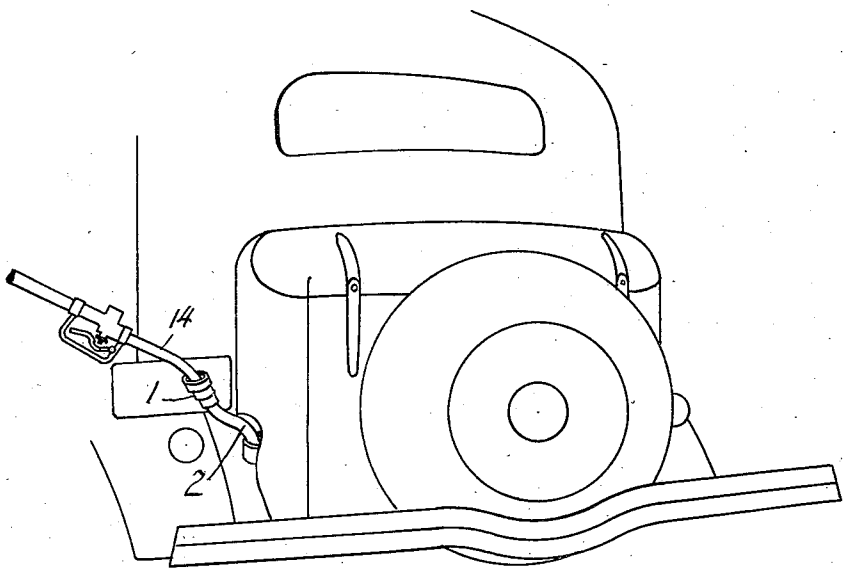


Fig. 2.

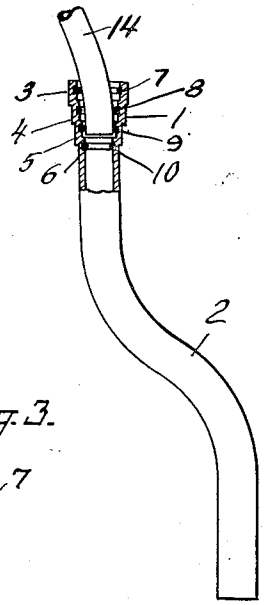


Fig. 4.

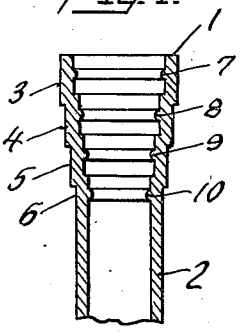


Fig. 5.

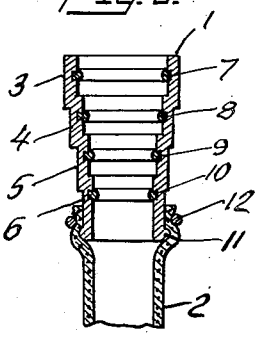
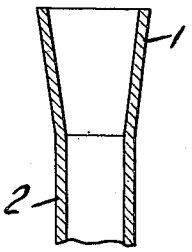


Fig. 3.



Fig. 6.



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TANK FILLING DEVICE

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Application December 17, 1934, Serial No. 757,851

2 Claims. (Cl. 285—198)

This invention relates to tank filling devices and particularly to attachments for fluid delivery nozzles. More particularly, the invention contemplates the provision of an improved attachment for fluid delivery nozzles to facilitate the filling of gasoline tanks in automobiles.

As a result of recent efforts to "stream line" bodies of automobiles, gasoline tank openings in modern cars are frequently placed behind or beneath some of the rear appurtenances of the automobile. The location of tire racks and luggage carriers at the rear of modern automobiles is frequently such as to interfere with the accessibility of the opening in the gasoline tank. This modern type of construction, while desirable from many view points, has resulted in difficulties, both for the gasoline filling station and for the consumer. The insertion of a gasoline delivery nozzle into the gasoline tank is often difficult and time consuming. The final position of the nozzle in the neck of the tank is often so precarious that the gasoline must be pumped slowly to avoid spilling. Thus useless delay is occasioned, both for the consumer and for the filling station operator. From the standpoint of the vendor of gasoline there is an even more serious objection. The volume indicators on modern gasoline pumps are usually graduated for definite rates of flow of the fluid. If the pumping rate is reduced either by diminishing the speed of the pumping means or by constricting the flow by means of an outlet valve the pump will deliver more fluid than is indicated. In some instances a pump may deliver at least 10% more than the amount which is indicated. Inasmuch as the profit of filling stations upon gasoline is usually less than 10%, this discrepancy in measurement may be extremely serious. In some instances the discrepancy may eliminate all profit upon a sale and cause an actual loss to the vendor.

The heretofore customary means of filling gasoline tanks having inconveniently placed openings has been to hold the metal delivery nozzle over the opening and close the valve on the delivery line to a point that will permit delivery of the gasoline without spilling. This method, of course, occasions waste of time and induces the aforementioned measuring difficulties. In contradistinction to the heretofore customary method of filling gasoline tanks, the present invention contemplates, in its complete aspect, an apparatus whereby any such tank may be filled at the normal rate of speed, even though the opening in the tank be relatively inaccessible.

The apparatus in its preferred construction comprises a delivery tube provided with an adaptor designed to fit various sizes of gasoline delivery nozzles. The delivery tube is designed to reach otherwise inaccessible gasoline tank openings. When an automobile with an inconveniently located tank opening is to be filled, the ordinary gasoline delivery nozzle on a pump is inserted into the adaptor, and the delivery tube (which may be either flexible, or rigid and bent to an appropriate curvature) is inserted into the gasoline opening in the tank. The adaptor is so constructed as to fit tightly over the delivery nozzle, and the delivery tube connected to the adaptor and communicating therewith may be firmly and securely placed within the opening. Gasoline delivery may then be effected at the normal rate of speed, and the difficulties encountered in the heretofore customary practice are avoided.

