

April 9, 1935.

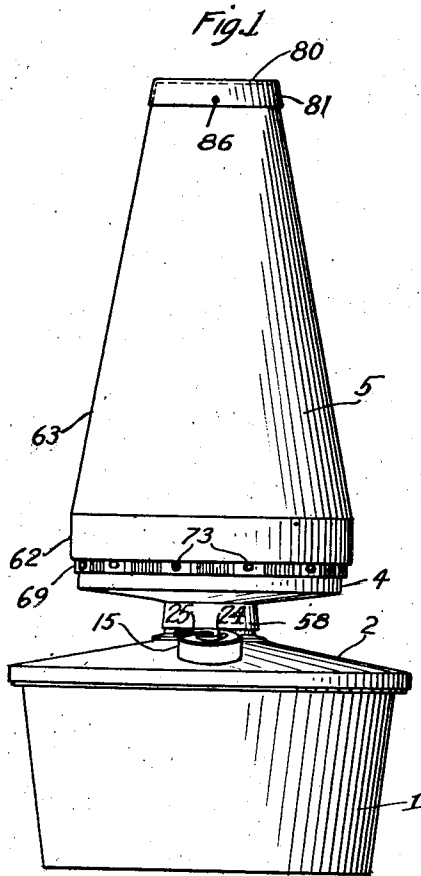
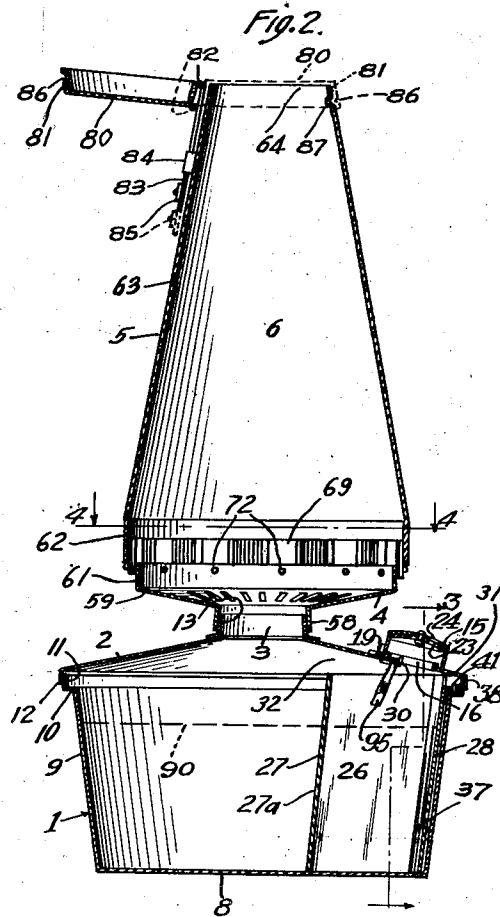
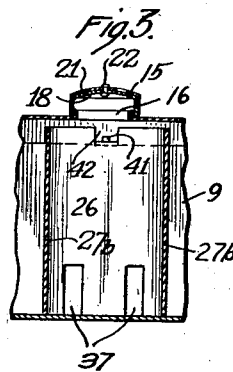
W. C. SCHEU

1,996,977

ORCHARD HEATER

Filed June 5, 1929

2 Sheets-Sheet 1



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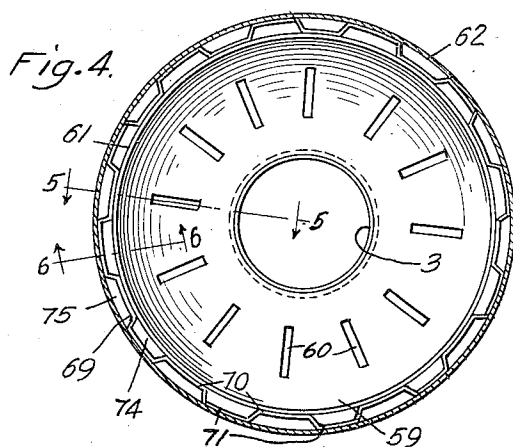
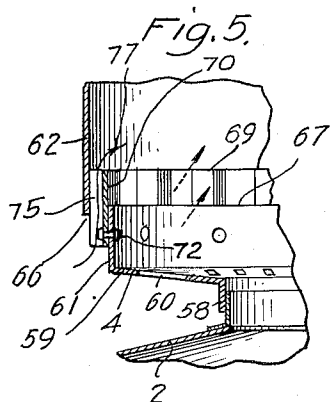
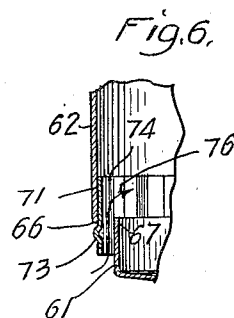
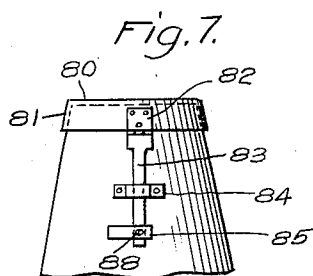
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ORCHARD HEATER

