June 19, 1923.

1,459,076

W. C. SCHEU

ORCHARD HEATER

Filed June 10, 1920

Fig. 1.

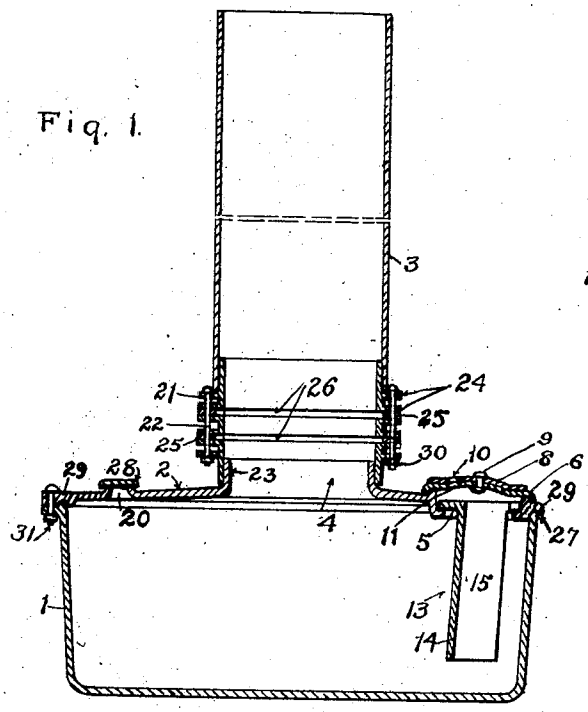


Fig. 3.

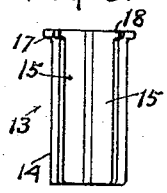


Fig. 4.

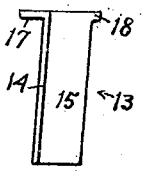


Fig. 2.

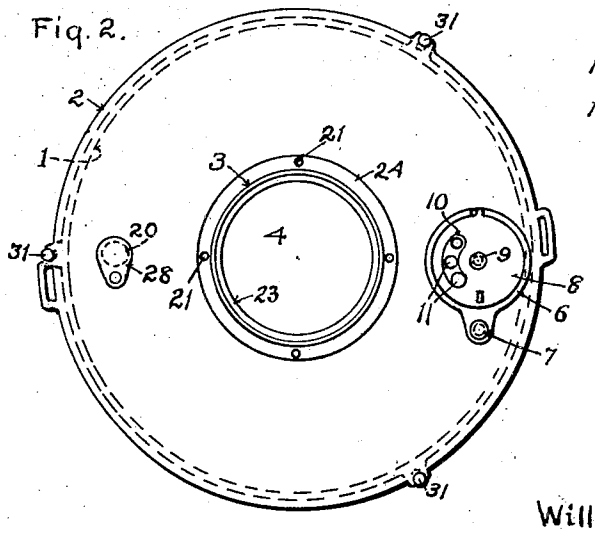
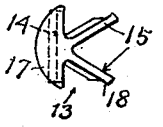


Fig. 5.



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Patented June 19, 1923. 1,459,076

UNITED STATES PATENT OFFICE.

WILLIAM C. SCHEU, OF LOS ANGELES, CALIFORNIA.

ORCHARD HEATER.

Application filed June 10, 1920. Serial No. 387,890.

To all whom it may concern:

Be it known that I, WILLIAM C. SCHEU, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Orchard Heater, of which the following is a specification.

This invention relates to an orchard heater for preventing frost danger in orchards, and the main object of the invention is to provide a method and device for this purpose which will effect substantially complete consumption of the fuel, and maximum development of heat.

In the construction and operation of orchard heaters it is a desideratum that means be provided for certainly and surely maintaining a fire in each heater in an orchard during the period of low or lowering temperatures when heaters are required to protect and save the blossoms and fruit from frost damage.

At times temperatures fall so low that it becomes necessary to operate the heaters at their maximum capacity of heat production, to keep the temperature surrounding the trees, high enough to protect them from damage.