The invention will be better understood in the light of the following detailed description taken in conjunction with the drawing, in which:

Fig. 1 shows a presently preferred form of the apparatus in use;

Fig. 2 is a sectional view of a presently preferred form of the apparatus, in which the adaptor and delivery tube may be made of metal, the adaptor being provided with gaskets;

Fig. 3 is an enlarged sectional view showing the manner in which a flexible gasket may be fastened into a metal adaptor;

Fig. 4 is a sectional view of an adaptor and tube constructed of flexible material;

Fig. 5 is a sectional view of a modified form of construction with a metal adaptor provided with flexible gaskets and connected to a flexible tube; and

Fig. 6 is a sectional view of a further modification of my invention wherein the adaptor is a flexible frusto-conical member.

Referring to the drawing, it will be seen that the apparatus of my invention comprises an adaptor 1, rigidly connected to a delivery tube 2. The adaptor comprises a series of intercommunicating, concentric, cylindrical portions 3, 4, 5 and 6 of progressively smaller diameters, the portion having the smallest diameter being nearest the point at which the adaptor connects with the tube. Each of the intercommunicating, concentric, cylindrical portions of the apparatus is provided with an annular flexible gasket 7, 8, 9 and 10. These gaskets are located within the cylindrical portions in axial alignment therewith and have an internal diameter less than the internal diameter of the respective cylindrical portion.

The diameter of the delivery tube 2 is preferably no smaller than that of the smallest cylindrical portion of the adaptor in order that no undue constriction to the flow of gasoline may result.

As shown in Figs. 2 and 4, the adaptor and the delivery tube may be constructed integrally of either a rigid material such as metal, or of a flexible material such as rubber. In the event that the tube is made of metal, it should be appropriately curved in order to reach relatively inaccessible openings. If the delivery tube is constructed of rubber or other flexible material, it may be made straight because the material will readily adapt itself to the required curvature.

As shown in Figs. 2, 3 and 5, when the adaptor is constructed of some rigid material, such as iron or brass, provision is made for fastening the flexible flaskets within the intercommunicating, concentric, cylindrical portions of the adaptor. A convenient means of fastening the gaskets into the cylindrical portions is shown in Fig. 3. An annular groove 13 of trapezoidal cross-section is provided in the wall of the adaptor, the base of the trapezoid forming the innermost surface of the groove. A flexible gasket having a mushroom cross-section is fitted into the groove and is held in place by the walls of the groove. When the adaptor is constructed of flexible material, the gasket may be constructed integrally therewith.

Fig. 5 illustrates another embodiment of my invention, wherein the adaptor is constructed of metal and inserted in a flexible delivery tube. As shown in Fig. 5 the inserted end of the adaptor is provided with an exterior annular boss 11. Fastening means 12, such as a wire ring, is placed tightly around the flexible tube and serves to provide a tight connection.

The apparatus illustrated in Fig. 6 comprises a flexible adaptor 1 of frusto-conical shape fastened to a delivery tube 2 which may be either rigid and curved, flexible and straight, or flexible and curved. The proportions of the adaptor are such as to permit a tight fit when the gasoline delivery nozzle is inserted therein. Preferably, the taper on the adaptor is relatively slight, so as to give a large contact surface between the gasoline delivery nozzle and the adaptor, when the former is pressed into the latter.

It will be understood that the apparatus may also be constructed with a flexible adaptor firmly attached to an appropriately curved rigid tube.

In operation, a gasoline delivery nozzle 14 connected to the pump is inserted into the adaptor of the attachment until it fits tightly within one of the several gaskets. The outer end of the delivery tube of the attachment is then inserted into the opening in the gasoline tank, and gasoline is passed through the inter-connecting passageways of the assembly into the tank at a normal rate.

Gasoline delivery nozzles are made in several diameters, so that even within a single filling station the various pumps may be equipped with various sized nozzles. The apparatus of my invention may be adapted to fit the various sizes of gasoline delivery nozzles now in use so that a single attachment may be used for several pumps—even though they have delivery nozzles of different sizes. In practice the apparatus of my invention may be placed in an accessible place in the filling station and may be attached to a delivery nozzle when it is needed.

It will be apparent that my invention provides simple, cheap and ready means for eliminating delay, spills and inaccurate measurement in the vending of gasoline. The apparatus is of simple construction and may be built very cheaply.

Modifications of the apparatus of my invention may occur to the man skilled in the art without, however, departing from the principle of my invention.

I claim:

1. An attachment for fluid delivery nozzles which comprises a flexible adaptor having a stepped interior adjacent its inlet end, with the stepped portions progressively increasing in diameter towards said inlet end, the stepped portions terminating in abutment shoulders and being provided with integrally formed gasket means intermediate their ends, and a flexible tube connected to said adaptor adjacent the smaller end thereof.

2. An attachment for fluid delivery nozzles which comprises an adaptor formed of flexible and resilient material and having a stepped interior adjacent the inlet end, with the stepped portions progressively increasing in diameter towards said inlet end, the stepped portions terminating in abutment shoulders, said stepped portions being provided with gasket means intermediate their ends, each of said gasket means comprising a continuous rib formed on the interior wall of the stepped portion, which rib causes an increase in the thickness of the walls of the stepped portions at the places where the ribs are formed, whereby the effectiveness of the seal formed by the gasket is increased.

THOMAS S. MILLER.