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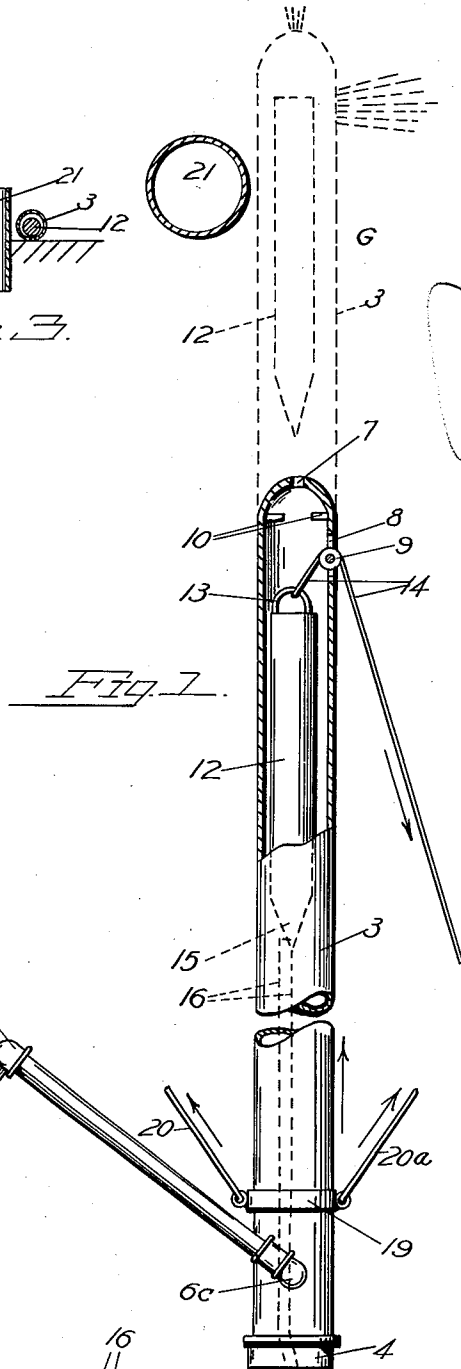
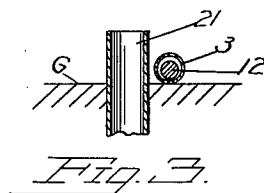
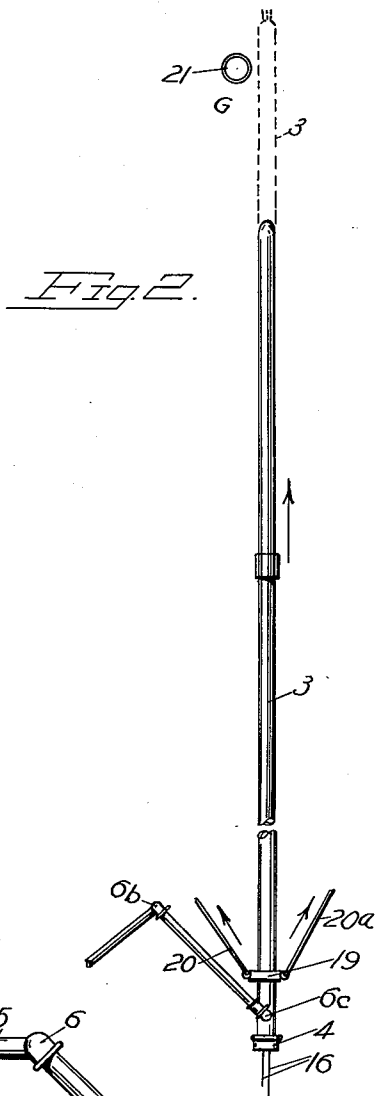
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MEANS AND METHOD FOR EXTINGUISHING OIL WELL FIRES

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MEANS AND METHOD FOR EXTINGUISHING
OIL WELL FIRES

Frank Lesh, Casper, Wyo.

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11 Claims. (Cl. 169—4)

This invention relates to a method and means for extinguishing oil well fires. Such fires are usually very difficult to control and extinguish, and they present a great hazard to human life and property.

An object of the invention is to provide a method and means whereby an oil well fire may be extinguished quickly, positively, and economically.

Another object is to provide a method and apparatus for extinguishing oil well fires that will insure the safety of the operators using it.

A further object of the invention is to provide a heat-resistant container for the explosive medium used in extinguishing oil well fires that may be moved into operative position adjacent a burning well without damage to the explosive from the heat.

