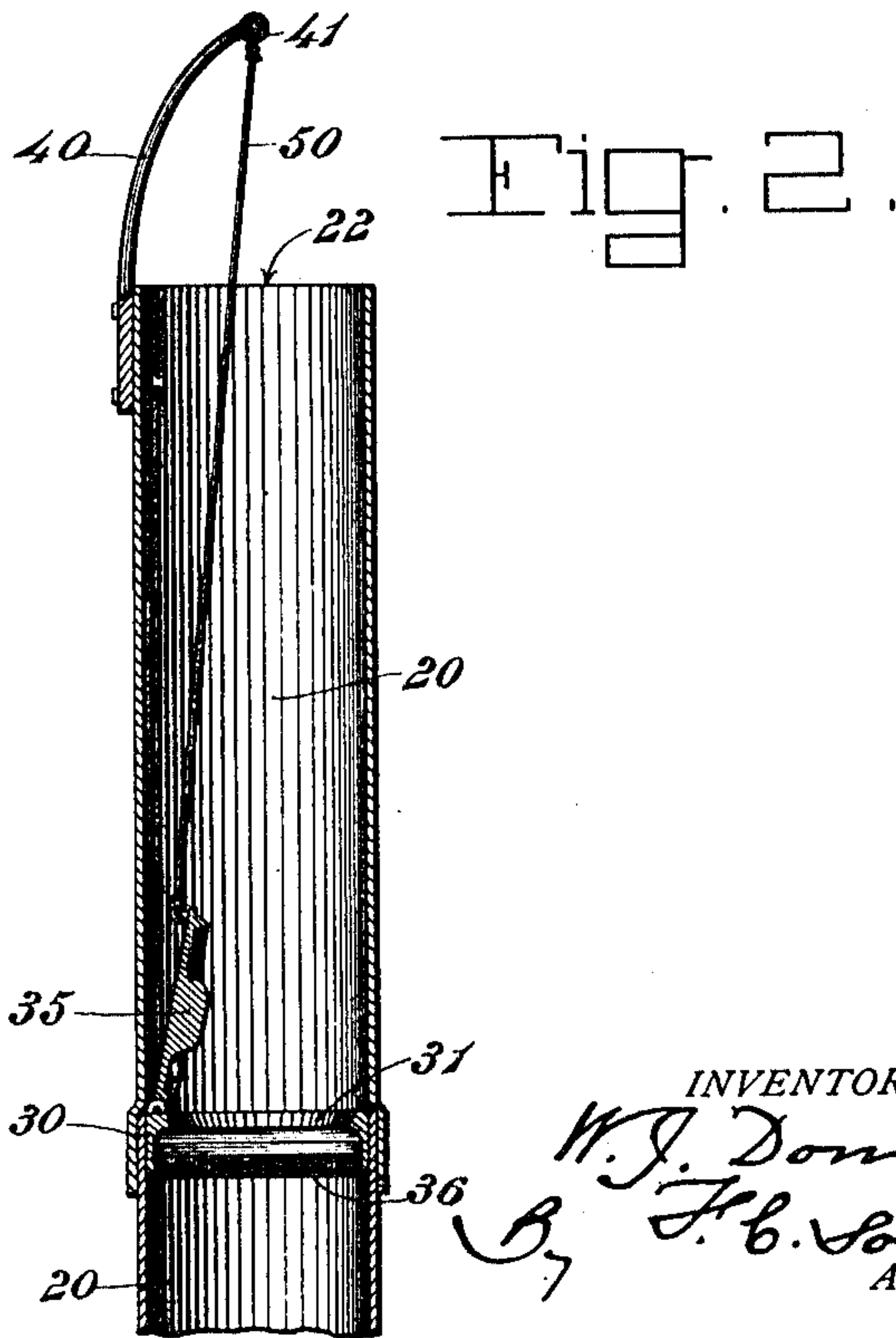
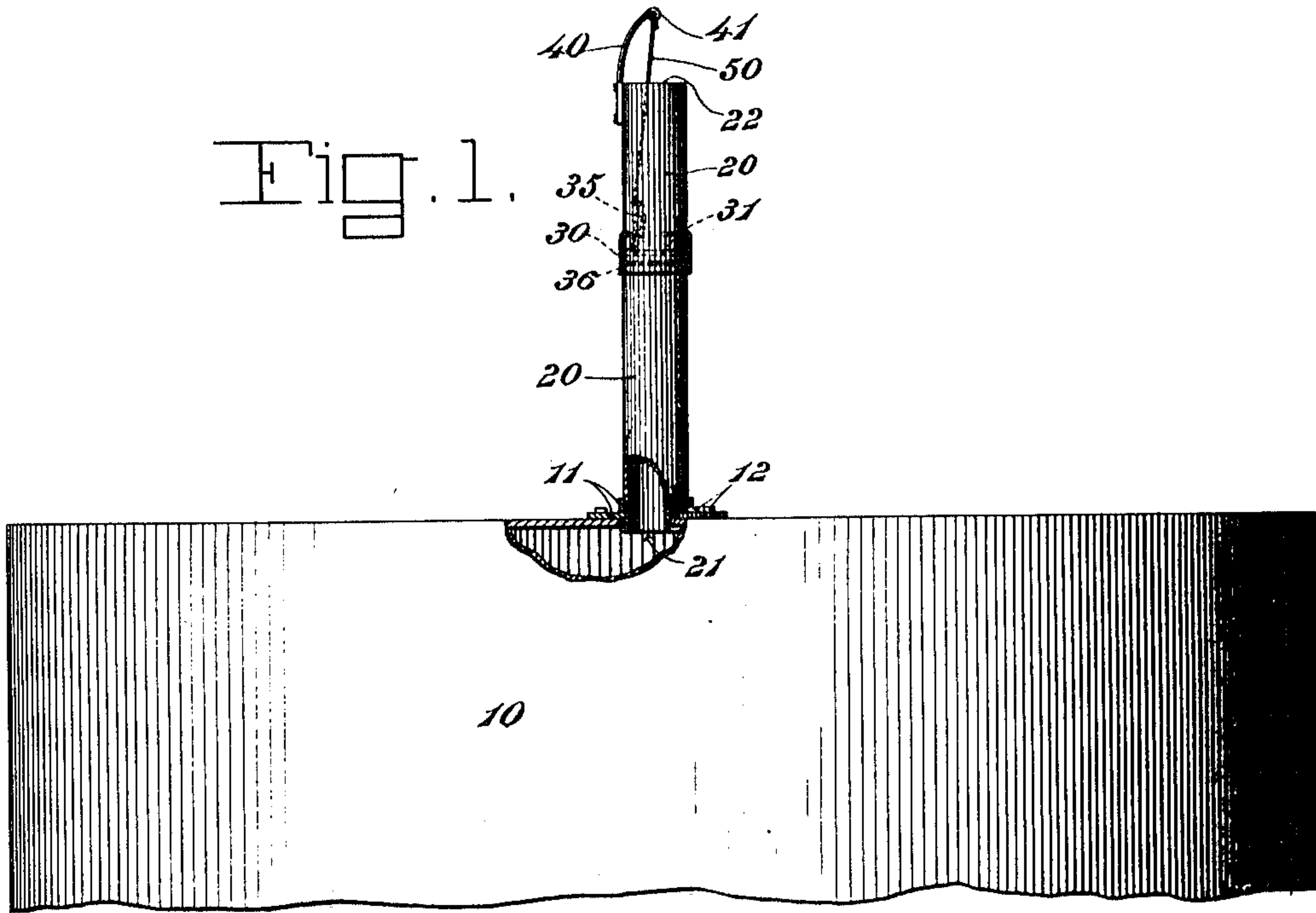