It is also desirable to use heaters that do not produce a perceptible smoke, in other words the fuel should practically all be consumed, and in order to accomplish this result a very hot and vigorous fire is necessary.

The air supply to these heaters to produce and maintain the type of combustion necessary to carry a practically smokeless fire is admitted to the oil receptacle through an opening in the cover, usually at one side of the central stack, and the amount required for the grade of fuel being consumed is controlled and regulated by means of movable slides or covers such as are shown herein and in my Patents 1,089,013 and 1,148,803; the present invention being an improvement on the orchard heaters shown, described and claimed therein.

Where the maximum heat is required and the fuel has burned low in the receptacle and an increasing amount of air becomes necessary to maintain a large gas generating body of fire in the gradually enlarging generating space caused by the falling level of the oil in the receptacle, the strong draft from the stack sometimes lifts the fire off the surface of the oil and immediately checks the rapid generation of gas necessary to properly maintain the fire and this in turn renders the mixture too lean for perfect combustion and the fire pulls away from the air opening. This cooling of the surface of the oil by having the fire withdrawn therefrom adds further to the checking of the generation of gas, and as a consequence the fire finally pulls up into the stack and burns there as long as a proper mixture of gas and air is maintained, when it will either go out or fire back to the surface of the oil and ignite the vapors coming from the hot oil, where it will burn for a short time and finally again pull up into the stack and finally go out completely. This is particularly true in an orchard heater such as that shown in my Patent 1,089,013.

An object of this invention is to eliminate this trouble by incorporating in the air inlet opening an obstruction or deflector, so that the incoming air is retarded or obstructed, just sufficiently from a straight path to the stack, to permit a combustive mixture to take place right at the air opening. This results in a body of fire hovering directly in the air inlet opening and acting to always maintain a proper fire in the receptacle as long as any fuel remains.

This obstruction or deflector is just sufficient to prevent the fire pulling away from the air opening under the conditions I have described, so that an intense fire can be maintained until the last of the fuel is consumed.

Under many conditions of operation, and with certain grades of oil, a deflector or obstruction in the air inlet opening is unnecessary and a heater such as is shown in my Patent 1,089,013 burns vigorously and gives entirely satisfactory results without the use of a deflector. But since these heaters are gradually reaching the remote orchards that are not always located where a uniform grade of fuel oil is obtainable and varying grades of oil must be burned, then is where this invention enables the simple heater and the remote orchardist to get improved results, and as it is not possible to foresee the grades of fuel that may have to be burned in any lot of heaters, I have found it advisable to equip all heaters with this device.

The accompanying drawings illustrate an embodiment of my invention, and referring thereto:

Fig. 1 is a vertical section of the heater;

Fig. 2 is a plan view thereof;

Fig. 3 is a side elevation of an air deflector used in the heater;

Fig. 4 is an elevation of said deflector taken at right angles to Fig. 3;

Fig. 5 is a plan view of said deflector.

The heater comprises a pot or bowl 1 serving as a receptacle for the fuel to be burned, a cover or top 2 for such pot and a stack 3 centrally mounted on said cover and communicating with the interior of the pot by an opening 4 in said cover. The cover 2 is provided with an air inlet or opening 5 at one side of the central opening 4 and having a closure means 6 pivoted to the cover at 7 to enable it to be swung into position over said opening 5, or to be swung away from the opening to permit access to the interior of the pot. A damper 8 is centrally pivoted at 9 on this closure means 6 and has an opening 10, which may be brought in register with one or more of several openings 11 of graduated size in said closure means to regulate the amount of air admitted.

