

Sept. 30, 1941.

F. P. SCULLY ET AL

2,257,656

AUDIBLE SIGNALING DEVICE FOR USE WITH TANKS

Filed Nov. 25, 1939

Fig. 1

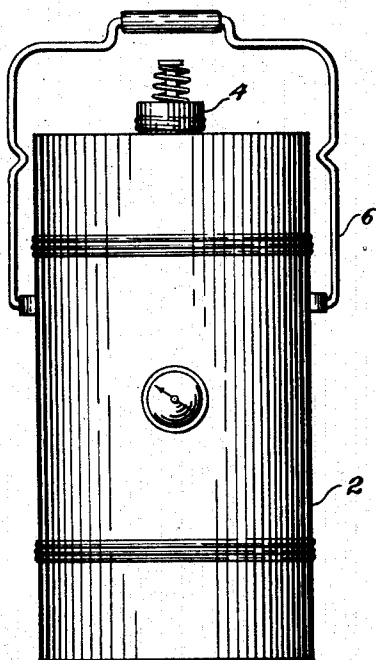


Fig. 2

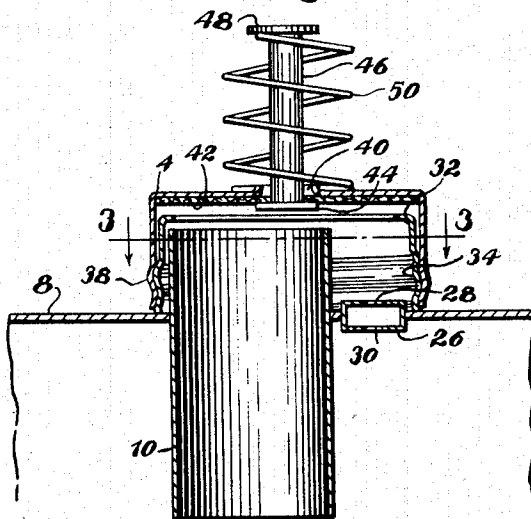


Fig. 3

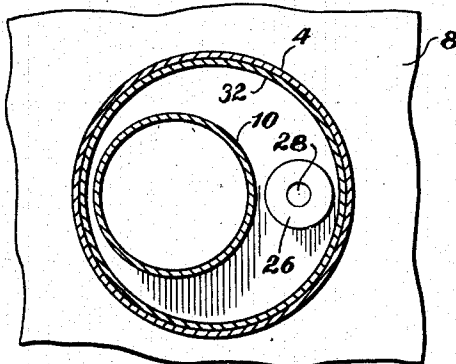


Fig. 4

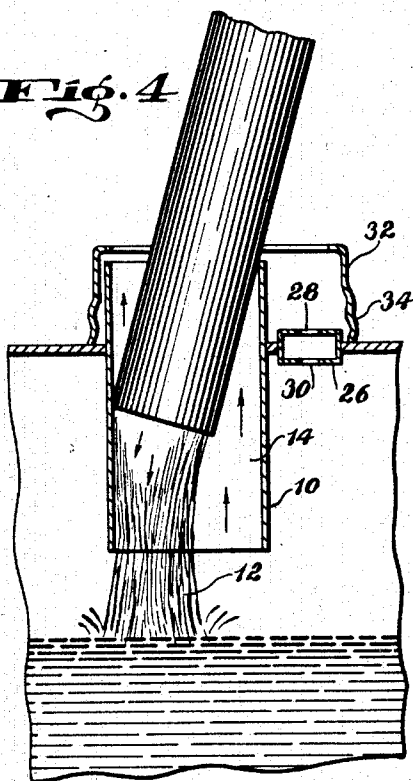


Fig. 5

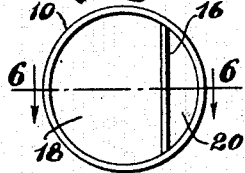


Fig. 7

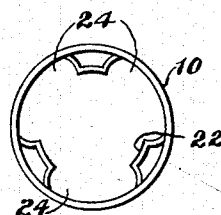


Fig. 6

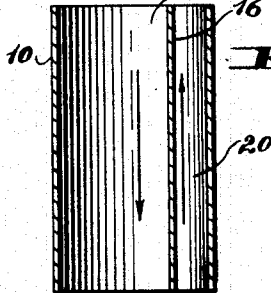
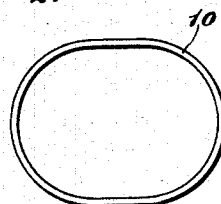


Fig. 8



INVENTORS
Frank P. Scully
A. Edward Mathey
BY C. A. Chittick
ATTORNEY

UNITED STATES PATENT OFFICE

2,257,656

AUDIBLE SIGNALING DEVICE FOR USE
WITH TANKS

Frank P. Scully, Cambridge, and Alcide Edward
Mathey, Auburndale, Mass., assignors to Scully
Signal Co., East Cambridge, Mass., a corpora-
tion of Massachusetts

Application November 25, 1939, Serial No. 306,143

5 Claims. (Cl. 116-109)

This invention relates to signaling means for indicating the level of liquid in a tank during filling thereof.

