P. & G. R. F. SINIBALDI.

Storage and Delivery Tanks for Explosive and Inflammable Oils.

No. 163,538. Patented May 18, 1875.

Fig. 1.

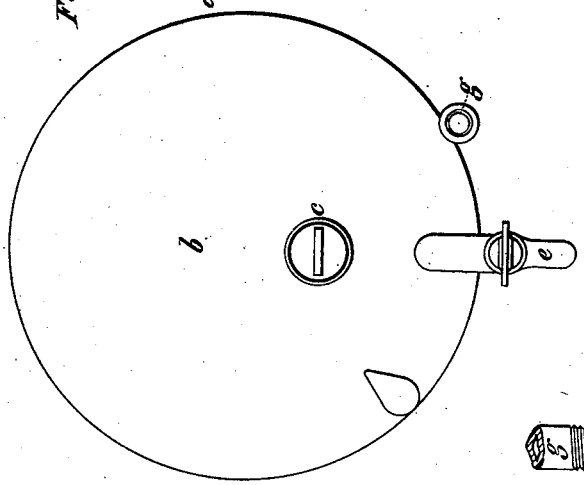


Fig. 4.

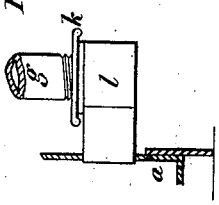
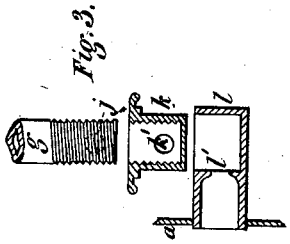


Fig. 3.



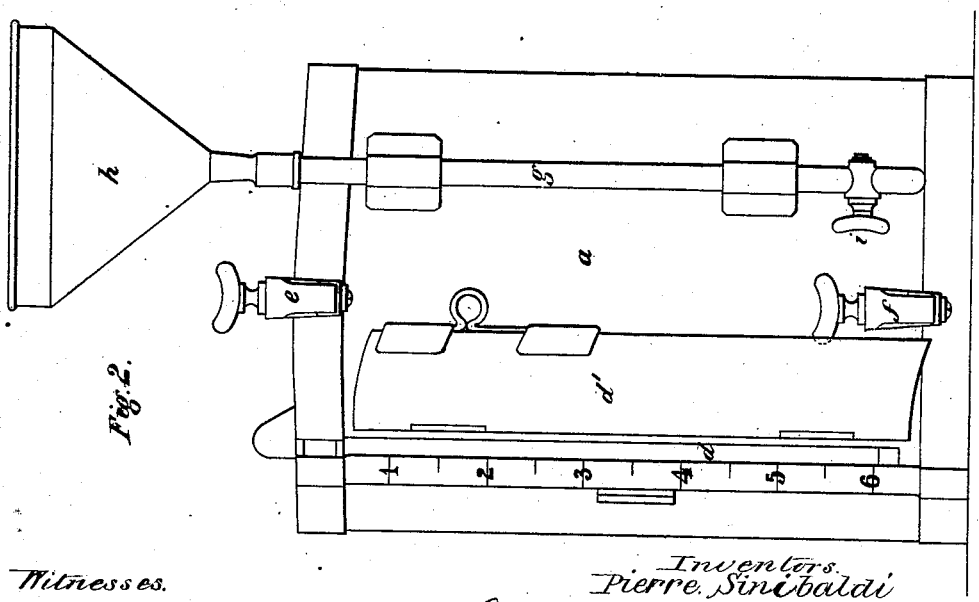


Fig. 2.

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UNITED STATES PATENT OFFICE.

PIERRE SINIBALDI, OF PARIS, FRANCE, AND GEORGE R. F. SINIBALDI, OF LONDON, ENGLAND; SAID GEORGE R. F. SINIBALDI ASSIGNOR, BY MESNE ASSIGNMENTS, TO SAID PIERRE SINIBALDI.

IMPROVEMENT IN STORAGE AND DELIVERY TANKS FOR EXPLOSIVE AND INFLAMMABLE OILS.

Specification forming part of Letters Patent No. **163,538**, dated May 18, 1875; application filed March 6, 1875.

To all whom it may concern:

Be it known that we, PIERRE SINIBALDI, of Paris, France, and GEORGE RAPHAEL FRANCIS SINIBALDI, of London, England, have invented an improved method of and apparatus for preventing the formation and explosion of gas in the storage, transport, and delivery of gaseous or inflammable oil or spirit, of which the following is a specification:

This invention relates to a novel method of and apparatus for preventing explosions of the gas generated from petroleum and other like gaseous and inflammable materials when the same is kept in store, or during its transport or carriage.

The said invention consists, first, in storing the petroleum or other oil or spirit in a receptacle or vessel, in such a manner that it can only be withdrawn therefrom by the introduction of another liquid of different specific gravity, so that there is never any empty space in the vessel above the gaseous liquid, and, therefore, no gas can be generated therefrom to cause an explosion.

The said invention also consists in apparatus constructed as hereinafter specified, and which has a cistern or reservoir of iron or other suitable material, from which the petroleum or other oil is drawn off ready measured, by the hydraulic pressure applied at the base or at the top of the said cistern or reservoir to the oil, through a tube whose upper end is at a higher level than the reservoir.

