

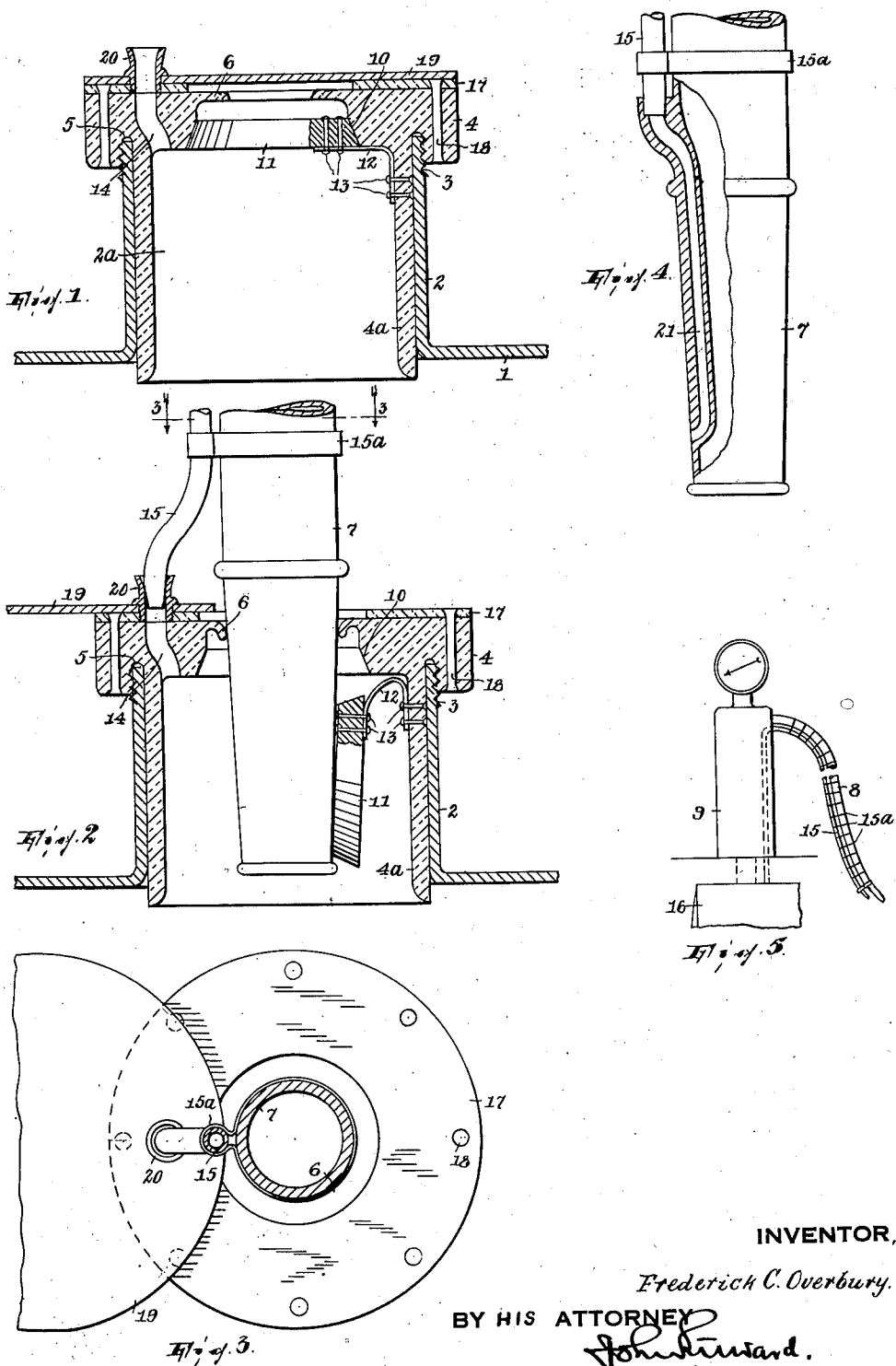
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ADAPTER FOR EXPLOSIVE FLUID TANKS

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ADAPTER FOR EXPLOSIVE FLUID TANKS

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5 Claims. (Cl. 220—86)

It is known that serious danger attends the filling of tanks with volatile inflammable liquids, such as gasoline, due either to presence of a flame in the vicinity of the tank, as on striking a match, or to a spark caused by static electricity and which jumps the space between the tank and filling nozzle when the latter is applied to the filling inlet of the tank. Of course, this danger has been manifested usually in connection with the filling of the gasoline tanks of automobiles where carelessness and disregard of the high inflammability of this fuel frequently attend a filling operation and where also static electricity generated by the automobile as an incident of its operation has to be taken into account.

One object of this invention is to provide an inflammable-fluid tank or other receiver with means at an opening therein, as its filling inlet, for sealing the contents of the tank from the atmosphere at least while actual passage of the fluid is going on, whereby any vapor arising will be confined in the receiver and sparks or other igniting sources excluded therefrom and an explosion or conflagration will be prevented. In the best form, as will hereinafter appear, the construction of said means is such that it normally acts to seal not only during actual passage of the fluid but between such periods. Further, in order that the operation may not be checked by change of atmospheric pressure in the receiver during fluid transfer I provide a conductor for air connecting the receiver and reservoir with which it is connected by the conductor for the fluid being transferred.

Another object is to provide such a receiver with means at its said opening for electrically insulating the portion of the receiver having the opening from the fluid conductor when the latter is applied to the receiver.

