Nov. 8, 1927. 1,648,041

W. S. BUTTON

ORCHARD HEATER

Filed June 20, 1927

Fig. 1.

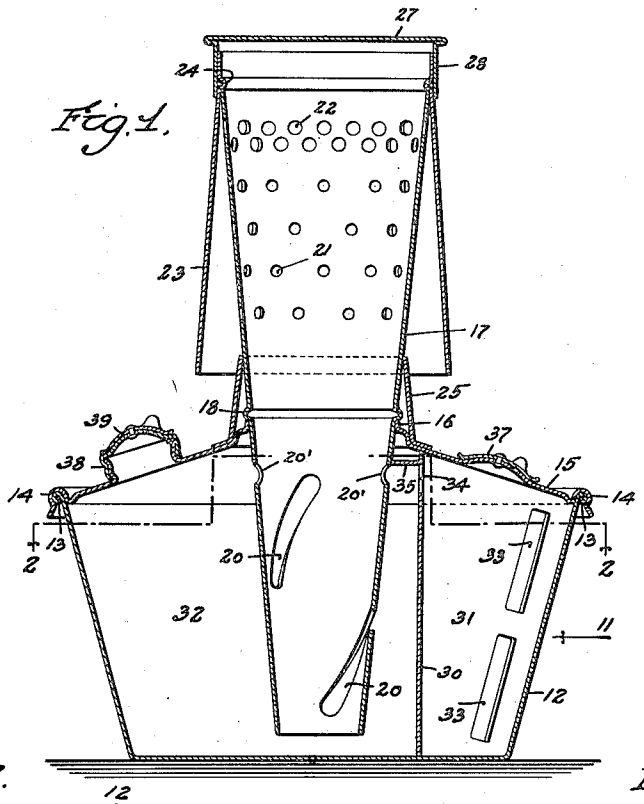


Fig. 2.

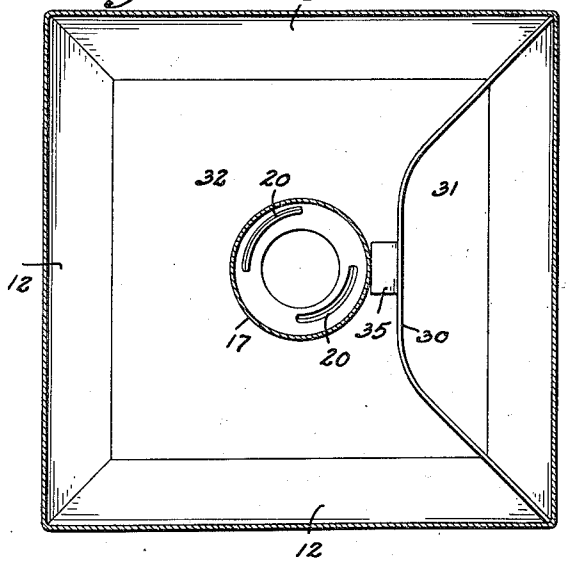
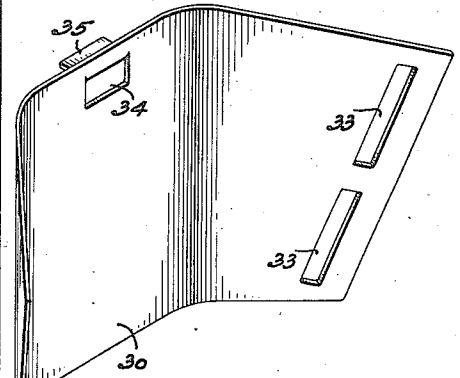


Fig. 3.



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WILLIAM S. BUTTON, OF RIVERSIDE, CALIFORNIA.

ORCHARD HEATER.

Application filed June 20, 1927. Serial No. 200,033.

My presnt invention relates to orchard heaters of the type in which liquid fuel, such as low grade petroleum oils, is used.

Common forms of such heaters now in use are objectionable, due to imperfect combustion methods employed which result first, in the production of large volumes of black smoke in such quantities as to become a nuisance in the surrounding territory and, second, in large fuel consumption.