In cases where it is desired to economize time a force-pump is employed for the introduction of the water for displacing the oil.

Figure 1 is a plan of a cistern or reservoir suitable for the purpose of my invention. Fig. 2 is a front elevation of the same. Figs. 3 and 4 show details of apparatus employed in connection with the said cistern, drawn to an enlarged scale.

Like letters indicate the same parts throughout the drawing.

In Figs. 1 and 2, *a* is the body of the cistern or reservoir. *b* is the top of the same. *c* is the aperture for filling the said cistern with the oil or spirit, the said aperture being provided with a screw-plug or other suitable stopper. *d* is a glass gage for indicating the height of the liquids in the said cistern. *e* is a cock or tap for drawing off or delivering the oil or spirit. *f* is a cock or tap for drawing off the water or other displacing liquid. *g* is the tube for introducing the water into the cistern. *h* is the funnel of the said tube. *i* is a cock or tap for governing the communication between the said tube and the interior of the cistern.

The oil is introduced into the cistern *a* through the aperture *c*, which is then hermetically closed by the screw-stopper. The said cistern or reservoir should be completely filled with oil or inflammable liquid, all the other apertures being closed at the time of its introduction. The funnel of the tube *g* is removable from the said tube. The lower end of this tube opens into the cistern. The water for displacing the oil is poured or forced in, as found most convenient. As above specified, the said tube is provided with a cock or tap, *i*, by which the water is admitted to the cistern or shut off therefrom.

It will be observed that the cistern *a* is higher on one side than the other, and that the cock *e* is placed at the highest part of the highest side of the cistern or reservoir. By this arrangement we obviate the danger of the entrance of air into any small spaces that might exist above the level of the liquid, if the discharge-aperture were placed at such level.

By this arrangement of the admission and discharge cocks and passages it will be seen that the discharge or drawing off of the oil can only be effected by displacing the oil by the water—that is to say, the quantity of oil drawn from the cistern must be replaced by the same quantity of water admitted through the aforesaid tube *g*, and the oil will issue through the delivery-cock *e* as long as water flows into this admission-tube, and no longer. When no more oil is to be drawn the tap *i* of the admission-tube *g* is closed, cutting off the communication between the said tube and the cistern. The gage *d* indicates the quantity of oil in the cistern at any moment. The said gage is preferably protected by a cover, *d'*. When the oil is entirely exhausted the water

is discharged by the cock or tap *f;* or the admission-tube and cock may be unscrewed and removed from the reservoir to discharge the water, thus obviating the necessity of the cock or tap *f*. The admission-tube *g* may either be attached to the reservoir externally, as shown, or internally, or it may be replaced by a passage formed in one piece with the side of the reservoir.

The above description applies more particularly to stationary tanks, cisterns, or reservoirs; but we may construct portable tanks, barrels, or the like in a similar manner, with the exception that, instead of a common cock or tap, as above described, we use the device illustrated in Figs. 3 and 4 in the admission-tube *g*. Fig. 3 shows the separate portions of this device in transverse section. Fig. 4 shows the same in place upon the cistern. This tube is arranged in the position above described. It has a hole, *j*, in one side of its lower extremity, which is fitted in a movable socket, *k*. The latter is fitted to turn in the part *l* of the device, which is fixed in and communicates with the reservoir, as shown. When oil is to be drawn out of the reservoir the said tube is so adjusted in the movable socket of the cock as to bring the orifices *j k'* in the two parts *g k* opposite each other. The water is then poured or forced into the tube *g*, and a half-turn is given to the said tube and cock to form a communication, through the orifice *l'*, between the tube and the interior of the reservoir. The apparatus then operates in the manner above described. The funnel and tube form the measure for the liquid.

When the gaseous or inflammable liquid is a spirit which would mix with water, I use for the displacing-liquid any suitable kind of oil. In this case, as the displacing-liquid would be lighter than the said spirit, the delivery-aperture should be at or near the bottom of the cistern or reservoir.

The advantages of this invention are, that no air is contained in the cistern or reservoir when the same is quite full of oil or spirit, and when any oil or spirit is drawn off its place is taken by the water or other displacing-liquid. Therefore no vacuum is formed in the cistern and no air can enter the same; consequently no gas can be generated. Should the oil-discharge cock or tap be left open inadvertently no oil would escape. Another advantage is, that the quantity of oil drawn off equals that of the water admitted. For instance, if it is desired to draw off a gallon of oil it is only necessary to pour into the funnel a gallon of water.

By using the peculiar cock or tap above described, and shown in Figs. 3 and 4, we avoid the necessity for a separate tube for each reservoir or vessel, one tube serving for any number of cocks or taps of the same size. The said cock or tap can be applied to any existing reservoir or vessel.

We claim as our invention—

1. In a device for the conveyance or storage of inflammable materials, the combination of the following elements: the pipe *g*, provided with the cock *i*, draw-off cocks *e* and *f*, and cistern *a*, substantially as described.

2. The combination, with the cistern or vessel for containing the petroleum or other gaseous liquid, of the water-admission pipe *g*, the oil-discharge pipe *e*, and the taps or cocks for controlling the said pipes and the gage *d*, substantially as herein set forth, and for the purpose specified.

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