W. H. ANDERSON.

Man-Holes for Oil-Tanks.

No. 166,446. Patented Aug. 10, 1875.

Fig. 1

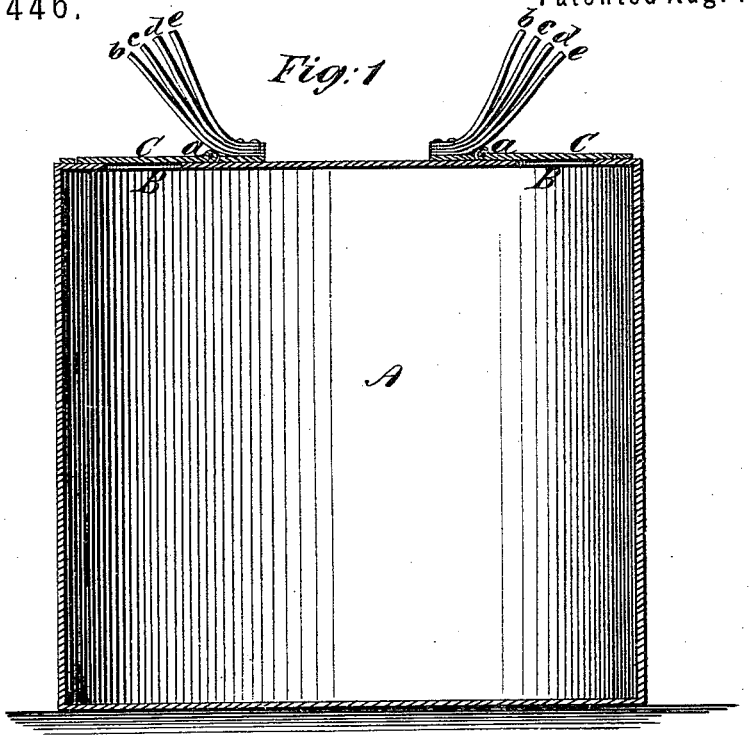
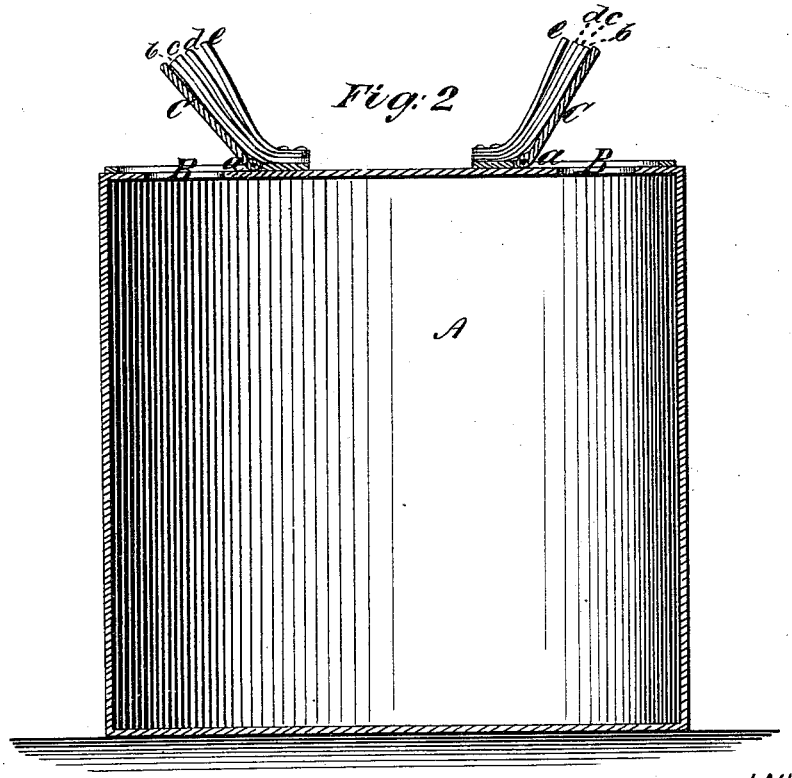


Fig. 2



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM H. ANDERSON, OF BROOKLYN, E. D., NEW YORK, ASSIGNOR OF ONE-HALF HIS RIGHT TO A. J. POUCH, OF SAME PLACE.