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

1,996,977

ORCHARD HEATER

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Application June 5, 1929, Serial No. 368,670

7 Claims. (Cl. 158—91)

This invention relates to orchard heaters and particularly to orchard heaters adapted to utilize liquid fuel.

The principal object of the invention is to provide an orchard heater having novel and advantageous means for effecting generation of vapors from the liquid fuel. A further object of the invention is to provide improved means for maintaining a uniform generating flame within a generating chamber partitioned off from the remainder of the fuel receptacle, and to permit passage of vapors generated both within and without said generating chamber upwardly into the stack to furnish a supply of vaporized fuel for the main combustion operation, which takes place inside the stack. A particular object of this invention is to provide a generating chamber of such a character that the generating flame can be maintained over a long period of time and in spite of gradual lowering of the fuel level due to consumption of the fuel, without requiring readjustment of the size of the exposed openings through which air is admitted to support said generating flame.

A further object of the invention is to provide an orchard heater in which there is a minimum formation and deposition of carbon or soot and in which such carbon as may be deposited within the heater will be deposited in such position as to be readily removed without requiring dismantling of the entire heater.

A further object of the invention is to provide for complete, or substantially complete, vaporization and combustion of liquid fuel placed in the fuel receptacle, so as to leave a minimum of unburned residual matter.

A further object of the invention is to provide improved means for igniting the fuel within the fuel receptacle of the heater.

A further object of the invention is to provide an orchard heater stack having improved means for admitting air thereto at points distributed around the periphery thereof and at a plurality of different levels, while excluding direct access of rain or wind to the interior of the stack.

The orchard heater of my present invention comprises, in general, a fuel receptacle having a substantially tight fitting cover provided with means for admitting a regulated quantity of air downwardly into the receptacle and with an outlet opening somewhat removed from said air admitting means, and partition means extending upwardly from the bottom of said receptacle and defining an enclosed vaporizing chamber directly beneath said air admitting means, said partition

means extending upwardly to somewhat above the maximum fuel level in the receptacle and being so constructed at its upper end as to permit outflow of vapors generated therein to said outlet opening in the cover, and suitable provision being made for inflow of fuel from the remainder of said fuel receptacle into said vaporizing chamber regardless of the fuel level in the receptacle. Many modifications may be made in the shape of the partition means and the manner of mounting the same in the fuel receptacle, and in the means for permitting inflow of fuel to said chamber and outflow of vapors therefrom, it being an essential feature of the invention, however, that the vaporizing chamber is located directly beneath the air admitting means and that the partition means shall be so disposed as to substantially confine the generating flame to said chamber while permitting free passage of the vapors generated therein upwardly to the outlet opening in the cover.

The heater also preferably includes a wick support disposed within or adjacent the air admitting means, whereby a piece of suitable wicking material, saturated with gasoline or other readily inflammable liquid, may be suspended thereon and ignited, to start combustion as hereinafter described.

The orchard heater further includes a stack mounted on the cover with its lower end in communication with the fuel receptacle, and the preferred form of stack of the present invention includes a lower cylindrical portion, a second cylindrical portion spaced outwardly somewhat from the lower cylindrical portion and extending both above and below the upper edge of said lower portion, and means disposed between said two cylindrical portions for maintaining the same in the relative positions aforesaid and for admitting air through the annular space between said two portions and delivering such air to the interior of the stack at a plurality of different angular positions around the stack and at a plurality of different levels.

The accompanying drawings illustrate orchard heater constructions embodying my invention, and referring thereto:

Fig. 1 is a side elevation of an orchard heater constructed in accordance with this invention.

Fig. 2 is a vertical section thereof.

Fig. 3 is a section on line 3—3 in Fig. 2.