While signaling means of various types have been used in connection with the filling of tanks, in the main such signaling means have been used with relatively large tanks, as, for example, automobile gasoline tanks, fuel oil tanks, tank cars and other containers of the same general description.

In the filling of small tanks, however, as, for example, one, two and five gallon cans, one and two gallon tanks of the type used with various sorts of oil stoves, signaling means have been noticeably absent. Gauges have been supplied on small tanks, but these have been relatively expensive and very apt to get out of order.

One of the objects of our invention is, therefore, to provide an audible signaling mechanism for use with small tanks, principally, although, of course, it will be understood that this construction may be used with any size tank, which will be cheap and positive in operation to give indication to the person filling the tank when the liquid level has reached a predetermined point.

Another object of our invention is to provide signaling means which may be combined with the typical carburetion filler cap that is now in common use.

These and other objects of our invention will become more apparent as the description proceeds with the aid of the accompanying drawing in which:

Fig. 1 is an elevation of a typical container with which the signaling means may be used.

Fig. 2 is a fragmentary sectional elevation showing in detail the construction of the invention.

Fig. 3 is a section on the line 3-3 of Fig. 2.

Fig. 4 is a detail showing the nature of the filling operation.

Fig. 5 is a plan view of one form of fill pipe construction.

Fig. 6 is a sectional elevation on the line 6-6 of Fig. 5.

Fig. 7 is a plan view of another modification of fill pipe construction.

Fig. 8 is still another form of fill pipe.

Referring to the drawing, in Fig. 1 is shown a typical container 2 having a fill connection at the top closed by filler cap 4. Included with this filler cap is a carburetion mechanism which will be referred to hereinafter. Container 2 is shown with a carrying handle 6, but this is a detail which constitutes no part of the invention.

In Fig. 2 the top of the container is denoted as 8, and extending therethrough is a fill pipe 10. This pipe extends downwardly into the container to the point at which it is desired to indicate the liquid level to the operator. Fill pipe 10 may, if desired, extend upwardly above the tank top 8, as shown in Fig. 2, but this is not essential for operativeness of the signaling mechanism.

Fill pipe 10 may take several forms, provided it meets the requirement that it is of adequate size to permit entrance of liquid therethrough, and at the same time allow gases to vent freely past the entering liquid. This may be accomplished in a number of ways, one of which is to have the fill pipe considerably larger in section than the cross-sectional area of the entering liquid. Such construction is shown in Fig. 4, where it is apparent that the size of the entering stream of liquid 12 is such that an adequate area at 14 remains through which gas may escape.

Another type of fill pipe construction is shown in Fig. 5. Here the pipe is divided into two parts by a wall 16 extending throughout the length of the pipe. This provides a passage 18 through which the liquid may enter and a passage 20 through which gas may escape.

Still another form of fill pipe is shown in Fig. 7. This construction is designed to prevent the insertion into the fill pipe of a filler nozzle of such size that it could block the fill pipe to such an extent that gases could not escape freely there-through.

To accomplish this result the pipe has a series of spacers 22 which extend inwardly and are spaced about the inner circumference of the fill pipe in sufficient number to maintain a filling nozzle in central location. By this construction the areas at 24 provide ample space through which gas may escape.

Another fill pipe construction is shown in Fig. 8. By making the fill pipe oval in section, or other than round, it is obvious that any filling nozzle positioned within could not entirely close the pipe. This, of course, is based on the assumption that the filler nozzle is round, which is the customary situation at present, or of cross-section differing from that of the fill pipe.

Adjacent the fill pipe is an opening in top 8 in which is positioned a whistle 26. This whistle may be of any suitable construction, provided it becomes audible when gas in suitable volume is forced therethrough. The whistle should be adapted to operate on relatively low pressures, but at the same time should be inaudible when

gas is passing through it at a rate less than a predetermined minimum.

A whistle of the button type, as shown, is suitable for use in this connection. Such a whistle has an upper opening 28 and a lower opening 30.

Fill pipe 10 and whistle 26 are preferably positioned close enough to each other so that they may be conveniently surrounded by an upstanding circular rim 32 which is preferably threaded as at 34 to receive the corresponding filler cap 4 threaded at 38. The purpose of having the fill pipe and whistle relatively close to each other is to facilitate closing both of these entrances to the tank by a single filler cap so that the tank may be more readily sealed.