IMPROVEMENT IN MAN-HOLES FOR OIL-TANKS.

Specification forming part of Letters Patent No. **166,446**, dated August 10, 1875; application filed November 27, 1874.

To all whom it may concern:

Be it known that I, WILLIAM H. ANDERSON, of Brooklyn, E. D., in the county of Kings and State of New York, have invented certain Improvements in Man-Holes for Oil-Tanks, of which the following is a specification:

This invention is designed to prevent the disastrous results that usually follow the ignition of inflammable vapors generated within petroleum oil-tanks when the same are but partially filled, such ignition commonly occurring from lightning, but sometimes from other causes.

The invention consists in a novel combination of a system of independent springs, arranged to act in succession, with the hinged man-hole plate of an oil-tank, whereby, when the vapors are ignited and give rise to a slight explosion, the man-hole plates, after yielding and being thrown open by the expanded gases, are automatically thrown back to a closed position before the external air can gain access to the oil contained in the tank.

By this means the incipient flame is immediately smothered, the ignition of the oil itself is prevented, and the disasters that would inevitably follow the combustion of the oil are effectually guarded against.

Figure 1 is a central vertical sectional view of an oil-tank constructed with man-holes made according to my invention, the man-hole plates being in their normal or closed position. Fig. 2 is a similar view, representing the man-hole plates in position to be acted upon by the springs to return them quickly to their places after being thrown open by the comparatively slight explosion of vapors which may occur in the upper part of the tank when the latter is only partially filled.

A is the tank, constructed with one or more of the usual man-holes B, each provided with a man-hole plate or cover, C, hinged at one edge, (preferably the innermost or that nearest the center or axis of the tank.) Fixed to the top D of the tank, in close or convenient contiguity to the hinges or pivotal fastenings *a* of each of the man-hole plates, is a set of springs, *b c d e*, arranged in a position more or less inclined over or above the adjacent man-hole plate. The springs of each set branch apart at their upper ends, as shown in Fig. 1.

When from any cause the vapors in the upper part of the tank, when the latter is only partially filled, are ignited and caused to explode, the said explosion throws the man-hole plates suddenly upward, which thus opening the man-holes afford free vent to the sudden outward puff of the gases resulting from this comparatively slight explosion; but before any escape of such gases, sufficient to permit access of external air to the interior of the tank can occur, the contact of the upwardly-moving man-hole plate with the spring *b* causes the latter to act upon the plate with a tendency to return the said plate downward to immediately close the man-hole. If the first spring *b* is not sufficient for the purpose it will be bent back until re-enforced by the spring *e*, and if the two are not sufficient they will be bent back together until re-enforced by the spring *d*, as indicated in Fig. 2, the springs coming together in succession until their accumulated pressure is sufficient to quickly return the man-hole plate to its place to close the man-hole before access of external air to the liquid contents of the tank.

By this means the ignition of said liquid is smothered at the outset, and its combustion and explosion are prevented, the only explosion being the comparatively slight and harmless one of the light vapors that accumulate in the vacant space of the tank, and which are liable to become mingled to a greater or less degree with atmospheric air to form an explosive gaseous mixture.

When desired, a single spring instead of a series may be used for each man-hole; but the arrangement hereinbefore described is much preferred.

When desired, the tank with man-holes thus constructed may be used for holding hydrocarbon liquids other than petroleum with the same advantageous results.

What I claim as my invention is—

The oil-tank constructed with the external

system of independent springs *b c d*, arranged above and behind the usual man-hole plate or cover C, and operating in succession to automatically close the said plate when the same has been thrown open by explosion, the elastic force applied to thus return the plate being thereby proportioned to the force with which it is thrown open, substantially as herein described.

WM. H. ANDERSON.

Witnesses:

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