

F. THOMAS.
IGNITER.

APPLICATION FILED FEB. 23, 1911.

Patented Dec. 10, 1912.

2 SHEETS—SHEET 1.

1,046,898.

Fig. 1.

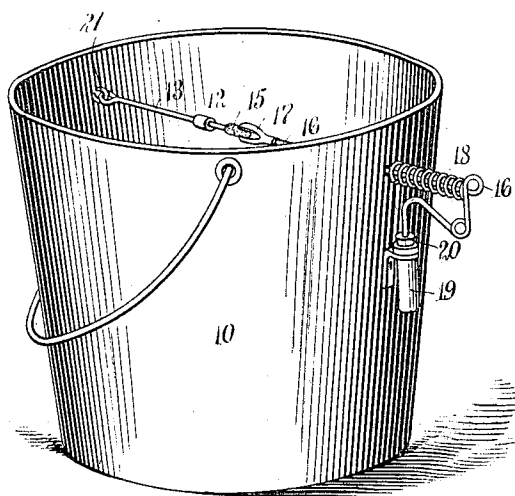
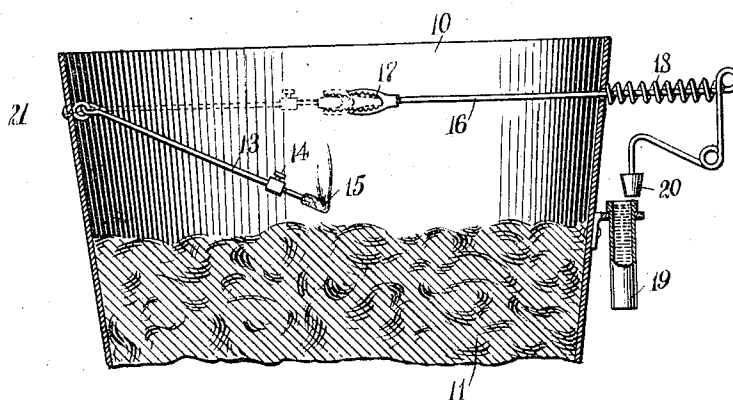


Fig. 2.



WITNESSES

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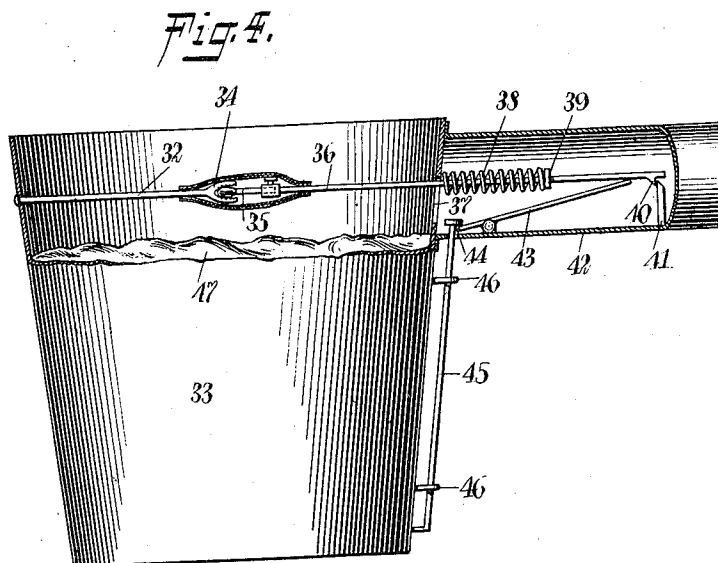
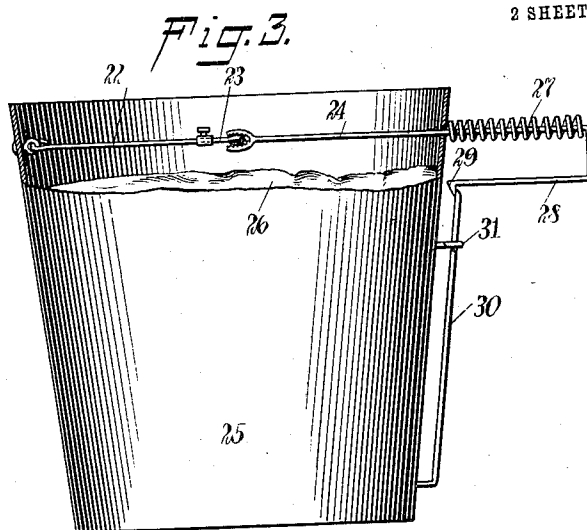
ATTORNEYS

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WITNESSES

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UNITED STATES PATENT OFFICE

FRANK THOMAS, OF SAN FRANCISCO, CALIFORNIA.

IGNITER.

1,046,898.

Specification of Letters Patent.

Patented Dec. 10, 1912.