Fig. 4 is a horizontal section of the stack on line 4—4 in Fig. 2.

Fig. 5 is a section on line 5—5 in Fig. 4, showing the means for admitting air to the stack.

Fig. 6 is a section on line 6—6 in Fig. 4.

Fig. 7 is a side elevation of the upper end of the stack, taken from the left side of Fig. 2, showing particularly the removable hinge mounting of the stack cover.

The orchard heater shown in general in Figs. 1 and 2 comprises a fuel receptacle 1 provided with a substantially tight fitting cover 2 having a central outlet opening 3, and a stack comprising a lower section 4 secured to the cover around said outlet opening and an upper section 5 secured to said lower portion and providing a combustion space 6 in the interior thereof.

The fuel receptacle is shown as comprising a bottom wall 8 and side wall 9, said side walls being advantageously formed in the shape of an inverted steep sided cone frustum having an outwardly off-set portion 10 near the upper end thereof and terminating in a vertical upper rim 11. The cover 2 preferably slopes upwardly toward the outlet opening 3 which is preferably located substantially centrally thereof, said cover being shown as a flat frustum of a cone and having a depending flange 12 at its outer edge, making a substantially tight fit with the rim 11 of the receptacle but being preferably removable therefrom. A short collar 13 is preferably secured to the cover and extends upwardly therefrom around the opening 3, so as to provide a convenient means for mounting the stack on the cover to communicate with said opening as hereinafter described.

Means such as indicated at 15 are provided on cover 2 between the central opening 3 and the outer rim portion of the cover for admitting air in regulated quantity downwardly through the cover near the side wall 9 of the fuel receptacle and at a position somewhat removed from the outlet opening 3. Said air-admitting and regulating means are shown as comprising a relatively large opening 16 in the cover for filling and igniting purposes, a cap member 18 hingedly mounted on the cover 19 and fitting around the edges of the opening 16, and a plate 21 pivotally mounted as at 22 on said cap member. A plurality of relatively restricted openings 23 of smaller area than opening 16 are provided in cap member 18 and an arc shaped opening 24 in plate 21 is adapted to be moved into or out of positions of partial or total alignment with one or more of said openings 23. Plate 21 may be provided with a handle 25 for rotation thereof to regulate the exposed area of the openings 23.

A wick support 29, shown as comprising a small strip of metal bent upwardly at its projecting end, as at 30, is preferably secured to the under side of cover 2 adjacent the inner edge of opening 16 and projecting partly across said opening for supporting a piece of wicking for igniting purposes, as hereinafter described.

Beneath the filling and igniting opening 16 in the cover and within the fuel receptacle I provide a vaporizing chamber 26, separated from the remainder of the fuel receptacle by suitable partition means 27. Said partition means may be of any suitable form. For example, as shown in Figs. 2 and 3, it may be formed as a wall enclosing chamber 26 on all sides and being of general rectangular cross section but having its outer wall 28 preferably curved to conform substantially to the curvature of the adjacent side wall of the fuel receptacle. Said partition is shown in the above mentioned figures as comprising an inner wall 27a and side walls 27b, in addition to the wall

28 aforesaid, and the walls 27a and 28 are shown as inclined somewhat and having substantially the same inclination as the adjacent side wall 9 of the fuel receptacle, while the side walls 27b are substantially vertical, so that the cross section of vaporizing chamber 26 is substantially the same throughout its height. However, the wall 27a may, if desired, diverge downwardly from the wall 28, so as to provide a vaporizing chamber of downwardly increasing cross section, and thus gradually increase the area of the exposed fuel surface within the vaporizing chamber as the fuel level is lowered. Also, if desired, the wall 27a may be made to converge downwardly toward the wall 28, so as to provide a vaporizing chamber of downwardly decreasing cross section. Furthermore, the partition means may, if desired, be of substantially circular or other suitable cross section instead of rectangular, with its outer edge preferably extending closely adjacent a portion of the side wall 9 of the fuel receptacle.

The upper edge of the inner wall of the partition means 27 is disposed beneath a portion of cover 2 lying between the opening 16 and the central opening 3, and said central opening is disposed wholly above the portion of the interior of the fuel receptacle which lies outside the partition means, so that vapors from the vaporizing chamber cannot pass directly upward into the stack, but must first pass inwardly beneath the cover until they reach the central vapor outlet opening 3.