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 AUTOMATIC FIRE PROTECTOR FOR OIL TANKS.
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AUTOMATIC FIRE-PROTECTOR FOR OIL-TANKS.

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Specification of Letters Patent.

Patented Apr. 5, 1910.

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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.

The object of this invention is to provide a protector for oil tanks which will exclude the flames of the ignited gas from contact with the tank or with the body of oil therein and operate automatically to extinguish such flames initially before any damage is done thereby.

The invention consists principally in an oil tank fire protector comprising an upwardly extending flue tube adapted for attachment to an oil tank for collecting the gas escaping from said tank and discharging it into the atmosphere at a point above and away from said tank, and emergency means for automatically closing said tube to shut off the flow of gas therethrough, said means including a device fusible or combustible in proximity to the outlet of said tube where the burning of the gas takes place when accidentally ignited by lightning or otherwise. The tube is also provided with a wire gauze guard which prevents the flame from descending the tube or entering the tank.

Figure 1 of the accompanying drawings represents a side elevation of the upper part of an oil tank and a side elevation of a fire protector applied thereto and embodying the preferred form of this invention,

parts being broken out to show the connection of said protector with the tank. Fig. 2 represents on an enlarged scale a vertical longitudinal section of this fire protector constructed in sections.

The same reference numbers indicate corresponding parts in both figures.

A tank for containing crude or other petroleum or other inflammable gaseous liquid is indicated by the part marked 10, which shows the top portion of such a tank. 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 at the upper end thereof. When applied to a tank the inlet 21 opens into the upper part of the tank and the outlet or orifice 22 opens to the atmosphere some considerable distance above the tank. The tube 20 is preferably constructed in sections united by an overlapped joint or otherwise. An automatic damper 35 for closing said tube is disposed between said inlet and outlet. This damper may be hinged to a collar 30 inserted in the tube, and adapted to shut against a seat 31 formed in said collar. The damper is weighted or otherwise provided with means which close it automatically. A flame guard 36 preferably in the form of a diaphragm composed of wire gauze is disposed in the tube 20 below said damper.