Other objects and advantages will be disclosed in the following description, and in the drawing which forms a part thereof.

In the drawing in which like parts have been similarly designated,

Figure 1 is a plan view, partially in section, of an apparatus, built in accordance with the invention, and illustrating the method of using the same.

Figure 2 is a plan view of a modified form of the apparatus; and

Figure 3 is a vertical section through an oil well and the apparatus embodying the present invention with the latter in final operating position adjacent to the well.

In Figure 1, reference character 3 denotes a housing or conduit capable of conducting water under pressure, and preferably formed by connecting sections of well casing. A removable cap 4 is provided at one end of the housing and a supply pipe or conduit 5 conducts water under pressure from a source (not shown) into the housing, adjacent the capped end thereof, through swing joints 6, 6a, 6b, and 6c, which permit the housing 3 to be moved with reference to the source of water, while maintaining the connection between the water supply line 5 and the conduit.

In the end of the conduit opposite the cap, an opening 7 is provided and the side of the conduit adjacent said opening has a slot 8 in which is mounted a pulley 9.

An explosive torpedo 12, of the usual oil well type is placed in housing 3 and has a bail 13 on one end, to which is attached a cable 14, which passes over pulley 9, to the outside of the conduit. Thus, the torpedo is adapted for movement in the housing, and stops 10 are provided near the

pulley to limit the extent of its movement therein.

The other end of the torpedo is pointed as indicated at 15, and is provided with electrical wires 16 that are attached to a detonating cap in the pointed end. The electrical wires extend from the torpedo back through the conduit and out through cap 4, and thence to a push button 17 and battery 18.

Fastened to the housing 3 at any convenient place and preferably near its capped end is a connection 19, carrying two draw cables 20 and 20a which are used in moving the housing into an operative position. The oil well that is to be worked upon is represented at 21.

As is well known to those familiar with oil field operations a well occasionally catches fire from various causes, such as accident, carelessness, or lightning. Some wells spout oil and gas under tremendous natural pressure, and ordinary means for fire fighting are absolutely futile whenever such a well catches fire.

In performing the present invention, the conduit or housing 3 is assembled on the surface of the ground G with the end, having the opening 7 therein, as near to the fire as the heat from the same will permit the men to work. The other end of the housing, which may be as long as safety dictates, is left open until the explosive torpedo 12 is inserted, whereupon it is capped and the detonating wires passing through the cap are strung out to any safe distance.

The cable 14 having been connected to the bail of the torpedo, the torpedo can be pulled forward in the conduit to a position adjacent the end toward the fire, when desired the operators being able to remain a safe distance from the fire and the torpedo during this operation.

The water supply line 5 is flexibly and extensively connected to the conduit by and through swing joints 6, 6a, 6b, and 6c or, if preferred, a rubber hose with plenty of coils or slack in it, or similar means would be satisfactory for this purpose.

Suitable motive power, such as trucks, tractors or teams or horses, is hitched to each draw cable 20 and 20a, and applies force in angular directions as indicated by the arrows Figure 2. The resultant force acting on the housing is in the direction of its axis, with the result that the housing slides along the ground. Rollers, skids or wheels may be provided to facilitate this movement when desired. As the conduit moves forward to bring its forward end adjacent the fire, water or other cooling fluid is pumped into

and through it, to insulate it as it approaches the heat of the flame. The water is flowed past and around the torpedo, and discharged freely out through opening 7 and slot 8, to set up a free circulation, thereby avoiding the formation of steam.

Preferably the conduit is moved so that its forward end comes in close proximity to and at one side of the well casing, as shown in the dotted lines. As it is being moved forward to this position, the cable 14, which is attached to the torpedo, is pulled to move the explosive to a location within the heat-insulated conduit, near the forward end.

When the torpedo arrives at a point adjacent the fire, an operator presses the push button to detonate the charge of explosive, which may be solidified nitroglycerine, dynamite, or any other suitable material. The force of the explosion blows the end of the conduit open, and so disrupts the burning oil and gas that the flame is extinguished instantly, while all workers have remained at a safe distance. Two or more torpedoes may be used by connecting them together, to increase the explosive force.

The form of the invention as disclosed in Figure 2, is quite similar to Figure 1, but the pulley and cable for drawing the explosive torpedo through the conduit, have been eliminated. In this form, the torpedo is inserted in the rear end of the conduit to a point ahead of the water inlet 6c, whereupon the conduit is capped, and as the conduit is moved forward, as above explained, water under pressure is introduced into the conduit, and the torpedo being of a size to slide easily is thereby moved forward to the stops which are shown at 10, Figure 1.

