

C. MARTINI.
 APPARATUS FOR CONVEYING INFLAMMABLE LIQUIDS.
 APPLICATION FILED MAY 9, 1911.

1,004,287.

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Fig. 1.

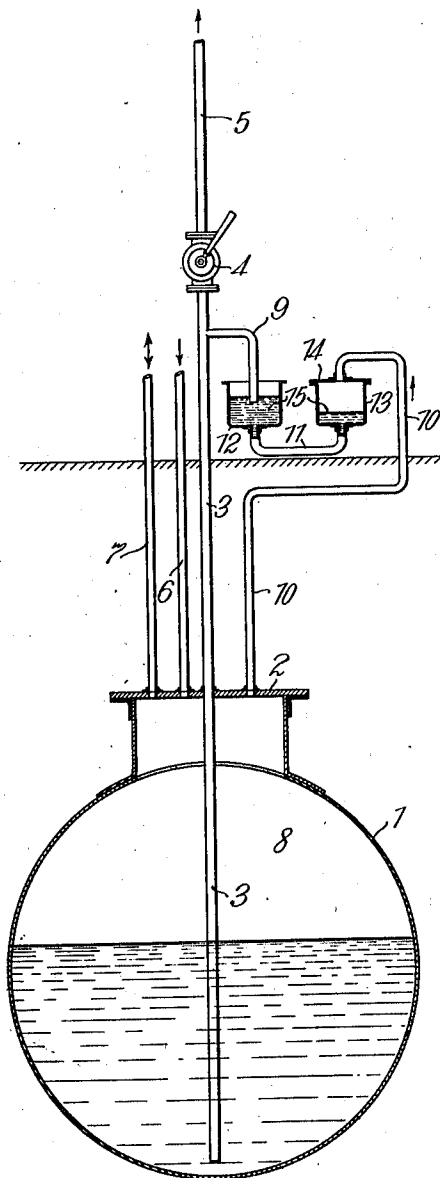


Fig. 2.

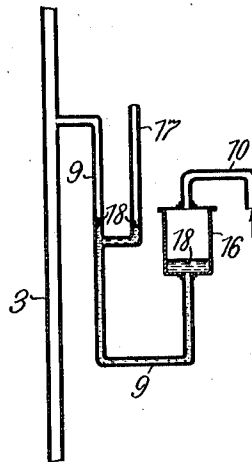
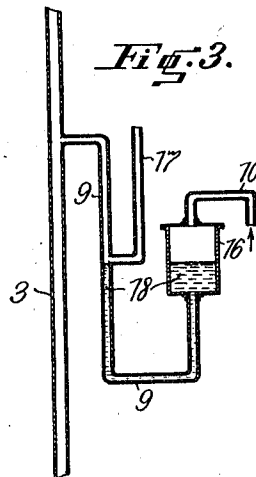


Fig. 3.



Witnesses:

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APPARATUS FOR CONVEYING INFLAMMABLE LIQUIDS.

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To all whom it may concern:

Be it known that I, CARL MARTINI, a citizen of the Empire of Germany, and resident of Berlin, Germany, have invented certain new and useful Improvements in Apparatus for Conveying Inflammable Liquids, of which the following is a specification.

My invention relates to safety devices for conveying apparatus for inflammable liquids. And the object of the improvements is to provide a safety device by means of which the liquid supply to the conveying apparatus is automatically stopped and the drawing in of air into the tank or receptacle, which would form an explosive mixture within the latter, is prevented, as soon as the pressure within the tank falls below a certain minimum.

With this object in view my invention consists in providing a branch conduit between the suction pipe of the pump or the like and the gas chamber of the tank, which branch conduit is provided with a liquid seal which in normal operation automatically closes the branch conduit against the atmosphere, and opens the same when the pressure within the tank falls below the minimum, so that the pump can not raise liquid but only air.

For the purpose of explaining the invention two examples embodying the same have been shown in the accompanying drawing, in which the same numerals of reference have been used in all the views to indicate corresponding parts.

In said drawing—Figure 1, is a vertical section showing a liquid conveying plant in a diagrammatical way, and Figs. 2 and 3, are vertical sections of a modification of the liquid seal provided in the branch conduit of the plant.

In the example shown in Fig. 1, the liquid conveying plant comprises a storing receptacle or tank 1 which is adapted to store the inflammable liquid, and which is closed at its top by a cover 2. Through the latter the suction pipe 3 of a pump 4 is passed which extends downward to a point close to the bottom of the tank 1. The pressure pipe of the pump through which the inflammable liquid is supplied to the place of use has been indicated by the numeral 5. The liquid-charging pipe 6 leads to the cover 2. Furthermore to the cover 2 of the recep-

tacle 1 a pipe 7 is connected through which a non-oxidizable protecting gas under pressure is admitted to or withdrawn from the receptacle.

