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ORCHARD HEATER

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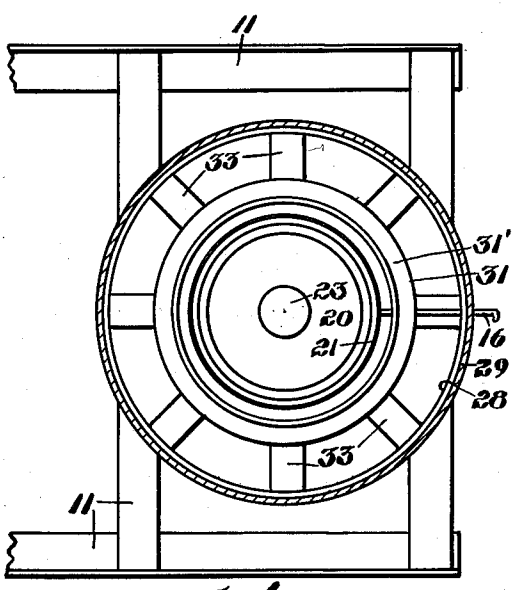


Fig. 2

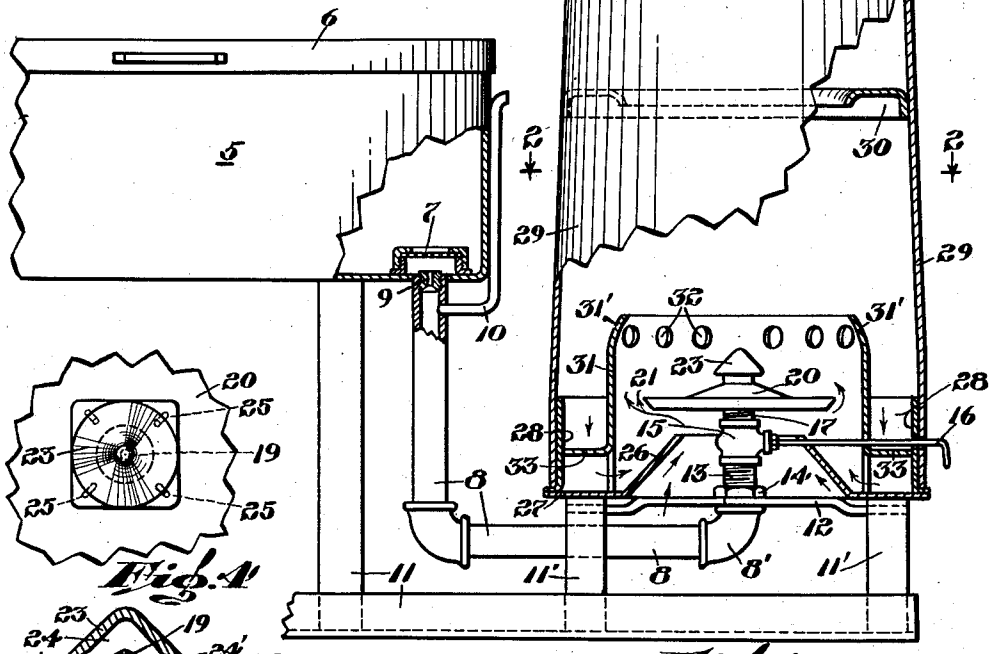


Fig. 1

Fig. 4

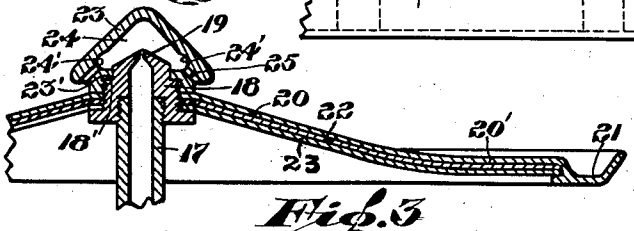


Fig. 3

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ORCHARD HEATER

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4 Claims. (Cl. 158—91)

My invention relates to orchard heaters of the character used in orchards and other out-of-door locations for the purpose of preventing frost or damaging low temperatures within certain areas and it is distinguished from the so-called "smudge pots" in that it depends upon the development of heat within the surrounding area rather than upon smoke, smudge or the like.

The principal object of my invention is to provide a heater which will develop a maximum amount of heat, with a minimum or no smoke, from a cheap fuel.