The upper portion of the partition means of any of the forms above described is so constructed as to permit outflow of vapors generated therein through the space beneath cover 2 to the outlet opening 3 therein. For example, as shown in Fig. 2, the upper edge of partition 27 is shown as being substantially horizontal and substantially in contact with the cover 2 at its outer edge, as shown at 31, so that due to the inclination of said cover a space 32 is provided between the upper edges of walls 27a and 27b and said cover for outflow of vapors from generating chamber 26. If desired, either the side walls 27b or the inner wall 27a may be provided with openings or notches extending downwardly from their upper edges, to permit overflow of liquid fuel from the generating chamber 26 into the remainder of the fuel receptacle during filling, when such fuel is poured in through opening 16 after the regulating device 15 has been swung back upon its hinge 19, and thus facilitate filling of the receptacle with fuel. Said openings or notches at the upper edge of the partition means 27 may also be so located as to control the distribution of flow of the vapors from the generating chamber into the remaining portion of the fuel receptacle. The exact location of said openings may be determined in any case to give the desired operation, but it is in general desirable that any such openings in the partition 27 be located at or near the upper edge thereof, so that outflow of vapors from the generating chamber can take place only at or near the upper end thereof.

The partition 27 may rest upon the bottom wall 8 of the fuel receptacle, and in such case I prefer to provide openings in the lower portion of said partition for permitting flow of fuel from outside said partition into the generating chamber within said partition. Such fuel inflow openings are furthermore preferably of such size and located in such position as to prevent or minimize outflow of vapors therefrom, even though the fuel level should fall below the top of said openings.

For this purpose said openings may advantageously be located in the outer portion of the partition, that is, the portion adjacent the side wall 9 of the fuel receptacle. For example, as shown in Figs. 2 and 3, the fuel inflow openings 37 are shown as formed in the outer wall 28, and since said outer wall is in fairly close proximity to the side wall of the fuel receptacle, it is evident that but little if any outflow of vapors can take place through said openings even though the fuel level falls below the top of the openings. However, since the wall 28 is not held in tight engagement with the side wall 9, sufficient space is left therebetween for gradual inflow of fuel through said openings to replace the fuel vaporized or consumed within the vaporizing chamber. In case a partition of cylindrical or other non-rectangular cross-section is employed, the fuel inflow openings are also preferably formed in the portion of said partition which is closely adjacent the side wall 9 so as to substantially or wholly prevent outflow of vapors therethrough. Furthermore, in any case the fuel inflow openings, preferably extend upwardly to only a sufficient height to insure drainage of fuel from the entire receptacle into the vaporizing chamber in spite of any deposition of unburned residue from the fuel on the bottom of the fuel receptacle.

Any suitable means may be provided for holding the partition means in the proper position within the fuel receptacle, but I prefer to hingedly connect said partition adjacent its upper end to the fuel receptacle so as to permit raising of the partition from the bottom of the fuel receptacle when said fuel receptacle is tilted to remove the sediment from the lower portion thereof as hereinafter described. Such hinged connection may be provided by cutting out and bending down a portion of the outer wall 28 to form an ear 38 having an opening loosely engaging over a lug 41 secured to and extending upwardly from the offset portion 10 of the side wall so as to permit relative tilting of the partition 27 about a horizontal axis extending perpendicular to an imaginary line drawn from stud 41 to the center of the fuel receptacle. The bending down of the ear 38 also leaves an opening 42 in the upper portion of wall 28, which also permits overflow of fuel from the vaporizing chamber during filling as above described.

Instead of resting the partition means of any of the forms above described on the bottom of the fuel receptacle, I may terminate the same somewhat above the bottom and support said partition in some other manner, as, for example, by means of the ear 38 and lug 41 above described. In this case the space beneath the lower edge of partition 27 may suffice in general to permit the necessary flow of fuel into the vaporizing chamber, but, if desired, additional fuel inflow opening means may be provided corresponding to the opening means 37 above described and serving to insure proper drainage of fuel into the vaporizing chamber in spite of accumulation of residual matter in the lower portion thereof.

