

W. J. DONNELL.
 AUTOMATIC FIRE PROTECTOR FOR OIL TANKS.
 APPLICATION FILED SEPT. 8, 1910.

1,011,927.

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Fig. 1.

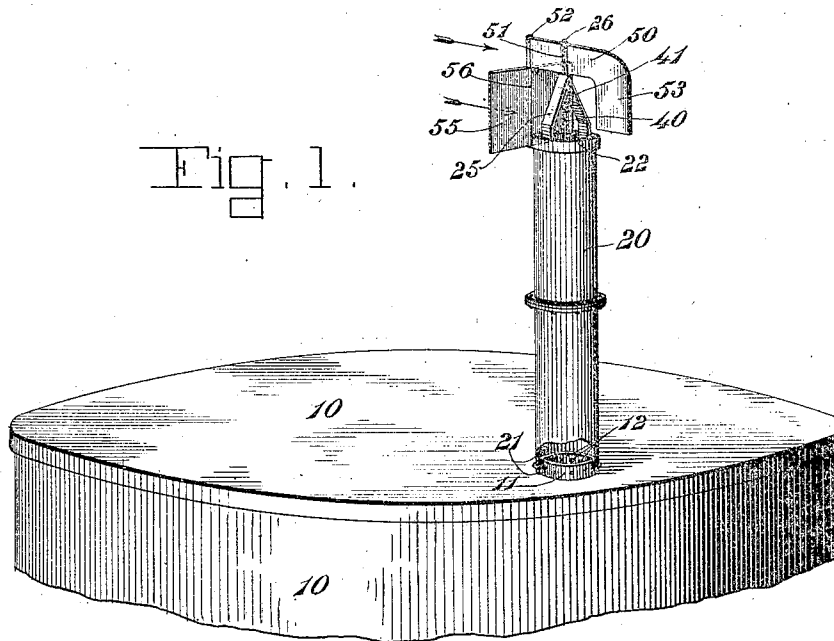


Fig. 2.

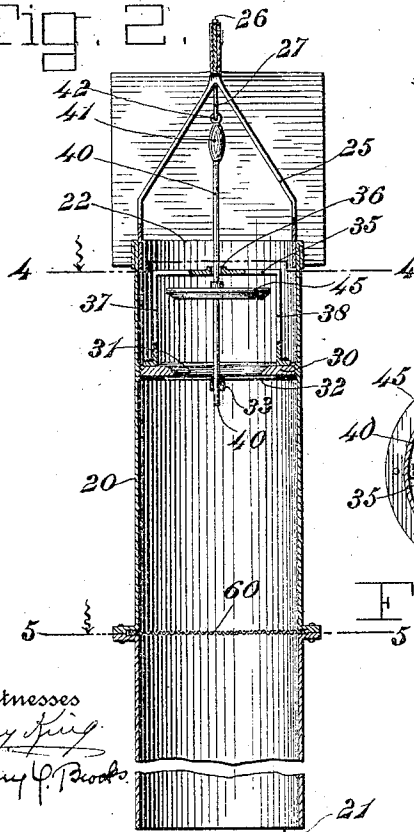


Fig. 3.

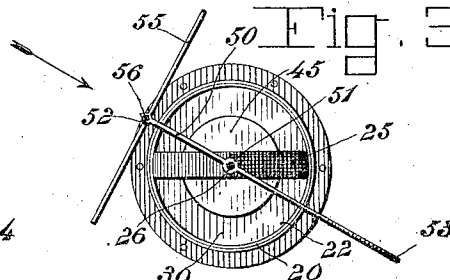


Fig. 4.

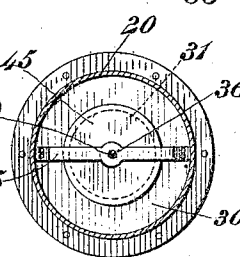
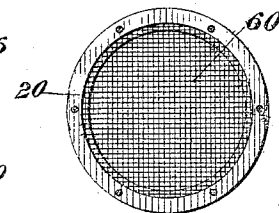


Fig. 5.



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AUTOMATIC FIRE-PROTECTOR FOR OIL-TANKS.

1,011,927.