The gas chamber 8 of the receptacle 1 is connected with a suitable point of the suction pipe 3 of the pump by a branch conduit consisting of two sections 9 and 10. Between the said sections a liquid seal is interposed which consists of an open receptacle 12 and a closed receptacle 13 connected with each other by a pipe 11. The section 9 of the conduit 9, 10 dips with its lower end into the open receptacle 12, and the upper end of the section 10 is connected to the lid 14 of the closed receptacle 13. The liquid seal which is formed by the receptacles 12 and 13 and the pipe 11 contains a suitable liquid, such as mercury, the specific gravity of which is comparatively high, and which by the normal pressure of the protecting gas within the tank 1 and the section 10 of the branch conduit is forced upward within the receptacle 12 to such a level as to close the lower end of the section 9 against the atmosphere. If under these conditions of the plant the pump 4 is started, it conveys the liquid which is stored within the tank 1 and below the non-oxidizable protecting gas to the place of use. If however the pressure of the protecting gas within the chamber 8 of the tank falls below a certain minimum, as might happen for example when the tank 1 leaks or when the supply of the protecting gas is not properly connected to the tank 1, the sealing liquid 15 within the receptacle 12 falls sufficiently by reason of the reduction of the pressure as to open the lower end of the section 9, whereupon the pump 4 draws in air through the section 9 of the branch conduit. Thereby the irregular condition of the plant is at once discovered. While air is conveyed by the pump the inflammable liquid within the tank 1 remains at rest, so that air can not be drawn into the tank 1, as would be the case if the liquid supply were continued.

In the example shown in Figs. 2 and 3 the liquid seal comprises a closed receptacle 16 which is connected at its top with the upper end of the section 10 of the branch conduit and at its bottom with the lower end of the section 9 of the said branch con-

duit. From the section 9 a tube 17 is branched off which at its upper end communicates with the atmosphere. Under normal conditions the suction pipe 3 of the pump is closed against the atmosphere by the sealing liquid 18 which with its upper level is forced into the branch tube 17, while in case of a reduction of the pressure below a certain minimum the sealing liquid sinks and establishes communication between the suction pipe 3 and the atmosphere.

While in describing the invention reference has been made to certain embodiments of the same which in my opinion serve the purpose best, I wish it to be understood that my invention is not limited to the examples shown, and that various changes may be made in the constructions shown without departing from the gist of my invention.

I claim herein as my invention:

1. In an apparatus of the character described, the combination with a closed receptacle adapted to store a liquid, of a conduit communicating with the liquid chamber of said receptacle, means to reduce the pressure within said conduit and to withdraw liquid from said receptacle through the conduit, and means controlled by the pressure within said receptacle and operative when the said pressure falls below a certain minimum to establish communication between said conduit and the atmosphere.

2. In an apparatus of the character described, the combination with a closed receptacle adapted to store a liquid, of a conduit communicating with the liquid chamber of said receptacle, means to reduce the pressure within said conduit and to withdraw liquid from said receptacle through the conduit, a branch pipe connecting said receptacle at a point above the liquid level and said conduit and adapted to open into the

atmosphere, and a liquid seal within said branch pipe controlled by the pressure within the receptacle and adapted to close said branch pipe against the atmosphere while the pressure within the receptacle is above a certain minimum.

3. In an apparatus of the character described the combination with a closed receptacle adapted to store a liquid and having a supply of a protective fluid, of a conduit communicating with the liquid chamber of said receptacle, means to reduce the pressure within said conduit and to withdraw liquid from said receptacle through the conduit, and means controlled by the pressure within said receptacle and operative when the said pressure falls below a certain minimum to establish communication between said conduit and the atmosphere.

4. In an apparatus of the character described, the combination with a closed receptacle adapted to store a liquid and having a supply of a protective fluid, of a conduit communicating with the liquid chamber of said receptacle, means to reduce the pressure within said conduit and to withdraw liquid from said receptacle through the conduit, a branch pipe connecting said receptacle at a point above the liquid level and said conduit and adapted to open into the atmosphere, and a liquid seal within said branch pipe controlled by the pressure within the receptacle and adapted to close said branch pipe against the atmosphere while the pressure within the receptacle is above a certain minimum.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

CARL MARTINI.

Witnesses:

ERNEST CARL OBERHOLTZER,
MARTA L. THOMPSON.