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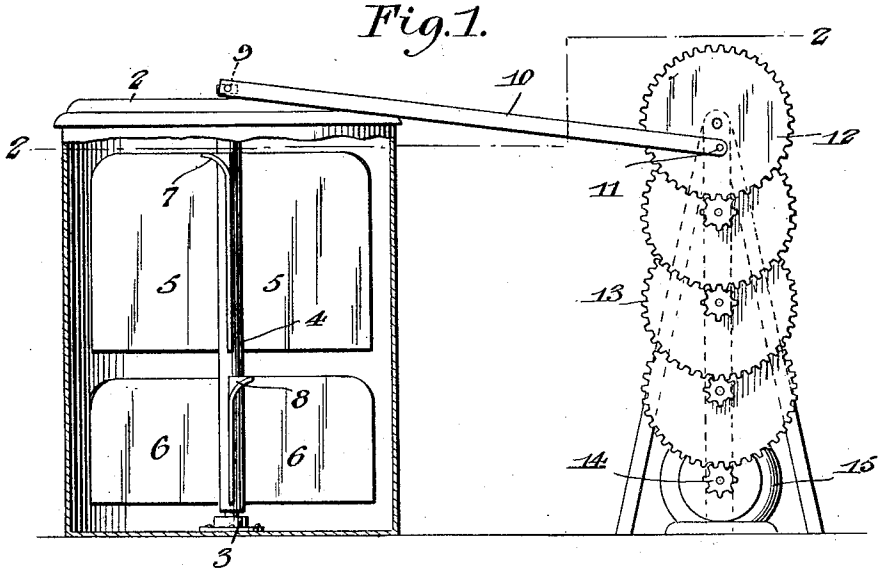
G. W. EARLE.

METHOD OF PREVENTING OR EXTINGUISHING FIRES IN OIL TANKS.

APPLICATION FILED OCT. 25, 1916.

1,221,038. Patented Apr. 3, 1917.

Fig. 1.



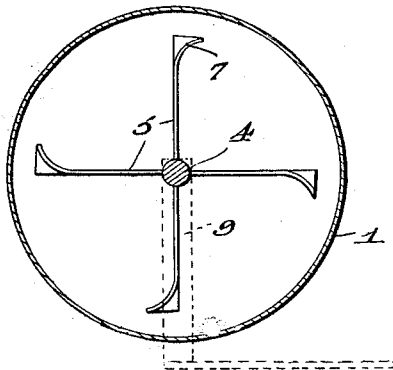


Fig. 2.

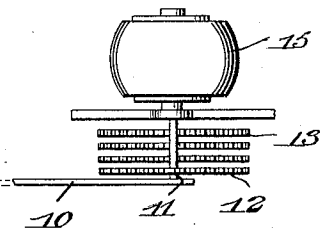
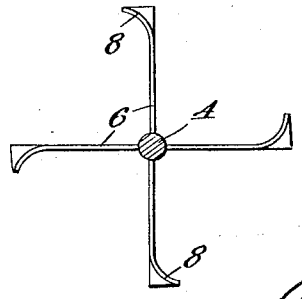


Fig. 3.



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UNITED STATES PATENT OFFICE.

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METHOD OF PREVENTING OR EXTINGUISHING FIRES IN OIL-TANKS.

1,221,038. Specification of Letters Patent. Patented Apr. 3, 1917.

Original application filed July 23, 1913, Serial No. 780,751. Divided and this application filed October 25, 1916. Serial No. 127,669.

To all whom it may concern:

Be it known that I, GEORGE W. EARLE, a citizen of the United States, residing at Hempstead, in the county of Nassau and State of New York, have invented new and useful Improvements in Methods of Preventing or Extinguishing Fires in Oil-Tanks Containing Oil, of which the following is a specification.

This invention relates to a method of preventing or extinguishing fires in tanks or receptacles containing illuminating or other oils which are being stored or bleached, the primary object of the invention being to provide a method of agitating the oil in such a manner as to keep the temperature of the oil at the surface below the combustion point, thus preventing the oil from catching fire, in the event of such danger, or extinguishing the oil if already ignited or extinguishing the flames in the event of the oil having caught fire.

A further object of the invention is to provide a method whereby oil may be treated for the purposes described without in any way injuring or impairing the quality of the same.

The present application is a division of my prior application No. 780,751, filed July 23, 1913.

In the carrying out of my invention, I may employ any suitable type of apparatus, one adapted for the purpose being illustrated in the accompanying drawing, in which:—

Figure 1 is a view in elevation, the tank appearing in vertical section, of a fire extinguishing device applied for use in carrying my method into practical effect.

Fig. 2 is a sectional plan view on the line 2—2 of Fig. 1.

Fig. 3 is a view of the agitator *per se*.