A deflector 13 extends adjacent to opening 5, being preferably formed as a casting having vertically extending ribs 14 and 15 extending downwardly from said opening so as to deflect, obstruct and retard the passage of the air and flame from a direct line to the stack and thus prevent the draft from the stack pulling the fire off the surface of the oil and away from the air opening, which has a tendency to smother the fire by interfering with the generation of sufficient gas to maintain the quantity and intensity of fire necessary to keep up proper functioning of the heater, the tendency of the deflector being to concentrate an intense and vigorous fire at and around the air opening, the rib 14, or deflector member, extending transversely to a radial direction, and the ribs 15 extending divergently from the middle portion of rib 14. Lugs or flanges 17 and 18 are provided at the tops of ribs 14 and 15 to rest on a flange 19 extending around the opening 5 so as to support the deflector. The shape of this deflector is important and after many exhaustive and varied experiments I have decided on the shape and construction shown in the drawings herewith.

I have found it desirable that a part at least of the air inlet opening should have no obstruction of any kind extending from this free opening to the surface of the oil or outward from the opening.

This result I have accomplished through the structure disclosed, where, by making a deflector of irregular or undulating contour the entering air is just sufficiently retarded to prevent the draft pulling the fire up the stack, still it has free passage to mix with the gases in the receptacle at the opening, and thus I practically eliminate the deposits of carbon and residue so prevalent with heaters generally having tubes and other devices at the air inlet opening.

An air inlet opening 20 is provided in the cover 2 on the side opposite the air inlet 5 to furnish additional air to aid in forming a completely combustible mixture, said air inlet opening being controlled by a valve or closure means 28.

Inlet means are also provided at the lower end of stack 3 to furnish the additional air required for combustion, said inlet means preferably comprising a plurality of rings or annular members 21 secured together by bolts 22, the lower ring resting on flange 23 extending around the opening 4 in the cover, said rings 21 being spaced apart by spacing washers or members 25 so as to form air inlet slots 26 between said rings. Said spacing washers 25 are secured in position preferably by the same bolts 22 that hold the rings 21 in position, said bolts passing through said washers and through flanges 24 on said rings and being fastened by nuts 30.

The operation is as follows:

A suitable amount of fuel being placed in the pot 1, the cover 2 is applied to the pot and the joint between same preferably made air tight by suitable cement or luting, indicated at 29, placed in the joint between the upper edge or rim of the pot and annular flanges 27 on the bottom of the cover. The fuel is ignited in any suitable manner and the air inlet damper 8 is opened sufficiently to admit enough air to provide for partial combustion of the fuel adjacent to the air inlet in such manner as to generate by such partial combustion a gas or vapor which partially fills the interior of the pot and is mixed with additional air furnished through the opening 20, the amount of such additional air being controlled by means of the valve or closure means 28. This additional air mixing with the vapor produced by partial combustion adjacent the air inlet forms a mixture which burns in the stack by combustion with the air furnished through the air inlet slots 26.

In the above described operation the function of the deflector means 13 is to confine the primary combustion adjacent to the air inlet opening so as to produce a flame of limited extent sufficiently strong to generate the requisite amount of combustible vapor by the resulting heating action on the fuel, the ribs 14 and 15 directing the incoming air directly down on the fuel so as to confine this primary combustion to a limited zone adjacent to the deflector.

What I claim is:

1. In an orchard heater a fuel receptacle, a cover mounted thereon and having an outlet stack and an air inlet opening, a deflector member at said opening and having ribs

extending downwardly into the fuel receptacle, said ribs extending divergently so as to form vertical channels for receiving the air entering at said inlet opening, and acting as an obstruction to maintain a flame at the air inlet opening and prevent the draft from pulling it directly to the stack.

2. A construction, as set forth in claim 1, and comprising, in addition, damper means at said inlet opening to control the supply of air thereto, and said cover having additional regulable air supply means therein.

3. An orchard heater comprising a fuel receptacle, a cover mounted thereon having an outlet stack and an air inlet opening, an obstructive member arranged at the said air inlet opening having an irregular undulating surface to divert and obstruct all of the air entering said air inlet opening from taking a direct path to said outlet stack whereby a fire is maintained at said air inlet opening.

4. A baffle for a heater embodying a body portion having a plurality of vertically extending ribs providing channels therebetween, and having a horizontally disposed supporting flange.

In testimony whereof I have hereunto subscribed my name this 2nd day of June, 1920.

WILLIAM C. SCHEU.