Feb. 23, 1926. 1,573,938

V. M. HENRIETTA ET AL

STORAGE TANK EMERGENCY VALVE

Filed Feb. 24, 1925

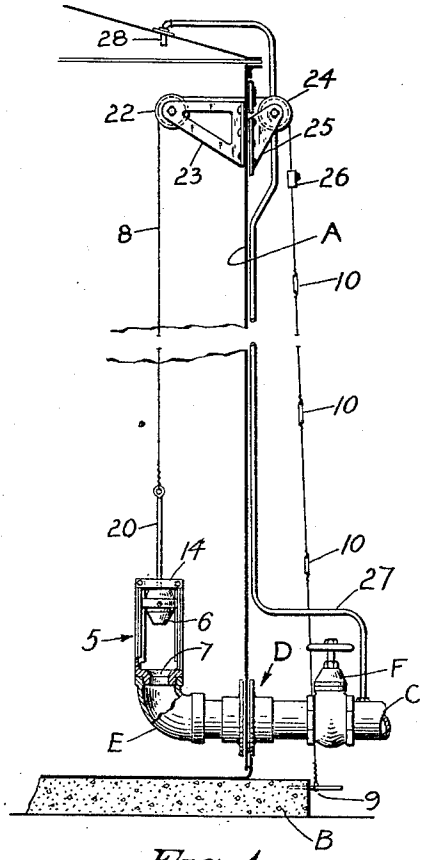


FIG. 1.

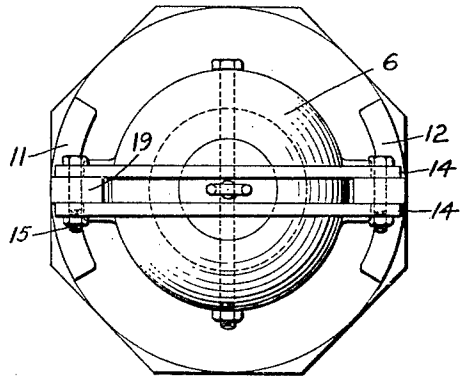


FIG. 2.

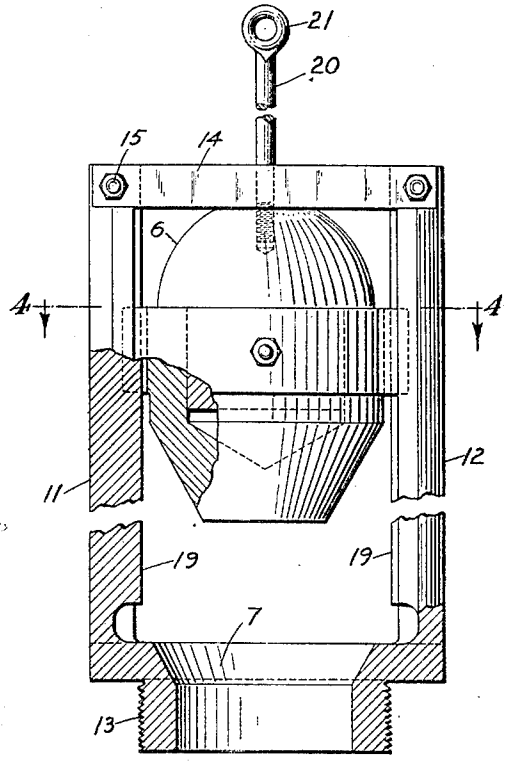


FIG. 3.

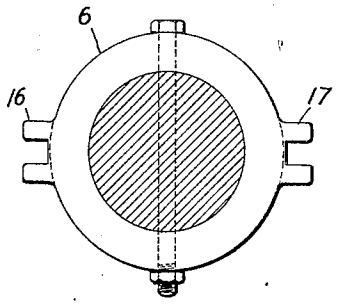


FIG. 4.

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UNITED STATES PATENT OFFICE.

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STORAGE-TANK EMERGENCY VALVE.

Application filed February 24, 1925. Serial No. 11,164.

To all whom it may concern:

Be it known that we, VINCENT M. HENRIETTA and BRONSON B. TELLEY, both citizens of the United States, and residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Storage-Tank Emergency Valves, of which the following is a specification.

Our invention relates in general to valves, and has particular reference to an emergency valve for oil storage tanks.

As now practiced, storage tanks for combustible liquids are equipped with a pipe line from the tank and with a gate valve positioned in the pipe line near the tank, so that the latter can be shut off from the pipe line when desired and especially at night, to eliminate fire hazards as far as possible, and oil losses due to pipe line breaks that may be caused by earthquakes, explosions or otherwise. This valve serves its purpose to a certain extent, yet it is inadequate for all emergencies and among which might be mentioned the danger incident to turning the same off with a fire in the vicinity of the tank. The purpose of our invention is to fortify, so to speak, this valve so that its usefulness need not be dispensed with, and at the same time provide means for assuring a positive safety against fire and other hazards which can not be accomplished by relying on the present valve alone.

In the accompaying sheet of drawings, we have illustrated an application of our improved emergency valve in combination with the above mentioned tank and gate valve.

In said drawings Figure 1 is a vertical section of a portion of a storage tank equipped with our invention; Fig. 2 is a top view of our valve arrangement; Fig. 3 is a view of the valve arrangement in side elevation and partly in section; and Fig. 4 is a cross-section of the valve on the line 4—4 of Fig. 3.

Referring now to the drawings in detail: The letter A represents the storage tank and B the base or foundation for the same.