The lower member 4 of the stack is shown as comprising a neck portion 58 adapted to engage the collar 13 so as to normally hold the stack in position of communication with the outlet opening 3 of the cover but to permit removal of the stack when desired. For this purpose the collar 13 and neck portion 58 may be made to taper inwardly and upwardly, with said neck portion fitting around said collar, as shown in Fig. 1, or said collar and neck portion may be made to flare

outwardly and upwardly, with said neck portion fitting within said collar. In either case, the weight of the stack will hold said neck portion down in tight engagement with said collar, and maintain a substantially air-tight and vapor-tight fit at this point. Above said neck portion the stack member 4 extends outwardly as shown at 59, said outwardly extending portion 59 being, if desired, inclined upwardly somewhat toward its outer edge. Said outwardly extending portion 59 is preferably provided with a plurality of air inlet openings, such as slots 60 extending radially or in any other suitable manner and disposed at suitable intervals around the same, and it will be seen that said openings, being in the substantially horizontal or slightly sloping bottom portion 59, are well protected against access of rain or wind therethrough. The lower stack member 4 further comprises a substantially cylindrical portion 61 extending upwardly from the outer edge of portion 59.

The upper stack member 5 comprises a substantially cylindrical portion 62 and a frusto-conical portion 63 extending upwardly from said cylindrical portion and having an opening 64 at its upper end. The cylindrical portion 62 of said upper stack member is of somewhat greater inside diameter than the outside of the cylindrical portion 61 of the lower stack member, and suitable means are provided for supporting the upper stack member in position with the lower edge 66 of the cylindrical portion thereof extending somewhat below the upper edge 67 of the lower stack member and for permitting entrance of air between the overlapping portions of said stack members, so that the upper stack member overhangs and surrounds the lower stack member and thus prevents direct access of rain or wind therebetween.

The means for supporting the upper stack member may comprise a corrugated supporting and air distributing ring 69 whose corrugations extend vertically and comprise alternately arranged inwardly offset portions 70 and outwardly offset portions 71. The total overall thickness of ring 69, from the inner face of portions 70 to the outer face of portions 71 is substantially equal to the distance between the cylindrical portions 61 and 62 of the two stack members. Said ring is placed with its lower edge somewhat below the upper edge 67 of the lower stack member and its upper edge somewhat above said upper edge of the lower stack member, and the inwardly offset portions 70 thereof may be secured to cylindrical portion 61 as by means of rivets 72, while the outwardly offset portions 71 may be provided with outward projections or bumps 73, the cylindrical portion 62 fitting slidably around the upper portions of said outwardly offset portions and resting upon said outward projections or bumps. It will be seen that the upper stack member is thus normally held in proper position with respect to the lower stack member, but may be readily removed therefrom when desired. The corrugations of ring 69 serve to provide alternately disposed air inlet passages 74 and 75, the passages 74 being provided between the cylindrical portion 61 of the lower stack member and the outwardly offset portions 71, and the passages 75 being provided between the cylindrical portion 62 of the upper stack member and the inwardly offset portions 70. Furthermore, the air entering through inlet passage 74 is delivered to the interior of the stack at substantially the level of the upper edge 67 of the lower stack member, as

indicated by the arrow at 16 in Fig. 6, while the air entering through inlet passages 75 is delivered to the interior of the stack at substantially the level of the upper edge of the corrugated ring 69, as indicated by the arrow at 77 in Fig. 5, so that the above described construction provides for delivery of air to the interior of the stack at a plurality of separate points, and in a plurality of separate jets or streams, at different angular positions around the stack and at different elevations therein.

A cap or cover 80 is provided for closing the opening 64 at the upper end of the stack, said cover being provided with a depending flange 81 at its outer edge fitting fairly closely around the upper part of the stack. Said stack cover is supported by means of a hinge 82, so as to permit it to be swung either to open position as shown in Fig. 2 or to closed position as shown in Fig. 1. When said cover is in closed position the depending flange 81 would ordinarily prevent it from being swung about said hinge due to engagement thereof with the upper end of the stack, and I therefore prefer to mount the hinge 82 in such manner as to permit upward movement thereof sufficiently to bring the lower edge of flange 81 above the top of the stack or in such position as to swing clear of the same about said hinge. For this purpose the hinge 82 may be mounted at the upper end of a bar 83 which is adapted to slide vertically in suitable guide means such as strap 84 secured to the side wall of the stack. A stop member 85 is mounted on the bar 83 below the guide member 84 and is adapted to engage said guide member so as to limit the normal upward movement of said bar. Suitable means may be provided for releasably holding the stack cover 80 in closed position, said means comprising, for example, an inward projection 86 on flange 81 adapted to engage in a recess 87 in the wall of the stack. It will be seen that when the stack cover 80 is in closed position an upward pull of sufficient strength thereon will release the above described holding means and will first move the stack cover, together with hinge 82 and bar 83 upwardly until the cover is free to swing, and will thereafter swing the cover back about its hinge to open position. The stop member 85 normally prevents complete removal of bar 83 from guide means 84 during the above described operation of opening the cover, but in order to permit complete removal of the cover when desired, said stop member is preferably pivotally connected to bar 83, as shown at 88, so as to permit it to be swung into line with said bar, whereupon the bar, together with said stop member, may be withdrawn upwardly through said guide means.