It is the principal object of my invention to produce an orchard heater of the class described, of simple form and construction, having its parts so arranged as to produce the heat required with low fuel consumption and with a minimum amount of unburned products.

Other objects and advantages will appear herinafter in the following description.

Referring to the drawings which are for illustration purposes only—

Fig. 1 is a vertical sectional view of a heater embodying a form of my invention.

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

Fig. 3 is a perspective view of the baffle or division wall.

More particularly describing the details of construction of my heater, 11 designates a receptacle for the fuel oil, such receptacle being preferably rectangular in shape and having upwardly and outwardly tapered sides 12, terminating at their upper ends in a rolled edge 13, arranged to be engaged by a corresponding shaped edge 14 formed on a cover 15, such edge 14 of the cover snapping over the rolled edge 13 of the receptacle and firmly supporting the cover in place.

The cover 15 is pyramidal as to elevation and truncated, the truncation thereon forming a circular opening, the edges of which are turned upwardly to form a flange 16 which recives a stack 17. The stack 17 is tubular in form and preferably of the slightly conical truncated form, so that when inserted in the central opening in the cover 15, the stack will be supported in the flange 16 heretofore referred to. If desired, a bead 18 may be formed on the stack arranged to seat on the flange 16, thereby affording a further supporting means for the stack. The stack extends downwardly into the receptacle 11 and is provided in such lower extension with a plurality of inclined, elongated slots 20, providing open communication from the interior of the receptacle to the stack regardless of the level of the oil in the receptacle.

The stack above the cover 15 is provided with a series of fine perforations 21 preferably arranged in rows, and above such fine perforations is arranged a series of larger perforations 22, preferably arranged in close relationship, the fine perforations being for the purpose of admitting air in small quantities to the stack and the larger perforations admitting an increased amount of air adjacent the outlet opening or top of the stack.

23 designates a shield, frusto conical in shape and provided with a bead 24 which rests upon the top of the stack, forming a support for the shield. The shield 23 extends downwardly a sufficient distance to cover all the perforations in the stack, thereby protecting the same against entrance of rain into the stack through such perforations and at the same time forming an air heating chamber about the stack whereby the air entering the stack through the perforations therein is heated.

To protect against rain entering the receptacle about the joint between the cover and the stack, and for the additional purpose of affording additional supporting or steadying means for the stack, I provide a circular collar 25 which rests on a shoulder 26 formed on the top 15, extending upwardly and inwardly therefrom in tapered form to engagement about the stack at the upper end of the collar which is preferably above the lower edge of the shield 23 as shown.

A cap 27 is provided for the stack which is formed with a downwardly depending flange 28, which fits over the upper end of the shield 23, such cap 27 protecting against rain entering the upper end of the stack and also serving as a flame extinguisher for the heater.

In the receptacle 11 I provide a division wall or baffle 30 which divides the receptacle into a combustion chamber 31 and oil reservoir 32. This division wall 30 is formed of a single piece of sheet metal shaped at its edges to conform to the cover, side walls and bottom of the receptacle and extending from two adjacent corners of the receptacle inwardly with its mid-section adjacent the depending portion of the stack. The wall 30 is provided with vertically extending elongated openings 33, providing open communication between the combustion chamber and oil reservoir, and is also provided in its

mid-section near the top with an opening 34, the metal from such opening 34 being bent outwardly therefrom in position to engage the stack and form a stay or brace for such wall.

Draft means for admitting air to the combustion chamber are provided which, in the form shown, consists of a damper 37, and filling means are provided for the oil reservoir which consists of a screw cap 38, which cap may also be provided with a damper 39 for the purpose of admitting air to the oil reservoir.