Among the other objects of my invention are to provide in a heater of the character referred to an improved fuel feed and combustion, with control means for the inflow of air, whereby to best promote perfect combustion for the development of heat without smoke; to provide an improved combustion pan upon which the fuel is discharged and an improved shelter drum around said combustion pan, with means for directing the upflow of air from beneath said heater around the edge of said combustion pan.

In order to explain my invention more in detail, I have shown a practical embodiment thereof on the accompanying sheet of drawings, which I will now describe.

Figure 1 is a side elevation of an orchard heater embodying my invention, with certain parts or portions broken away and shown in section to show the construction and arrangement thereof;

Figure 2 is a view looking down into the heater on section line 2—2 of Fig. 1;

Figure 3 is an enlarged vertical sectional view through the combustion pan and the fuel feed cap or nozzle; and

Figure 4 is a plan view looking down on the fuel feed cap or nozzle.

Referring now in detail to the drawing, I will describe my invention as shown for illustrative purposes on the drawing, following the course of the fuel as I describe the various parts and their association and operation.

The fuel is placed in any suitable tank or reservoir, 5, with removable cover 6, with screen covered outlet, as at 7, connected with a pipe 8, leading to the underside of the heater proper. At the juncture of the pipe 8 with the reservoir 5, I have shown an apertured plug 9, and also a vent pipe 10, extending from said pipe 8 up along side of the reservoir.

The entire structure is shown mounted upon a supporting frame 11, which can be made of any suitable material, preferably angle irons secured together, substantially as shown, said supporting frame being of rectangular form and being movable bodily from place to place, as may be desired.

Across upright portions, 11', 11', of said frame is a cross bar 12, through which the end of the supply pipe 8, connects with the burner mechanism. An elbow 8', bears against the underside of said bar 12, with a threaded nipple 13 and lock nut 14, connecting said elbow 8' with said bar. A needle valve 15 is connected with the nipple 13, said valve having an operating rod 16 extended out to the outside of the frame structure for manual operation, as clearly illustrated. Connected with the upper end of said valve 15 is another threaded nipple or pipe 17, seen in Fig. 3, upon the upper end of which is mounted my new and improved fuel discharge cap or nozzle 18, clearly shown in section in said Fig. 3, with the annular shoulders 18' and the threaded portion therebetween, said nozzle portion 18, terminating in a conical end with discharge aperture 19 therein.

Placed down over said nozzle member 18, is a combustion pan 20, which has a central opening therein to fit over said nozzle and rest down on the lower annular shoulder 18', as clearly shown, said combustion pan being in the form shown, that is, of slightly conical form in its middle portion, with an annular horizontal portion 20' and terminating around its outer edge in an annular trough-like border, designated 21. Said combustion pan is also shown with an under lining of asbestus 22, or other suitable material, with a thin meal sheet 23 thereunder. This prevents cooling said combustion pan on the under side by the upflowing cool air, hereinafter referred to.

Mounted upon said nozzle member 18, and fitting down upon said pan 20, is a cap-like member 23, of conical form, with a square base, and internally threaded to screw down tight upon said nozzle member 18, and with an inner annular shoulder 23' which seats down upon the upper annular shoulder 18' of said nozzle member 18, as seen in Fig. 3. Thus said combustion pan 20, and its under lining, is tightly clamped around said nozzle member 18, with the cap-like member 23.

The interior of said cap-like member 23 is formed into a conical expansion chamber 24, the lower portion of which is enlarged, as at 24', with four discharge apertures, as 25, 25, therefrom and opening out under the overhanging corners of said cap-like member 23, as will be understood from the showing made. These overhanging corner portions protect said outflow apertures 25, from under which said apertures discharge the expanded fuel down upon the conical portion of the com-

bustion pan, upon which it flows in a thin film to the horizontal portion 20' thereof, and thence into the trough portion 21, the combustion taking place upon the top of the pan as said fuel flows gradually and slowly downwardly over the pan. Said cap 23 is heated sufficiently to expand the fuel oil but not hot enough to cause it to coke and in this heated and expanded condition it is in good condition for combustion upon the pan 20.

Around the control valve 15, under the combustion pan 20, is mounted a conical shaped air inlet member 26, its flat annular base portion 27, resting upon the frame members, 11', 11', and being provided with an upstanding annular portion 28, forming a holding member for a stack 29, which fits down over said member 28, as clearly shown in Fig. 1. Within said stack is provided an annular, overhanging baffle member 30, substantially as shown.