Any desired arrangement of discharge openings for the water adjacent the forward end of the conduit may be made to insure free circulation, and as the conduit and torpedo within arrive at the side of the fire, an operator detonates the charge as above described.

In both forms of the invention, the water-cooled conduit serves as a means for placing the explosive charge adjacent the fire and protecting it from detonation due to the heat until such time as the operator presses the switch button.

The cooling fluid is usually water, but may be any fluid that can be flowed through the conduit that houses the explosive charge. This fluid protects the charge from excessive temperatures from the fire, by insulating it against inward penetration of the heat, and by conducting the heat units away from the torpedo, and out of the housing. Likewise, when metallic casing is used for the housing, the cooling fluid prevents melting of the same, which otherwise would result in many instances.

The stopping of the cooling medium supply would, under certain circumstances, detonate the explosive charge without the aid of the electrical equipment or other means of firing, and the explosion can thus be accomplished, whenever it is not convenient to use electrical detonators or other firing devices.

While the use of a cooling fluid for heat insulating the torpedo is preferable for many reasons, it will be understood that the conduit may be wrapped in asbestos or other heat-insulating material, or the torpedo may be encased with any suitable heat-insulating covering.

Further, it is to be understood that while the specific means shown for moving the housing into a position of operation is highly efficient, any

method of moving the heat-insulated torpedo into the proximity of the well may be employed, within the spirit and scope of the invention.

Changes and modifications may be availed of within the spirit and scope of the invention as defined in the hereunto appended claims.

What I claim and desire to secure by Letters Patent is:—

1. In a method for extinguishing oil well fires, the steps of moving an explosive body in proximity to a burning oil well, and heat-insulating the body during the said movement, by a flow of a cooling fluid about the body.

2. A method for extinguishing oil well fires, which comprises the movement of an enclosed explosive body in proximity to a burning oil well, flowing a cooling fluid past the body within the confined zone during said movement, and exploding the body while in proximity to the well.

3. A method for extinguishing oil well fires, which comprises the movement of an explosive body containing a detonator, in proximity to a burning oil well, maintaining the body in heat-insulated condition during the said movement by flowing a cooling fluid past the body, and exploding the body while in proximity to the well by the medium of the detonator.

4. A method for extinguishing oil well fires, which comprises the movement of an explosive body in proximity to a burning oil well, maintaining the body in heat-insulated condition during the said movement by flowing a cooling fluid past the body, and exploding the body in proximity to the well.

5. Apparatus of the character described, comprising a housing provided with a discharge outlet, and an inlet for a cooling fluid, an explosive torpedo in the housing, means for introducing a cooling-fluid thru the inlet to heat-insulate the torpedo, and a mechanism for exploding the torpedo.

6. Apparatus of the character described, comprising a housing provided with a discharge outlet, and an inlet for a cooling fluid, an explosive torpedo in the housing, a flexible conduit connected with the inlet for introducing a cooling-fluid thru the inlet to heat-insulate the torpedo, and a mechanism for exploding the torpedo.

7. Apparatus of the character described, comprising a housing provided with a discharge outlet, and an inlet for a cooling fluid, an explosive torpedo in the housing, an extensible conduit connected with the inlet, for introducing a cooling-fluid thru the inlet to heat-insulate the torpedo, and a mechanism for exploding the torpedo.

8. Apparatus of the character described, comprising a housing provided with a discharge outlet adjacent one of its ends, and having an inlet for a cooling fluid distant from said end, an explosive torpedo in the housing, means for introducing a cooling fluid thru the inlet to heat-insulate the torpedo, and a mechanism for exploding the torpedo.

9. Apparatus of the character described, comprising a housing provided with a discharge outlet and an inlet for a cooling fluid, a torpedo movable in the housing, an element for moving the torpedo to selective positions in the housing, means for introducing a cooling fluid thru the inlet to heat-insulate the torpedo, and a mechanism for exploding the torpedo.

10. Apparatus of the character described, comprising a housing movable to a point of operation and provided with a discharge outlet and an inlet for a cooling fluid, a torpedo movable in the

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housing, an extensible conduit connected with the inlet for introducing a cooling fluid there-through to heat-insulate the torpedo, and means operable from the exterior of the housing for
5 moving the torpedo to selective positions within the same.

fire, which comprises moving a charge of explosive into proximity to the fire, preventing premature detonation by a flow of cooling fluid across the explosive, and detonating the explosive at a predetermined time.

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11. The method of extinguishing an oil-well