The pipe from the tank is shown at C and the same extends through the side of the tank at the bottom thereof, and with the usual nipple and flange assembly connection D. The inner end of the pipe is turned up by an elbow E, and is equipped with the valve cage 5 of our emergency device. F represents the customary gate valve above referred to. This valve is located on the pipe outside of the tank, and since it embodies the usual structure for valves of this type it needs no specific mention as to details of construction.

The primary object of our invention is to equip the tank with an internal valve that may be automatically operated to close through the medium of a fusible element when fire is in the vicinity of the tank. With this object in view, we propose to suspend the valve 6 above its seat 7, by the non-corroding cable 8 which in turn is anchored externally of the tank as at 9. The portion of the cable on the outside of the tank is equipped with one or more fusible elements 10 which are adapted to fuse and part the cable to release the valve to its seat, and thus automatically cut off the pipe with respect to the contents of the tank.

The valve cage 5 comprises a pair of oppositely disposed standards 11 and 12, the lower extremities of which are formed integral with the seat 7 and a threaded extension 13 adapted for threaded engagement with the upturned elbow E of the pipe C. These standards 11 and 12 are joined at their upper ends by a pair of transverse bars 14 with bolts 15 making the connection. The inside surface of the standards provide tracks or guides 19 for the radial ears 16 and 17 carried by the valve 6. These ears guide the valve to its seat from its suspended position as shown in Figures 1 and 3. The transverse bars 14 limit the upward travel of the valve 6, and together with the tracks or guides practically confine the valve in the cage 5. The valve is made heavy enough to properly function when released.

Threaded or otherwise attached to the top of the valve, is a bolt or the like 20 having an eye 21 for attaching the end of the cable 8 thereto. The cable extends over a pulley 22 supported on the inside of the tank by a bracket 23, and through the tank wall, and then over another pulley 24 supported on the outside of the tank by a bracket 25.

To prevent the cable from slipping into the tank when the same should part due to a fused element or accident, a suitable block 26 is carried by the cable ahead of the pulley 24; thus when the cable is broken, the block will abut against the tank and arrest the travel of the cable through the same. The block 26 should always be fixed to the cable to leave a greater length between it and the

tank than that of the length of the fall of the valve.

As pipe lines are subject to expansion, we protect the same from excessive pressures therein by the provision of a so called overshot pipe or relief tube 27, which should be connected to the pipe C in front of the valve F, and with its opposite end terminating inside of the tank top as at 28 and which end should always be open.

From the foregoing description taken in connection with the accompanying drawings, the advantages of the construction and method of operation will be readily understood by those skilled in the art to which the invention appertains, and while we have described the principle of operation, together with the device which we now consider to be the best embodiment thereof, we desire to have it understood that the device shown is merely illustrative and that such changes may be made, when desired, as fall within the scope of the appended claims.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent of the United States, is the following:—

1. In combination, a storage tank, a pipe beginning interiorly and terminating exteriorly of the same, a valve on the pipe within the tank, a thermo-control exteriorly of the tank for closing the said valve, said pipe also having a manually operable valve exteriorly of the tank, and a relief tube connecting with the pipe in advance of the manually operable valve and the top of the tank.

2. In combination, a storage tank, a pipe leading into the tank near the bottom thereof and terminating therein in an upturned end, a valve cage mounted on said upturned end, a seat at the base of the cage, a valve in said cage, means for suspending the valve above its seat, a thermo-control on the outside of the tank for releasing the valve to its seat, said pipe also having a manually operable valve exteriorly of the tank, and a relief tube connecting with the pipe in advance of the manually operable valve and the top of the tank.

3. In a storage tank of the class described, a pipe extending into the tank near the bottom thereof, the extremity of the pipe within the tank being turned up, a valve cage threaded to said upturned extremity, a valve seat at the base of said cage, a valve mounted to freely slide vertically within said cage, means for suspending the valve above the seat comprising a cable attach[illegible] at one end to the valve and with its op[illegible] end terminating exteriorly of the [illegible] and anchored to hold the valve s[illegible]d, and a fusible element formed as a part of the cable exterior to the tank and which element when fused will release the valve to its seat.

4. In a storage tank of the class described, a pipe extending into the tank near the bottom thereof, the extremity of the pipe within the tank being turned up, a valve cage threaded to said upturned extremity, a valve seat at the base of said cage, a valve mounted to freely slide vertically within said cage, means for suspending the valve above the seat comprising a cable attached at one end to the valve and with its opposite end terminating exteriorly of the tank and anchored to hold the valve suspended, and a fusible element formed as a part of the cable exterior to the tank and which element when fused will release the valve to its seat, said pipe also having a manually operable valve exteriorly of the tank.

5. In a storage tank of the class described, a pipe extending into the tank near the bottom thereof, the extremity of the pipe within the tank being turned up, a valve cage threaded to said upturned extremity, a valve seat at the base of said cage, a valve mounted to freely slide vertically within said cage, means for suspending the valve above the seat comprising a cable attached at one end to the valve and with its opposite end terminating exteriorly of the tank and anchored to hold the valve suspended, a fusible element formed as a part of the cable exterior to the tank and which element when fused will release the valve to its seat, said pipe also having a manually operable valve exteriorly of the tank, and a relief tube connecting with the pipe in advance of the manually operable valve and the top of the tank.

In testimony whereof we affix our signatures.

VINCENT M. HENRIETTA.
BRONSON B. TELLEY.