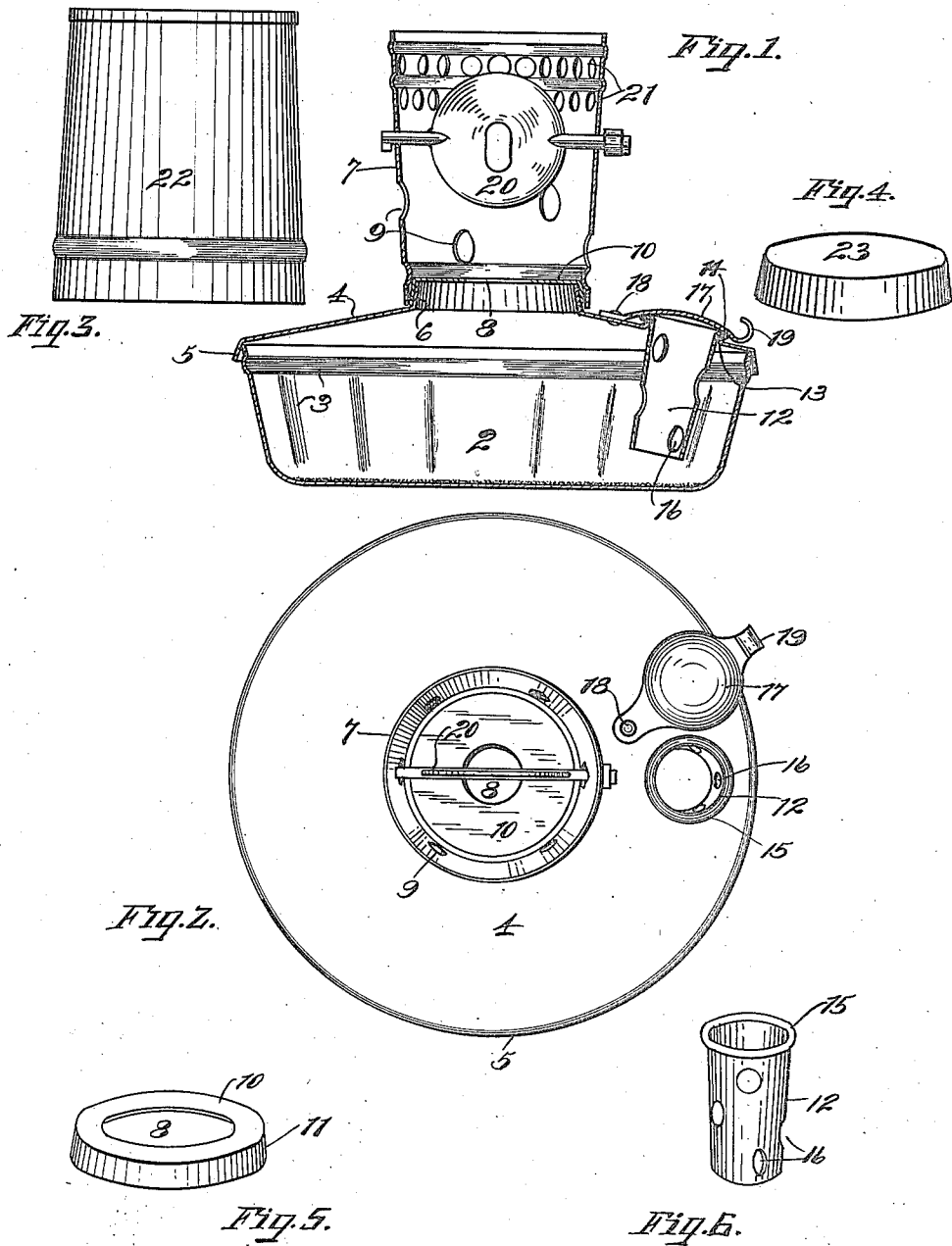


E. W. DUNN.
ORCHARD HEATER.
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1,063,422.

Patented June 3, 1913.



WITNESSES:

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ORCHARD-HEATER.

1,063,422.

Specification of Letters Patent.

Patented June 3, 1913.

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To all whom it may concern:

Be it known that I, EMANUEL W. DUNN, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented new and useful Improvements in Orchard-Heaters, of which the following is a specification.

This invention relates to orchard heaters and particularly to an orchard heater for use in generating and burning gases from liquid fuels of different qualities and natures.

There are many qualities of liquid fuels on the market and it is the object of the present invention to evolve, design and provide an orchard heater particularly adaptable for the efficient combustion of liquid fuels commercially common.