In the operation of the above described heater, the fuel receptacle 1, including the space inside and outside the vaporizing chamber 26, is first filled with oil or other liquid fuel up to the desired level, for example some such level as indicated by the dotted line at 90 in Fig. 2, such fuel being poured in through opening 16 as above described and flowing from the vaporizing chamber into the remainder of the fuel receptacle through the opening means such as 37 adjacent the lower end of the partition means. Also, if it is desired to fill the receptacle more rapidly than is permitted by the flow through said openings, the fuel may be poured in at a faster rate so as to first fill the vaporizing chamber to the level of the upper edge thereof or of the opening 42 adjacent such upper edge and then over-

flow into the space outside the partition means. In starting the heater in operation a piece of wicking material, such as cloth or asbestos fabric may advantageously be placed over the wick support so as to depend therefrom below opening 16, as shown at 95 in Fig. 2, and a small amount of easily inflammable liquid such as gasoline is preferably poured through opening 16 onto said wicking so as to saturate the same, and also, if desired, onto the surface of the oil in the vaporizing chamber and is ignited in any suitable manner as by means of a lighted torch inserted through said opening. If desired, of course, the wicking may first be saturated with the gasoline or other igniting liquid, and then placed in the position shown and ignited. The wicking, being supported out of contact with the walls of the vaporizing chamber, is allowed to burn freely, without causing deposition of soot or carbon on said walls. The cap member 18 is then lowered to position around the opening 16, the opening 24 of plate 21 being so adjusted as to expose the desired area of openings 23 for admitting air during the initial period of the operation. The heat produced by combustion of the igniting liquid within the vaporizing chamber causes vaporization of a portion of such liquid and also of the more volatile portions of the fuel oil, and the vapors thus generated pass upwardly in the vaporizing chamber and from the upper end thereof, either over the top or through the opening means adjacent the upper edge, and thence through the upper part of the fuel receptacle and beneath cover 2 to the outlet opening 3, and up into the stack. For starting combustion of these vapors in the stack, a small amount of gasoline or other readily inflammable liquid may be poured on the inside of the walls of the stack and ignited concurrently with the ignition in the vaporizing chamber. The vapors entering the stack will thereupon be also ignited and burn in the presence of air admitted through the several opening means in the stack. As soon as the vaporizing chamber and the fuel therein is heated sufficiently to cause a continual generation of vapors from such fuel, these vapors will furnish the fuel for the generating flame, a certain proportion of such vapors burning in the presence of air admitted through openings 23 and opening 16 to produce an intense flame directed downwardly from said openings toward the surface of the fuel in the vaporizing chamber. After the operation is well started, it is generally desirable to readjust the opening 24 so as to decrease the exposed area of openings 23 and admit just enough air to produce a generating flame of the desired intensity and volume. Said generating flame serves to heat the oil in the vaporizing chamber not only by direct impingement of the hot flame or combustion products on the surface of the oil and by radiation from the flame to the oil, but also by heat conducted to the oil through the heated walls of the vaporizing chamber. After this first readjustment, very little regulation is required, and I have found that it is possible to obtain substantially complete vaporization and combustion of all of the fuel within the receptacle without any further readjustment of the air admitting openings.

It is evident that the vaporization of the fuel during operation of the heater will take place principally within the vaporizing chamber inside the partition means, but the opening means adjacent the lower edge of said partition means, such as the openings 37, or the space beneath