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To all whom it may concern:

Be it known that I, FRANK THOMAS, a citizen of the United States, and a resident of San Francisco, in the county of San Francisco and State of California, have invented a new and Improved Igniter, of which the following is a full, clear, and exact description.

An object of the invention is to provide an igniter for igniting various fluids and substances, and preferably adapted for use in igniting cans of fluids, under certain atmospheric conditions.

My device is particularly adaptable for use in protecting orchards, fields, crops, etc., from damage by frost. At the present time orchards are generally protected from frost by the use of mattings or by lighting fires at such times as the frost has set in. Lighted oil pots, coal baskets and like devices spread over the area to be protected have been employed to raise the temperature, but these means have proved impractical, in that a large amount of time is required to light the oil pots and the like.

In the use of my device I preferably employ a vessel provided with my igniter and whereby, when the atmosphere becomes frosty, the expansion of a fluid or contraction of a solid sensitive to cold, will ignite the oil or inflammable substance contained in the vessel. In this manner hundreds of fires can be started at almost the same instant, provided the atmospheric conditions are of such nature as to cause an expansion of the mentioned fluid or contraction of the solid.

The invention consists essentially of an igniting device and an actuating means for normally holding the igniting device in a dormant position, the actuating means being sensitive to atmospheric conditions, and being actuated on a fall in temperature of the surrounding atmosphere to ignite the igniting device and to thus set an inflammable material on fire.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a perspective view of my igniter applied to a vessel, and in which use is made of an inflammable fluid; Fig. 2 is a fragmentary longitudinal sectional view, showing a match ignited by the igniting rod

released from normal position by the expansible force of a fluid; Fig. 3 is a side elevation of the igniter with the vessel shown partly in section, use being made of a contractible solid; and Fig. 4 is a similar view of a modified form of the same.

Referring more particularly to Figs. 1 and 2, use is made of a suitable vessel 10 adapted to contain a combustible oil 11, or the like. Mounted to swing in the vessel 10 is a holder 12, consisting of a rod 13 provided with a socket 14 or the like, for holding a match 15 or similar means capable of being readily ignited. Mounted to slide on the vessel 10 is an igniting rod 16 provided at one end with a roughened or serrated head 17 adapted to normally engage the match 15, as shown in Fig. 1. The igniting rod extends exteriorly of the vessel and is bent to a shape similar to the letter Z, with a spring 18 disposed intermediate the Z-shaped portion and the side of the vessel 10. A receptacle 19, adapted to contain an expansible fluid, is secured to the vessel 10, and a stopper 20, integrally formed on an end of the igniting rod 16, is adapted to fit into the top open end of the receptacle.

When the temperature becomes low enough to freeze the fluid in the receptacle 19, the fluid will expand as it freezes, and thus force the stopper 20 upwardly and out of engagement with the receptacle 19. Assuming that the igniter is normally in the position shown in Fig. 1, when the stopper is disengaged from the receptacle 19, the action of the spring 18 will move the igniting rod out of engagement with the match 15, and the friction produced between the serrated head 17 and the match 15 will ignite the match, and the latter will ignite the combustible material, as indicated in Fig. 2. The rod 13 is preferably pivoted on an eye 21 attached to the vessel 10, and is normally held in inactive position, and when released by the igniting rod it swings downward in contact with the combustible material to ignite the same.

In the modified form shown in Fig. 3, the holder 22 carrying a match 23, or the like, is engaged by the head 24 of the igniting rod 25 mounted to slide in the wall of the vessel 26 containing the combustible material. The outer end of the igniting rod 25 is pressed on by a spring 27 and is formed into an angular arm 28 terminating in a head 29 engaged by the upper end of a me-

tallic releasing bar 30, secured at its other end to the vessel 26. The releasing bar 30 slides in a guide 31 attached to the vessel 26. The spring 27 is under tension at the time the head 29 engages the releasing bar 30, and when the temperature of the surrounding atmosphere falls the releasing bar 30 contracts and the upper end of the said bar 30 moves out of engagement with the head 29, whereby the igniting rod 25 is released and moved outward by the tension of the spring 27. When this takes place the head 24 ignites the match 23 and the inflammable material 26 is ignited.

In the modified form shown in Fig. 4, the igniting rod 32 is fixed in the vessel 33 and its head 34 engages a match 35, removably secured to the holder 36, extending through a slot 37 in the sides of the vessel 33. A spring 38 is coiled on the holder 36 and rests with one end on the vessel 33, while the other end abuts against a collar 39 on the holder 36. The holder 36 is provided near its outer end with a shoulder 40 engaged by a post 41 attached to a tube 42 secured to the side of the vessel 33. A trip lever 43 is fulcrumed in the tube 42 and presses with one end on the holder 36 while the other end is engaged by the head 44 held on the upper end of a metallic bar 45 attached at its lower end to the vessel 33. The bar 45 is guided in guides 46 attached to the vessel. Normally the spring 38 is under tension and outward movement of the holder 35 is prevented by the shoulder 40 engaging the post 41. On a fall in temperature of the surrounding atmosphere the bar 45 is contracted and its head 44 imparts a swinging motion to the trip lever 43 which lifts the holder 36 so that the shoulder 40 moves out of engagement with the post 41, and the spring 38 now moves the holder 36 outward and with it the match 35, whereby the latter is drawn out of the head 34 and is ignited to ignite the inflammable material 47 in the vessel 33.