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To all whom it may concern:

Be it known that I, WILLIAM JAMES DONNELL, a citizen of the United States of America, residing at Kiefer, county of Creek, State of Oklahoma, have invented certain new and useful Improvements in Automatic Fire-Protectors for Oil-Tanks, whereof the following is a specification.

Crude petroleum as it comes from the wells contains some natural gas commingled with it and there is always more or less of such gas escaping from the storage tanks containing the oil. These storage tanks constructed partly of wood and partly of steel or entirely of steel, are disposed in "tank farms" in the oil fields and adjacent to pipe line stations and have capacities ranging from a few hundreds or thousands to fifty thousand barrels of oil. Fires caused by lightning frequently occur among these tanks and destroy each year enormous quantities of oil. The lightning ignites the gas escaping through vents or other openings in the top of the tank and the flames thus started extend to the tanks and their contents and cause explosions which spread the fire.

This invention relates to a simple device applicable to oil tanks and automatically operative to prevent destruction of the contents of said tanks in case the gas usually escaping therefrom becomes ignited by lightning or otherwise.

The object of this invention is to provide an automatic fire protector of this character which is strong and durable in construction and reliable in action.

Figure 1 of the accompanying drawings represents a perspective view of the upper part of an oil tank and of a fire protector applied thereto embodying the preferred form of this invention, parts being broken out to show the connection of said protector with the tank. Fig. 2 represents a vertical section on an enlarged scale of the fire protector detached from the tank and having a part broken out. Fig. 3 represents a plan or top view thereof. Fig. 4 represents a horizontal section on line 4-4 of Fig. 2. Fig. 5 represents a horizontal section on line 5-5 of Fig. 2.

The same reference numbers indicate corresponding parts in all the figures.

A tank for containing crude or other petroleum or other inflammable liquids is indi-

cated by the part marked 10 in the drawings, which shows the top of said tank. The tank so illustrated is a mere example designed to suggest any form of tank for this purpose. The tank so indicated has applied to it a fire protector embodying this invention or one form thereof.

In the form of oil tank fire protector herein illustrated an upwardly extending flue tube 20 is provided with an inlet opening 21 and an outlet opening or orifice 22, said openings being disposed one below the other, the inlet being preferably at the lower end of said tube and the outlet preferably at the upper end thereof. When the tube 20 is applied to an oil tank or other tank to be protected the inlet 21 opens into the upper part of said tank and the outlet 22 opens to the atmosphere some considerable distance from the tank, the tube being so arranged or connected that an outward draft is induced through said tube. In the form shown the outlet is in a plane above the top of the tank.

A suspension frame 25 is secured to the flue tube 20 preferably at or near the top thereof. This frame may be constructed of strap iron and may project to a point above the top of said tube. This suspension frame is provided with an upwardly projecting spindle 26 and with a dependent suspension hook or loop 27.

A collar 30 provided with a valve seat 31 is secured within the tube 20 below the outlet or orifice 22. A guide frame 32 provided with a spindle guide 33 is secured in the tube 20 preferably below said collar and preferably to the under side thereof. A guide frame 35 provided with a spindle guide 36 is secured in the tube 20 above said collar, being preferably provided with legs 37 and 38 attached at their lower ends to said collar.

A vertical valve spindle 40 is adapted to slide in the spindle guides 33 and 36. This spindle is provided preferably at or near its upper end, and disposed above the outlet orifice of the flue tube with a fusible section 41 preferably in the form of a bulb composed of metal which fuses at a comparatively low temperature. The spindle may also be provided above said fusible section with an eye 42 which is made to engage the hook or loop 27, whereby the spindle is suspended within the flue tube 20. A valve

45 adapted to fit the valve seat 31 and completely close the tube 20 is disposed on the spindle 40 between the upper and lower guide frames 32 and 35.

- 5 A vane 50, provided with an intermediate spindle socket 51 and at its front end with an angular socket 52, is swiveled on said spindle socket on the spindle 26 of the suspension frame 25 above the top of the tube 20. A wind shield 55 is secured to the front end of the vane 50 at right angles thereto by any suitable means. The vane shown for this purpose has an angular support or rod 56 which depends from the angular socket 52 and is secured to the vane through the center thereof. The vane is preferably provided with a counterbalancing tail 53, which may extend downward or otherwise.