Means normally operative to hold the damper 35 in open position include a device fusible or otherwise thermally severable in proximity to the outlet of said tube so as to be broken or severed to release the damper by the heat of a flame ignited by lightning or otherwise and burning at the orifice of said tube. Any suitable means may be employed for this purpose. The means shown comprise an arm 40 provided with an eye or hook 41, and a suspension device 50. In use the arm 40 is secured to the tube 20 near the top thereof and its upper end preferably overhangs the outlet opening 22 of said tube. The suspension device 50 is stretched between the hook of said arm and the damper 35 swung upward in open position, said sus-

pension device passing through the outlet orifice 22 of said tube and being composed of combustible or fusible material at least in some portion of its structure in proximity to said outlet.

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 screwthreaded 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. If the escaping gas be ignited by lightning, it burns at the discharge end of said tube at a point sufficiently far away from the tank to avoid danger thereto or to its contents, and the wire gauze guard 36 prevents the flame from being drawn into the tank or from passing downward in the tube below said guard. The heat of the flame of the so ignited gas soon severs by combustion, fusing or otherwise, the flexible support 50 which holds the weighted damper 35 in open position. When this support is thus severed the damper closes by gravity or otherwise and shuts off the flow of gas through the tube 20 and puts out the fire before any heat therefrom reaches the tank or its contents.

This protective extinguisher is applicable to either tanks or receptacles containing hydrocarbon or other liquids with which more or less gas is commingled.

I claim as my invention:

1. An oil tank fire protector comprising an upwardly extending flue tube adapted for attachment to an oil tank for collecting the gas escaping from said tank and discharging it into the atmosphere at a point above and away from said tank, and emergency means for automatically closing said tube to shut off the flow of gas therethrough, said means including a device thermally severable in proximity to the outlet of said tube where the burning of the gas takes place when accidentally ignited by lightning or otherwise.

2. An oil tank fire protector comprising an upwardly extending flue tube adapted for attachment to an oil tank for collecting the gas escaping from said tank and discharging it into the atmosphere at a point above and away from said tank, a flame

guard disposed in said tube, and emergency means for automatically closing said tube to shut off the flow of gas therethrough, said means including a device thermally severable in proximity to the outlet of said tube where the burning of the gas takes place when accidentally ignited by lightning or otherwise.

3. An oil tank fire protector comprising an upwardly extending flue tube adapted for attachment to an oil tank and having inlet and outlet openings disposed apart from each other, the inlet being below the outlet, a damper between said inlet and outlet and operative automatically to close said tube, and means normally operative to hold said damper in open position, said means including a support thermally severable in proximity to said outlet to release said damper in case of accidental fire at said outlet of the gases conveyed through said tube.

4. An oil tank fire protector comprising an upwardly extending flue tube adapted for attachment to an oil tank and having inlet and outlet openings disposed apart from each other, the inlet being below the outlet, a damper between said inlet and outlet and operative automatically to close said tube, a flame guard disposed in said tube below said damper, and means normally operative to hold said damper in open position, said means including a support thermally severable in proximity to said outlet to release said damper in case of accidental fire at said outlet of the gases conveyed through said tube.

5. The combination of a closed oil tank, an upwardly extending flue tube having an inlet open into the upper part of said tank and a discharge orifice above the top of said tank, an automatic damper disposed in said tube between said inlet and outlet, a support for said damper operative to normally hold it in open position, said support being thermally severable in proximity to said orifice to automatically release said damper in case of fire at said outlet of the gases conveyed through said tube.

6. A fire protector for an oil tank comprising a flue tube for attachment to such tank, an automatic damper for closing said flue tube, an arm secured to said flue tube near the orifice thereof, and a thermally severable support connected with said arm and adapted for normally holding said damper in open position.

7. A fire protector for an oil tank comprising a flue tube for attachment to such tank, an automatic damper for closing said flue tube, an arm secured to said flue tube near the orifice thereof and extending approximately over the axis thereof, and a thermally severable support connected with said arm and adapted for normally holding said damper in open position.

8. A fire protector for an oil tank comprising a sectional flue tube for connection with an oil tank, a collar disposed in the upper end of one section of said flue tube
5 and provided with a damper seat, an automatic damper for closing said tube supported on said collar, an arm secured to the outer end of the outer section of said flue tube and a thermally severable support connecting said arm with said damper.
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9. A fire protector for an oil tank com-

prising a flue tube for connection with such tank, an automatic damper for closing said tube, an arm extending above the orifice of said tube and a thermally severable support
15 connecting with said damper and above said orifice with said arm.

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Witnesses:

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