Although I have shown and described a match as the means for igniting the inflammable material, it is evident that any equivalent igniting means may be employed for the purpose. The match or like igniting means is protected against moisture preferably by a wrapper or coating of a water-proof material as shown at 60 in Fig. 4.

It will be seen that if numerous devices, such as described, are placed in an orchard or the like, the contents of each vessel will be ignited almost simultaneously when the temperature has reached a degree of coldness capable of influencing the actuating means for the igniting device.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. The combination of a vessel adapted to

contain a suitable fluid, a holder adapted to support a match, the holder being movably mounted adjacent the fluid, another member movably relatively to the first one, and having the end portion thereof adapted for engagement with the match, together with means for maintaining the holder and the member in such engagement with the match, and other means actuated by a fall in temperature whereby the first means is released.

2. The combination of a vessel adapted to contain a suitable fluid, a holder comprising a rod adapted to carry a match, an igniting rod adapted for engagement with one end of the match, means for maintaining the holder with the match therein in engagement with the said rod, and other means actuated by a fall in temperature and comprising a vessel having a suitable fluid therein for releasing the first means whereby the holder with the match therein will move relatively to the igniting rod, the match being ignited, thereby igniting the fluid.

3. The combination of a vessel adapted to contain a suitable fluid, a holder adapted to carry a match at one end thereof, the member being movably supported, an igniting rod slidably supported adjacent the fluid, the said rod being adapted for engagement with the match, means for moving the rod relatively to the holder, and other means for holding the parts against such movement, the last-mentioned means being operable through the fall in temperature in order to permit the first means to operate.

4. The combination of a vessel adapted to contain a suitable fluid, a rod pivoted to the vessel and adapted to carry a match at one end thereof, an igniting rod movably supported on the vessel, the said rod having a serrated head adapted for engagement with the match, a spring carried on the said rod and engaging the vessel whereby the rods are moved relatively to each other, and other means embodying a receptacle containing an expansible fluid, and being provided with a stopper in operative engagement with the second rod for holding the rods against such movement, the expansion of the fluid by a fall in temperature carrying the stopper out of the receptacle and permitting the spring to move the rods whereby the match is ignited and the fluid within the vessel is set on fire.

5. The combination of a rod having a match at one end thereof, a support for the rod, an igniting rod having one end thereof in engagement with the said match, a support for the igniting rod, resilient means carried by the rod and in engagement with the said support whereby the rods may be moved relatively to each other in order to ignite the match by friction, a receptacle containing an expansible fluid, a stopper in the receptacle, the stopper being in engage-

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ment with the igniting rod whereby it is held in engagement with the match, a fall in temperature causing the fluid to expel the stopper from the receptacle whereby the spring may move the igniting rod relatively to the first rod.

6. An igniter, comprising a holder adapted to retain an igniting device, a spring-controlled serrated igniting rod adapted to normally engage the device, a receptacle for containing an expansible liquid, and means on the igniting rod and adapted to releasably engage the receptacle to disengage the igniting rod with the igniting device when the said means is released from the receptacle by the expansion of the said liquid.

7. An igniter, comprising a holder adapted to retain a match, an igniting rod normally engaging the match, a receptacle for containing an expansible fluid, and a stopper releasably engaging the receptacle to disengage the igniting rod with the match when the said stopper is released from the said receptacle due to the expansion of the said fluid.

8. In combination with a liquid-containing vessel, a holder mounted to swing on the vessel and adapted to retain a match, an igniting rod mounted to slide on the vessel, a serrated head on the igniting rod for normally gripping the match, a spring for actuating the said igniting rod, a receptacle mounted on the vessel and adapted to

contain an expansible fluid, and a stopper integrally formed on the igniting rod and releasably engaging the receptacle, the said igniting rod being disengaged from the said match when the said stopper is released from the said receptacle, due to the expansion of the said fluid.

9. An automatic fire-starter comprising fire-lighting mechanism, a receptacle filled with water, and a member actuated by the expansion of the water for starting said mechanism.

10. An automatic fire starter comprising fire-lighting mechanism, a receptacle filled with a liquid which expands on a fall of temperature near the freezing point, and a member actuated by the expansion of the said liquid for starting said mechanism.

11. An automatic fire starter comprising means adapted to hold a match, a movable member adapted to engage the striking end of the match, a receptacle filled with an expansible liquid, and means actuated by the expansion of the liquid for starting said mechanism.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK THOMAS.

Witnesses:

E. W. BUDD,

EDITH W. BURNHAM.