I have found by practical experience that, owing to the great diversity of commercial liquid fuels, it is very desirable to design an orchard heater involving details of construction particularly with the function and object in view of most effectually generating and most perfectly burning gases from these various liquid fuels. In order to accomplish this perfect combustion of the divers fuels, it is necessary to provide an orchard heater having a vent or discharge aperture for the gases generated in the container, the size of the aperture being proportionate to the specific gravity and volatility of the oil.

A further feature of the invention is the provision of means whereby the rapidity of combustion of the liquid fuel can be readily controlled, and whereby the quantity of air may be varied in accordance with the variations in the different oils.

The invention consists of an orchard heater with means for admitting a quantity of air into the generating chamber of the heater as the oil recedes, and which has means whereby gases generated can be immediately mixed with an additional quantity of air or oxygen to produce perfect combustion.

It also comprises details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a central vertical section through the heater. Fig. 2 is a plan view of the same, showing the air regulator opened. Fig. 3 shows a cover by which the stack of the heater may be covered to keep out moisture. Fig. 4 is a view of a cover

which may be used on the heater when the stack is removed. Fig. 5 is a perspective view of one of the interchangeable vent collars. Fig. 6 is a perspective view of the air feeder or conductor.

My present orchard heater comprises a container 2, of suitable material, proportions and design, preferably being stamped or drawn from an integral piece of metal, the sides flaring so that a number of the containers may be closely nested for the conservation of space in storage or transit.

The wall of the container is ribbed, beaded or appropriately reinforced, as at 3, for the purpose of stiffening and strengthening. Over the container 2 there is adapted to be snugly circumferentially fitted an appropriate cover 4, preferably tapering so that many covers may be nested and for the purpose of acting as a water shed, the cover having an annular, downturned flange 5 closely engageable with the rim of the container 2 to make a tight joint therewith.

The upper portion of the cover 4 is provided with a collar or ring 6 which may be appropriately formed upon, or secured to, the cover and projects sufficiently above the same to form means for receiving and steadying a stack 7. The cover 4 is preferably provided with an aperture 8, the area of which is determined by the quality, nature or specific gravity of the liquid oil to be consumed in the heater; the area of the aperture 8 being less than the area of the adjacent portion of the stack 7 which is superposed on the cover 4 and which is provided with a series of air inlet openings 9 of suitable size and location.

While it is possible to provide covers 4 interchangeable on the container 2, each of the covers being provided with an aperture or vent 8 of a different size, so that the one container can be used for the purpose of reducing to gas and combusting the different grades of oils, I here show disks or removable parts 10, each with an opening 8 of different area, which parts are adapted to be positioned upon the collar 6 of the cover 4 for the efficient combustion of the particular oil to be consumed. The changeable vent members 10 are provided with flanges 11, designed to snugly fit the collar 6 of the cover 4; the lower part of the stack 7 being formed to embrace the flange 11 of a vent piece 10 when this is adjusted on the cover 4. Having provided a container especially

designed for the efficient combustion of different grades of oil, I further provide means for the accurate control of the rapidity of combustion of the gases generated in the container. This means consists in the present case of a conductor or tube 12, preferably made tapering in its length so that a plurality of the tubes may be compactly nested. The tubes or air-feeding conductors 12 are insertible through an aperture 13 formed in the cover 4; the rim of the aperture preferably being flanged or turned upwardly, as at 14, for the purpose of throwing off moisture which may accumulate on the inclined cover 4 and also for the purpose of forming a shoulder with which may snugly engage a down-turned collar or bead 15, formed at the larger end of the air feeder 12. Preferably the length of the feeder 12 is less than the distance from the cover to the bottom of the container so that it will not become embedded in the residue of the consumed oil.

The air feeder 12 is provided with a plurality of appropriately sized and located apertures 16 through which air entering the feeder at the top will pass outwardly over the oil in the container; the tube projecting downwardly toward the bottom of the container to insure the conveyance of a quantity of air to the level of the liquid as this approaches the bottom of the container. The volume of air admitted to the conductor or feeder 12 is nicely controlled for the regulating of the volume of gas generated in the container by means of a throttle or gate 17, here shown as a concavo-convex plate or disk, pivoted at 18 on the cover 4, and having a hook or ring 19 at one side into which may be inserted a wire or other device whereby the gate can be swung over the inlet opening of the feeder 12 while the heater is in use.