the lower edge of the partition means, permits a gradual inflow of fuel from the part of the fuel receptacle outside the partition means into said vaporizing chamber, so that substantially all of the fuel within said receptacle, with the exception of that portion vaporized outside the partition means, is eventually permitted to flow into the vaporizing chamber and be vaporized therein. Due to the fact that the greater portion of the vaporization of the fuel occurs within the vaporizing chamber, there will in general be a greater accumulation of residual unvolatilized material or ashes accumulating on the bottom of the fuel receptacle within said vaporizing chamber than outside the partition means, and it may, therefore, be desirable from time to time to remove such residual matter therefrom. This may be accomplished without removing the cover from the fuel receptacle, by simply tilting said receptacle to a position so as to raise the side of the receptacle at which the vaporizing chamber is located and thus permit such residual matter to be removed by gravity from the bottom of the vaporizing chamber to other portions of the fuel receptacle. It will also be seen that the pivotal mounting of the partition means adjacent its upper edge will permit said partition means to swing clear of the bottom of the receptacle when said receptacle is tilted in this manner, thus permitting free movement of the residual matter along the bottom of the receptacle and out of the vaporizing chamber.

It will be understood that before starting the heater in operation, the stack cover 80 is swung to open position as above described and as shown in Fig. 2, so as to permit free exit of the flame and hot products of combustion through the opening 64 at the upper end of the stack. When the heater is not in use, however, said cover may be moved to closed position.

I claim:

1. An orchard heater comprising a fuel receptacle having a cover provided with means for admitting a regulated quantity of air downwardly into the receptacle and with an outlet opening somewhat removed from said air admitting means, partition means extending upwardly from the bottom of said receptacle and defining an enclosed vaporizing chamber directly beneath said air admitting means, said partition means being so formed and disposed as to permit outflow of vapors from only the upper portion of said vaporizing chamber into the space outside the partition means and to permit inflow of liquid fuel from said space outside the partition means into only the lower portion of said vaporizing chamber, and means pivotally supporting said partition means adjacent the upper end thereof upon said fuel receptacle, so as to permit said partition means to swing clear of the bottom of the receptacle when said receptacle is tilted.

2. A stack for orchard heaters comprising a lower member having a vapor inlet opening at its lower end, an upper member having its lower portion surrounding and spaced from the upper portion of said lower member and overlapping the same, and a corrugated ring disposed between the overlapping portions of said upper and lower members, the corrugations of said ring providing passages for admission of air between said overlapping portions into the interior of the stack.

3. A stack for orchard heaters comprising a lower member having means for admission of vapors to the lower end thereof, an air distributing ring secured to said lower member and having vertical corrugations extending above and below the upper edge of said lower member, and an upper member mounted upon and around said air distributing member providing passages for admission of air to the interior of the stack.

4. A stack for orchard heaters comprising a lower member and an upper member having their respective upper and lower portions overlapping and with the lower portion of the upper member surrounding and spaced from the upper portion of the lower member, an air distributing ring disposed between the overlapping portions of said upper and lower members and having vertical corrugations enclosing alternate inwardly and outwardly offset wall portions and defining passages for admission of air to the interior of the stack, means securing the inwardly offset portions of said ring to the lower stack member and means on the outwardly offset portions of said ring for supporting the upper stack member.

5. An orchard heater comprising a fuel receptacle having bottom and side walls and provided with a cover, partition means extending upwardly within said receptacle and defining an enclosed vaporizing chamber inside said partition means and separate from the remainder of the fuel receptacle, detachably interengaging means on said partition means and on the side wall of said fuel receptacle for removably supporting and positioning said partition means within said receptacle on said side wall thereof independent of said cover, said partition means being so formed and positioned as to permit outflow of vapors formed within said vaporizing chamber from only the upper portion thereof while permitting inflow of liquid fuel from outside said partition means into the lower portion of said vaporizing chamber, means for admitting a regulated quantity of air downwardly into said vaporizing chamber, wholly at one side of said partition means, and an opening in the cover for permitting outflow of vapors from said fuel receptacle, said opening in the cover lying wholly at the opposite side of said partition means from said air admitting means.

6. An orchard heater as set forth in claim 5, said supporting and positioning means for the partition means being adapted to permit pivotal movement of said partition means relative to said fuel receptacle so as to permit said partition means to swing clear of the bottom of the fuel receptacle when said receptacle is tilted.

7. An orchard heater comprising a fuel receptacle having a cover provided with an air admitting opening, partition means within said receptacle defining a vaporizing chamber directly below said air admitting opening, and a wick support secured to said cover and projecting from an edge of said air admitting opening partly across said opening in a position substantially vertically above the central portion of said vaporizing chamber so as to support a piece of wick material saturated with igniting liquid in position adjacent said opening completely out of contact with all portions of the walls of said vaporizing chamber.

WILLIAM C. SCHEU.