As further means for controlling the air flow around said combustion pan 20 and burner, I have provided a drum 31, having its upper edge turned inwardly, at 31' and provided with a series of holes 32, substantially as shown. The lower edge of said drum is provided with a series of struck-out lips or tongues, as 33, bent outwardly to a horizontal position, as shown, whereby to space and center said drum within the member 28, and at the same time provide openings through the lower edge of said drum at said struck-up lips, thus making it possible for cooler air in the lower end of the stack, and in the member 28, to be sucked or caused to move through said openings, under said horizontal lips 33, and upwardly around the outer edge of the combustion pan by the inflow and upflow current set up through the conical member 26 and upwardly within the drum 31. It will be understood that the air from under the heater is caused to flow upwardly through the conical member 26, and thence around the outer edge of the pan 20 and upwardly within the drum 31, the inturned upper edge of said drum causing said air to assume a slight intermingling action as it mixes with the fumes of the fuel over the combustion pan 20, and causing a more perfect combustion of said fuel upon and immediately above said pan 20.

The upper end of the stack 29 is provided with a removable cover 34 to prevent rain and dirt from falling into said stack when not in use.

An important feature of my invention is the provision of the fuel expansion chamber 24, in the cap 23, with the discharge apertures 25 therefrom. As the fuel is discharged from the nozzle aperture 19 into said expansion chamber, the heat causes it to expand and it is then discharged through said apertures on to the combustion pan for combustion and no matter whether the structure has been tilted or not, said fuel is forced out of all of said apertures on to the combustion pan at all sides of the cap and the combustion takes place thereon. It is known that rain and other causes sometimes slightly tilts said heater structures from the true vertical or upright position and this fuel feed is important for the best results.

Thus I have provided a simple, practical and economical orchard heater which produces a maximum amount of heat with no smoke and one which will burn the cheaper fuel successfully, and while I have shown and described one practical embodiment of my invention, I am aware that changes in the details of construction and arrangement can be made therein without departing from the spirit thereof, and I do not, therefore, limit the invention to the showing made, except as I may be limited by the hereto appended claims.

I claim:

1. A heater comprising a circular base having a central, upwardly projecting frusto-conical portion defining an air passage, an outer casing mounted on said base, a cylindrical member on said base surrounding said frusto-conical portion and having spaced portions of its lower edge struck-up to provide openings and to form outwardly extending horizontal spacing members centering said cylindrical member within the casing, a fuel pipe extending upwardly through said passage, and a burner mounted on said pipe within said member and having a horizontally extending portion overlying said passage whereby the air issuing therefrom is directed outwardly toward the cylindrical member.

2. A heater comprising a base member having a central, upwardly projecting frusto-conical portion defining an air passage, an outer casing mounted on said base and extending upwardly as a stack, a cylindrical member on said base, surrounding said frusto-conical portion with its upper edge turned inwardly and having spaced portions of its lower edge struck-up to provide openings and to form outwardly extending spacing members for centering said cylindrical member within said casing, a fuel pipe extending upwardly through said air passage, a burner mounted on said pipe within said member and having a horizontally extending portion overlying said passage whereby air issuing therefrom is directed outwardly toward the cylindrical member and thence upwardly and inwardly over said burner.

3. A heater including a base, a stack mounted thereon, a cylindrical member mounted on said base and spaced inwardly from said stack, whereby to provide an annular space between said member and said stack, a frusto-conical member within said cylindrical member and forming an air passage upwardly therethrough, said cylindrical member having openings through its lower edge forming communication between said annular space and said cylindrical member, a fuel pipe extended up through said passage, and a burner mounted on said pipe within said cylindrical member, said burner having a combustion pan overlying said passage, whereby air passing upwardly through said passage is directed outwardly and upwardly around the outer edge of said combustion pan.

4. A heater including a base, a stack mounted thereon, a cylindrical member mounted within said stack on said base and forming an annular space between said stack and said cylindrical member, said cylindrical member having air inlet openings through its side from said annular space, means forming an air passage upwardly into said cylindrical member, said cylindrical member being fully open at its upper end, a fuel pipe extended up through said air passage into said cylindrical member, a burner on said pipe and overlying said air passage, whereby air passing upwardly is directed outwardly and upwardly around the burner, the part of said burner overlying said passage constituting a conical combustion pan and said burner having a pressure feed nozzle discharging said fuel downwardly upon said pan, substantially as shown.

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