The operation of my orchard heater is as follows: oil having been placed in the receptacle and the cap 27 having been removed, the oil is ignited through the damper 37. The ignition takes place initially in the combustion chamber, but the flame therefrom passes through the opening 34 through any adjacent slot 20 or opening 20', into the stack and upwardly therein. When once started and by proper regulation of the draft damper 37, the flame discontinues its continuous extension from the combustion chamber to the top of the stack and is confined to the combustion chamber where unburned combustible gases are formed from the heated oil, which gases enter the stack but, due to lack of proper amounts of air until the large perforations 22 are reached, no ignition takes place until the upper part of the stack is reached, where the gases burn, thereby producing comparatively complete combustion without the production of undesirable smoke.

By dividing the receptacle into a fuel chamber and a combustion chamber, operating as above described, I find that the heater operates nearly twice as long as when the whole body of oil is permitted to be ignited.

What I claim is:

1. An orchard heater comprising a receptacle, a cover for said receptacle, a stack extending through said cover, said stack having openings therein above and below said cover, a division wall in said receptacle forming an oil reservoir into which said stack extends and a combustion chamber, said division wall having openings therein, and draft means for supplying air to said combustion chamber.

2. An orchard heater comprising a receptacle, a cover for said receptacle, a stack extending through said cover, said stack having openings therein above and below said cover, a division wall in said receptacle forming an oil reservoir into which said stack extends and a combustion chamber,— said division wall having an opening in its mid-section at the top thereof and a vertically extending elongated opening therein.

3. An orchard heater comprising a receptacle, a cover for said receptacle, a stack extending through said cover, said stack having openings therein above and below said cover, a division wall in said receptacle forming an oil reservoir into which said stack extends and a combustion chamber, said division wall having openings therein, draft means for supplying air to said combustion chamber, and filling means for said oil reservoir having adjustable air openings therein.

4. An orchard heater comprising a receptacle, a cover for said receptacle, a stack extending through said cover, said stack having openings therein above and below said cover, a division wall in said receptacle forming an oil reservoir into which said stack extends and a combustion chamber, said division wall having openings therein, and draft means for supplying air to said combustion chamber,—said openings in said stack consisting of perforations therein above said receptacle cover and elongated openings therein below said cover.

5. An orchard heater comprising a receptacle, a cover for said receptacle, a stack extending through said cover, said stack having openings therein above and below said cover, a division wall in said receptacle forming an oil reservoir into which said stack extends and a combustion chamber, said division wall having openings therein, and draft means for supplying air to said combustion chamber,— said openings in said stack consisting of perforations therein above said receptacle cover and elongated openings therein below said cover, and a shield for said stack consisting of a tubular frusto conical member, extending downwardly over said stack to a point below the perforations therein, and a bead formed on said shield seated on the upper end of said stack.

6. An orchard heater comprising a receptacle, a cover for said receptacle, a stack extending through said cover, said stack having openings therein above and below said cover, a division wall in said receptacle forming an oil reservoir into which said stack extends and a combustion chamber, said division wall having openings therein, and draft means for supplying air to said combustion chamber,—said openings in said stack consisting of perforations therein above said receptacle cover and elongated openings therein below said cover, and a shield for said stack consisting of a tubular frusto conical member, extending downwardly over said stack to a point below the perforations therein, a bead formed on said shield seated on the upper end of said stack, and a collar seated on said cover about the stack extending upwardly thereover to a point above the lower edge of said shield.

7. An orchard heater comprising, a receptacle, a cover for said receptacle having a stack opening therein, a stack in said open-

ing extending downwardly into said receptacle and having openings therein above and below the cover, draft means on said cover, a shield on said stack extending downwardly thereover and having its lower edge spaced apart from said stack, and a collar seated on said cover extending upwardly and inwardly into engagement with said stack to a point adjacent the lower edge of said shield.

8. An orchard heater comprising a receptacle, a cover for said receptacle, a stack extending through said cover, said stack having openings therein above and below said cover, a division wall in said receptacle forming an oil reservoir into which said stack extends and a combustion chamber, said division wall having openings therein, and draft means for supplying air to said combustion chamber, said division wall being formed of a bent sheet metal having its ends extending into adjacent corners of said receptacle, and brace means between the mid-section of said wall and said stack.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 15th day of June, 1927.

WILLIAM S. BUTTON.