- 20 A flame guard 60, preferably in the form of a wire gauze diaphragm, is disposed in the tube 20 below the valve seat and serves to prevent the flame from passing downward into the tank. This flame guard is preferably located at the joint between two sections of the flue tube when the latter is constructed in sections.

- Any suitable means may be employed for attaching the fire protector to the tank. In the form shown in the drawings, the lower end of the flue tube 20 is extended through the top of the oil tank 10 and secured thereto by a flanged collar 11 and rivets 12. The joints between the collar and tube and flange and tank top may be screw-threaded or closed by cement, calking or other suitable means. The flue tube is preferably made about six feet long and about six inches in diameter for small storage tanks for crude petroleum and larger in proportion for larger storage tanks.

- In the use of this protective extinguisher applied to an oil tank the tank is closed and gas is permitted to escape therefrom through the flue tube only, this gas passing into the atmosphere at the top of said tube or other point of discharge. If the escaping gas is ignited by lightning, it burns at the point of discharge into the atmosphere which is sufficiently far away from the tank to avoid danger thereto or to its contents, and the wire gauze guard 60 prevents the flame from being drawn into the tank or from passing downward in the tube below said guard. The heat or flame of the so ignited gas soon severs by fusion, combustion or otherwise the support which holds the valve 45 normally in open position. This support comprises the fusible bulb 41 or any fusible or combustible equivalent thereof disposed adjacent to the outlet of the flue tube 20 so as to be within the destructive effect of the flame or heat of the ignited gas which burns at said outlet. When the valve support is severed the valve closes by gravity or otherwise and shuts off the flow of gas through

the tube 20 and thereby puts out the fire before any flame or heat thereof reaches the tank or its contents. The vane 50 swivels freely under the influence of the wind and holds the shield 55 in the face thereof. In case gas is ignited at the orifice of the tube 20, the shield prevents the wind from blowing the heat or flame away from the valve support as 41; consequently the flame at the orifice of the tube is quickly operative to sever such support through fusion or combustion. This extinguishing protector is applicable to other tanks or receptacles containing hydrocarbon or other liquids with which more or less gas is ignited.

I claim as my invention:

1. In a fire protector for an oil tank the combination of a flue tube, a closing mechanism for said tube, means for holding said closing mechanism in open position including a device thermally severable above and in proximity to the outlet of said tube, and means for protecting said device from the wind.

2. In a fire protector for an oil tank the combination of a flue tube, a closing mechanism for said tube, means for holding said closing mechanism in open position including a device thermally severable above and in proximity to the outlet of said tube, a swiveling wind shield mounted on said tube opposite said severable device and a vane controlling the movement of said shield.

3. In a fire protector for an oil tank the combination of a flue tube adapted for attachment to an oil tank, an internal valve seat, spindle guides adjacent thereto, a valve spindle slidable in said guides, a valve for closing said tube secured to said valve spindle and means connected with said valve spindle for normally holding said valve in open position, said means comprising a device thermally severable in proximity to the outlet of said tube.

4. In a fire protector for an oil tank the combination of a flue tube adapted for attachment to an oil tank, a frame mounted on the top thereof, a closing device within said tube, a support for said closing device suspended from said frame and including a thermally severable device disposed above and in proximity to the outlet of said tube, a vane mounted to swivel on said frame, and a wind shield supported by said vane and disposed opposite said severable device.

5. In a fire protector for an oil tank the combination of a flue tube adapted for attachment to an oil tank and provided with an outlet orifice at its upper end and a skeleton frame extending above said orifice and having an upwardly projecting spindle, a valve seat disposed in said flue tube below said orifice, spindle guides adjacent thereto, a valve spindle suspended from said frame and adapted to slide in said guides and pro-

vided above said orifice with a thermally
severable device, a valve attached to said
valve stem and normally held thereby above
said valve seat and adapted to fall into
5 closing relation therewith when said device
is severed by heat; a vane swiveled on said
spindle, and a wind shield suspended from

said vane and maintained thereby in wind-
ward position opposite said severable device.

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