A still further object is to construct said means so that it may form an adapter for attachment to existing receivers.

In the drawing,

Fig. 1 is a vertical sectional view of the inlet portion of an automobile fuel tank equipped with the means of this invention, which is here shown closed;

Fig. 2 is a similar view, showing a filling nozzle in filling position;

Fig. 3 a sectional view on line 3—3, Fig. 2;

Fig. 4 shows a form of nozzle which may be used in place of that shown in the first three figures; and

Fig. 5 diagrammatically illustrates a standard filling apparatus and a part of the equipment for

venting the air from the tank to be filled back to the reservoir of such apparatus.

The receiver or tank 1 to be filled has the usual upstanding inlet or mouth 2 affording the opening, here a passage 2a, of the receiver. In place of the cap usually screwed thereon at 3 my invention contemplates the following:

4 is an annular gasket which may be secured upon the inlet in any way, but since it should be attached thereto in some way so that the joint between them shall be sealed I prefer to form it from some elastic yielding material, as rubber, which will form a good sealing contact with the inlet continuously thereof, as by forming a concentric groove 5 in the under side of said member adapted to receive the rim of the inlet with a snug fit, as shown.

This member has a flange or lip 6 which projects inwardly from and extends continuously of its inner surface, the opening or passage through which should be of somewhat less diameter than that of the nozzle 7 of the fuel conductor 8 leading from a filling apparatus 9 (Fig. 5). As so far described, when the nozzle is inserted it must first expand this flange or lip, wherefore thereupon the contents of the tank (even the vapor of the fuel) are confined therein and admission of any igniting influence is prevented.

For preventing escape of the contents of the tank or admission thereto of igniting influences in the intervals between fillings the member 4 has an inside valve-seat 10, preferably upwardly conical, and with this coacts a valve 11, also preferably upwardly conical, which is depressible but is normally held against its seat, or closed. This valve in the present example is pivotally supported and held normally closed by a strip of spring metal 12 which is bent to the proper angle and is secured to the valve and the inner surface of member 4 by rivets 13.

In reference to the illustrated combination of the lip 6 and valve 11, it is noted that before the valve is opened by the act of entering the nozzle a vapor-tight seal is formed around the nozzle by the lip. In short, at no time is there access to each other as between the interior and exterior of the tank, as there would be between fillings if the valve were absent or during filling if the lip were absent.

Of course during filling provision must be made for displacement from the tank of the contained air. Wherefore the member 4 may be provided with an air-escape duct 14 with which an air vent tube 15 connected to the tank 16 of the filling apparatus 9 and lashed to the conductor or pipe

8 by bands 15a may be placed in communication. Further reference to this will be made hereinafter.

To prevent sparking between the nozzle and some portion of the tank inlet as an incident of static electricity present in either of them the member 4 is formed of insulating material, as rubber already mentioned, and in the best form it has a depending sleeve 4a (of insulating material), here formed integral with it and also yielding; this is of sufficient depth to reach at least as far down as the bottom of the inlet so as to prevent contact of the inserted nozzle with the inlet at any point.

The member 4 may be reinforced by an apertured stiff disk 17 superimposed thereon and in any way secured thereto, as by rivets 18. And to exclude water there may be a closure 19 in the form of a disk overlying disk 17 and pivoted to move in its own plane. How this disk is pivoted is not material, but in the present example I utilize as its pivot a mouth-piece or socket 20 which forms the outlet end of the air-duct and is adapted to receive the free end of the air-vent tube and is screwed into or otherwise projects from the disk 17.

Instead of venting the air from the tank by a duct, as 14, in the member 4 I may form an air duct or by-pass 21 in the filling nozzle, as shown in Fig. 4, whereby fuel-admission and air-escape both become effective on the single act of entering the nozzle into the member 4.

Having thus fully described my invention what I claim is:

1. An adapter to be fitted to an inflammable-fluid receiver, said adapter having an opening to communicate with a tubular fluid conductor applied thereto and consisting of an annular gasket having means to form with the receiver a seal around said opening and an inward elastic lip around the opening more yielding continuously thereof than the remainder of said gasket.

2. In combination, an inflammable-fluid re-

ceiver having a tubular filling inlet, and an adapter comprising an annular member having means, acting independently of a force extraneous of the adapter, to grip the inlet and thereby forming between said member and inlet a circumferential seal, and a valve closing the aperture of and movably supported on said member.

3. In combination, an inflammable-fluid receiver having a tubular filling inlet, and an adapter comprising an annular member having means, acting independently of a force extraneous of the adapter, to grip the inlet and thereby forming between said member and inlet a circumferential seal and also means to form with a tubular conductor for supplying fluid to the container a seal around the conductor, and a valve closing the aperture of and movably supported on said member.

4. In combination, an inflammable-fluid receiver having a tubular filling inlet, and an adapter comprising an annular member having means, acting independently of a force extraneous of the adapter, to grip the inlet and thereby forming between said member and inlet a circumferential seal and also electro-insulative means to form with a tubular conductor for supplying fluid to the container a seal around the conductor, and a valve closing the aperture of and movably supported on said member.

5. In combination, an inflammable-fluid receiver having a tubular filling inlet, and an adapter comprising an annular member having means, acting independently of a force extraneous of the adapter, to grip the inlet and thereby forming between said member and inlet a circumferential seal and also means to form with a tubular conductor for supplying fluid to the container a seal around the conductor, and a valve closing the aperture and arranged to be opened and held open by the conductor on the forming of the second-named seal.

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