In the case where the container is a typical five gallon can or of some similar construction the filler cap would be of the ordinary imperforate type adapted to completely seal the container. In other instances, however, where the container is used in connection with an oil stove, for example, the filler cap may incorporate therewith a carburetion mechanism which is shown in detail in Fig. 2. This device is formed by the provision of a hole 40 through the center of the cap, a washer or liner 42 of material suitable to provide an oil-tight seat, a valve 44 on the end of valve stem 46, which terminates in a disk 48, which is adapted to act as an abutment against which a spring 50 may rest. The other end of the spring 50 seats on the upper side of filler cap 4. Since the spring is under compression, it is apparent that valve 44 will be seated tightly against washer 42 to provide a liquid-tight seal.

Valve 44 opens when the container is inverted and placed in position in the fuel supply mechanism of the stove or burner, by virtue of the engagement by the end of valve stem 46 with a suitable part of the supporting structure. Valve 44 is located so as to be unobstructed by pipe 10 throughout the range of necessary opening movement.

The operation of the signaling mechanism and carburetion device is as follows. Filler cap 4 is removed, exposing fill pipe 10 and whistle 26 located within rim 32. Liquid is fed into the tank through fill pipe 10 either as a directed stream or by the insertion of a filling nozzle as shown in Fig. 4. In either event the entering stream will only partially fill the pipe 10 so that the gas that is displaced may have easy escape to the atmosphere.

Naturally there will be a slight pressure within the tank as the liquid enters; but due to the fact that the unobstructed area of fill pipe 10 is very much greater than the area of ports 28 and 30 through whistle 26, the large majority of the gas will pass out through fill pipe 10 and the small volume of gas that passes through whistle 26 to the atmosphere will be insufficient to cause audibility.

As filling continues, the liquid level will ultimately reach the lower end of fill pipe 10; and obviously when this takes place, gas can no longer escape through the fill pipe, as the lower end will be trapped.

Thereafter all of the gas must escape through whistle 26; and this means that gas flowing at a much higher rate must instantly commence to pass through whistle 26 following the trapping of the lower end of the fill pipe. The result is that whistling commences so that the operator is immediately advised that the liquid level has reached the lower end of the fill pipe. The liq-

uid supply may then be shut off before overflow has taken place.

With the filling operation completed, filler cap 4 is then screwed in place, thus effectively sealing the container. If the filler cap has a carburetion device of the type heretofore described, the container is then ready to be inverted for use in the usual manner with an oil stove or for whatever service it is intended to be put.

While preferred forms of the invention have but disclosed in the drawing and described herein, it is to be distinctly understood, however, that the invention is not to be limited thereby, but only by the appended claims.

We claim:

1. In combination, a container for liquid, a tube acting as a combined fill pipe and vent projecting downwardly into said container to a position where it may be sealed by rising liquid, a separate passage through said container having an audible signaling device in series therewith, the cross-sectional area of said tube being great enough to permit venting of gas therethrough from said container during filling and while the liquid level is below the end of the tube to prevent development of sufficient pressure in said container to operate said signaling device, said tube being long enough to permit sufficient rise of liquid therein after the lower end has been sealed to create adequate pressure in said tank to operate said signaling device.

2. The combination set forth in claim 1, in which there is common means removably affixed to said container for encasing the outer ends of said tube and signaling device to seal said container.

3. The combination set forth in claim 1, in which a housing surrounds the exit ends of said tube and signaling device and a cap is affixed to said housing to cover the outer ends of said tube and signaling device.

4. The combination set forth in claim 1, in which said tube extends above the top of said container whereby liquid may rise in said tube above the top of said container to permit substantially complete filling of said container without overflow of said tube.

5. In combination, a container for liquid, a tube acting as a combined fill pipe and vent projecting downwardly into said container to a position where it may be sealed by rising liquid, a separate passage through said container having an audible signaling device in series therewith, the cross-sectional area of said tube being great enough to permit venting of gas therethrough from said container during filling and while the liquid level is below the end of the tube to prevent development of sufficient pressure in said container to operate said signaling device, said tube being long enough to permit sufficient rise of liquid therein after the lower end has been sealed to create adequate pressure in said tank to operate said signaling device, said tube also extending above the top of said container whereby liquid may rise in said tube above the top of said container to permit substantially complete filling of said container without overflow of said tube, a housing surrounding the exit ends of said tube and said signaling device, and a cap affixed to said housing to cover the outer ends of said tube and said signaling device.

FRANK P. SCULLY.
A. EDWARD MATHEY.