In operation, the container is charged with a quantity of oil, the quality or specific gravity of which is known to the orchardist, and he applies to the container a cover 4 having a gas vent 8, of the desired proportions, to correspond with the oil to be consumed. In the event that the oil is of high quality and is quickly volatilized, the cover 4 is used with a vent smaller than with a lower grade oil, so that the rapidity of the generation and combustion of the gas is controlled by the size of the escape vent 8 and the air-feeding device 12 with the gate 17. After the fuel has started to burn, a slight combustion of the gas will take place in the chamber formed below the cover 4. This combustion increases the temperature in the chamber sufficiently to evaporate or reduce the liquid fuel to a gas which will rise and pass through the opening in the top of the container, thereby enabling the gases generated to become immediately in

contact with additional air or oxygen in the stack adjacent to the opening to provide perfect combustion.

Suspended within the stack 7, above the vent 8 of the cover 4, is a plate, disk or other appropriate device 20, the function of which is to radiate heat during the operation of the heater which will materially aid in heating the gases in the stack and, therefore, further aid in their combustion. The stack is here shown as being perforated around its upper portion with a series of apertures 21 for the admission of air to fully complete combustion of the gases generated and burning in the stack.

I show in Fig. 3 a cover 22 of tapering form and of sufficient length to entirely cover the stack 7 of the heater, when adjusted thereover, for the prevention of the entrance of moisture into the container when the heater is not in use.

In Fig. 4 a smaller cover 23 is shown which may be applied over the aperture of the cover 4 after the stack 7 has been removed; the cover 23 being of less depth and consequently somewhat cheaper than the larger cover 22.

I find by placing a small layer of sand or other suitable material on the bottom of the container that the residue will not cling so much to the bottom and that it can be very easily dislodged by inverting and jarring the container.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. an orchard heater comprising a container for a liquid fuel, means for conveying air downwardly into said container as the surface of the oil recedes, a perforated combustion stack projecting upwardly from the container, and an opening in the top of the container of smaller area than the transverse area of the stack, thereby enabling the gases generated in the container when passing through the top of the container to become immediately in contact with additional air or oxygen necessary to provide perfect combustion.

2. An orchard heater comprising a container for a liquid fuel, a cover for the container forming a substantially closed generating chamber, a means for admitting air into the chamber over the surface of the liquid therein, said cover having an opening for the outlet of gases generated in the chamber, the size of the opening being determined by the quality of the liquid fuel, and a stack on the cover, the transverse area of which exceeds the area of the opening in the cover, said stack having apertures for the admission of air with which the gases from the opening are immediately intimately commingled for perfect combustion in the stack.

3. An orchard heater comprising a substantially closed gas generator containing a liquid fuel, having a gas vent, the area of which is in proportion to the specific gravity of the fuel liquid, and a stack on the container having apertures, said stack forming a chamber with an area in excess of the area of the gas vent, into which chamber the gas issues and is immediately mixed with a quantity of air sufficient to produce a perfect combustion.

4. An orchard heater having a container for a liquid fuel, a cover for the container forming therein a chamber for the generation of a combustible gas from the liquid, a stack projecting upwardly from the cover and having perforations for the admission of air to its interior, and means for admitting air into the generating chamber, said cover having an opening of less area than the transverse area of the stack through which the generated gases pass into the stack wherein they are mixed with oxygen and perfectly combusted.

5. An orchard heater comprising a container for a liquid fuel, a removable cover having a snug rim fit with the container and having interchangeable vent plates each with an opening of a size different from the others, a perforated stack adjustable on the cover into which gases from the container will enter through the opening in the plate on the cover, a removable device adjustable on the cover for conveying air into the container, and cover parts for said device and for the stack.

6. An orchard heater comprising a container for a liquid fuel, means for conveying air downwardly into the container as the surface of the oil recedes, a perforated combustion stack projecting upwardly from the container, and a cover over the container and having interchangeable parts each with an opening of smaller area than the transverse area of the stack, thereby enabling the gases generated in the container, when passing through the top of the container, to become immediately in contact with additional air or oxygen necessary to provide perfect combustion.

7. An orchard heater comprising a covered container for a liquid fuel, means for conveying a variable quantity of air into said container, a perforated combustion stack projecting upwardly from the container, interchangeable vent plates for the cover of the container each having an opening smaller than the transverse area of the stack, thereby enabling the gases generated in the container when passing through the top of the container to become immediately in contact with additional air or oxygen necessary to provide perfect combustion, and a heat radiator in the stack above the opening for absorbing and radiating heat.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

EMANUEL W. DUNN.

Witnesses:

JOHN H. HERRING,
W. W. HEALEY.