Referring to the drawing, showing a form of apparatus for carrying my method into practice, 1 designates a tank or receptacle of the kind employed for containing crude, illuminating or other oils which are being stored or bleached, which may be either open or closed at the top and which is shown in the present instance as provided with a closed top 2. Journaled at its upper and lower ends in the top 2, and in a stepped bearing 3 at the bottom of the tank is a vertical shaft 4, upon which are mounted two superposed sets or series of radial agitator blades 5 and 6. Any suitable number of blades in each set or series may be employed, and the blades of one set are provided with flanges 7 bent laterally in one direction, while the blades of the other set are provided with flanges 8 bent laterally in the opposite direction, whereby in the back-and-forth oscillations of the shaft 4 the oil will be agitated in a prescribed manner, as hereinafter fully described.

For the purpose of operating the agitator, I provide the shaft 4 with a crank arm 9, pivotally coupled by a pitman rod 10 to a crank gear 12. The gear 12 is driven through a series or train of speed reducing gears 19 from a pinion 14 on the armature shaft of an electric or other suitable motor 15, whereby when the motor is set into action motion will be communicated through the gear train 13 at a comparatively slow and regulated rate of speed to the crank gear 12, which in turn, through the crank and pitman mechanism, will oscillate the agitator. It will thus be understood that when occasion arises the agitator may be thrown into action by starting the motor to agitate the body of oil for the purpose of preventing the same from catching fire, or for the purpose of smothering and extinguishing the flames in the event that the oil has caught fire.

Tanks containing crude, kerosene and other oils for storage or other purposes are frequently struck by lightning, resulting in the oil being set on fire, with a consequent loss of the oil and destruction of the tank, and liability of a general conflagration due to the spreading of the fire to other and adjacent oil tanks. Heretofore, the only method known, so far as I am aware, for extinguishing flames in a tank in which the oil has caught fire has been through the use of a chemical extinguishing agent, and then, in order to be effective, must be employed immediately at the start of the fire. Such method is objectionable, however, for the reasons stated, and for the further reason that the salvaged oil must be later subjected, at more or less extent, to treatment in order to free it from the extinguishing agent used. The object of my invention is to provide a method, whereby the oil may be agitated, either to prevent it from catching fire or to extinguish an existing fire, without injury to the body of oil, and entirely without the

trouble and expense attached, as in the use of a chemical extinguishing agent, for purifying the oil again after treatment.

In the operation of the agitator for carrying the method into practice, the agitator blades are oscillated at a proper rate of speed to agitate the body of oil and avoid a too rapid agitation thereof of a character liable to cause excessive surface agitation and the spreading of the flames instead of their extinguishment. It will be observed that the blades 10 carry the body of oil around alternately in opposite directions, and that in addition the flanges 7 operate to impart an up and down motion to the body of oil. By these actions of the blades upon the body of oil the portions of oil composing said body at different levels are caused to slowly but positively change their positions, as a result of which up and down currents of the oil are established. By this means the portions of the oil at the surface, which by reason of exposure are liable to be of higher temperature than the remainder of the oil or which are raised to higher temperature when ignited, are caused to mix with the other and cooler portions of the body of oil and a constant change in the portions of oil takes place, the oil at the surface being drawn downwardly and the cooler oil from below taking its place, by means of which the oil at the surface will be maintained at a temperature below the combustion point of the oil, whatever it may be. As a result, the oil at the surface will be reduced to a temperature below the combustion point, with a consequent extinguishment of the flames, which, practical experimentation has shown, will be effective, ordinarily in from five to ten seconds after the agitator is set into action. It will thus be understood that when the oil in the tank catches fire, due to a bolt of lightning striking the tank or other causes, the apparatus may be immediately set into operation to extinguish the flames and prevent destruction of the tank and its contents as well as the spreading of the fire to other tanks or adjoining property. The apparatus may also be employed during the prevalence of a lightning storm for the purpose of keeping the oil within the tank in a state of motion so as to prevent it from catching fire in the event of the tank being struck by lightning.

In the use of an apparatus of the character described it is to be understood, of course, that the apparatus may be arranged either vertically, as shown, or horizontally, and that the method may be carried into practice by hand operated paddles or other means actuated by the operator, mechanical means of the character described to be, however, preferably employed in order to secure safety to the operator as well as other obvious advantages.

I claim:—

1. The method of preventing or extinguishing fires in oil tanks, which consists in imparting motion to the body of oil in such a manner as to maintain or reduce the temperature of the oil at the surface below its combustion point.

2. The method of preventing or extinguishing fires in oil tanks, which consists in agitating the oil so as to produce up and down currents to cause the oil at the surface to pass downward and the cooler oil below to take its place, whereby to maintain or reduce the temperature of the oil at the surface to a point below the combustion point.

3. The herein described process of preventing or extinguishing fires in oil tanks, which consists in agitating the body of oil within the tank.

4. The herein described process of preventing or extinguishing fires in oil tanks, which consists in agitating the body of oil within the tank by an oscillating motion.

In testimony whereof I affix my signature.

GEORGE W. EARLE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."