

W. C. SCHEU.
 ORCHARD HEATER.
 APPLICATION FILED MAR. 18, 1913.

1,136,902.

Patented Apr. 20, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

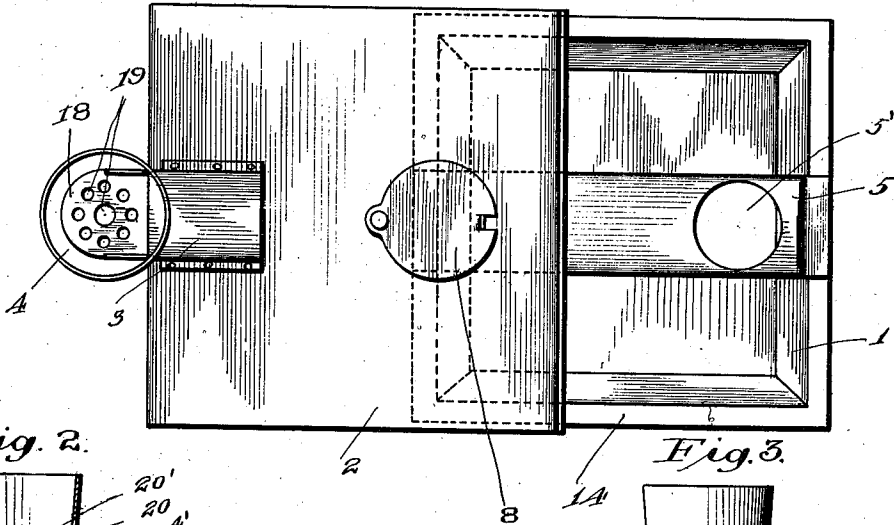


Fig. 2.

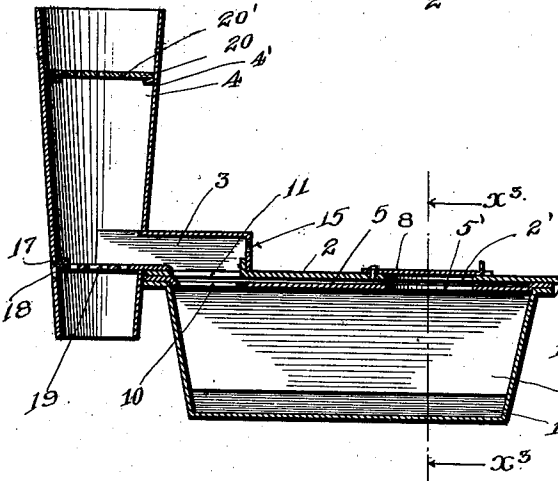


Fig. 3.

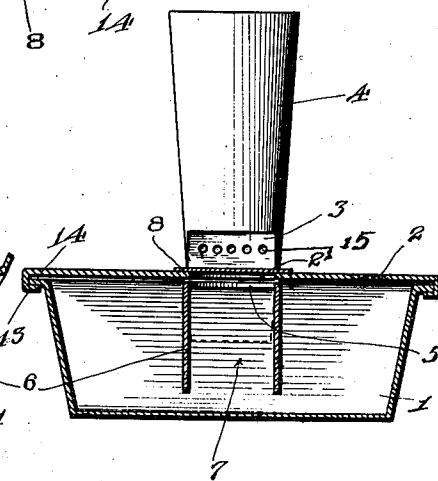
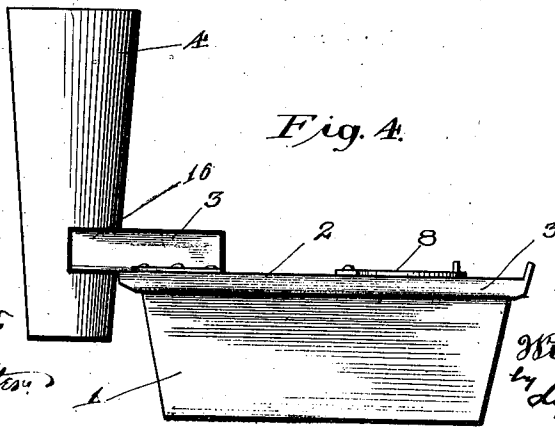


Fig. 4.



Witnesses:
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2 SHEETS—SHEET 2.

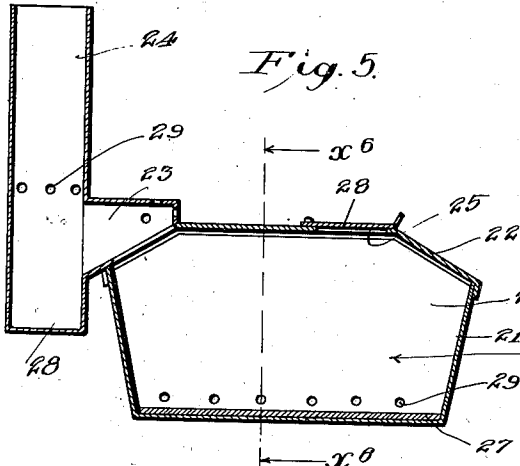


Fig. 5.

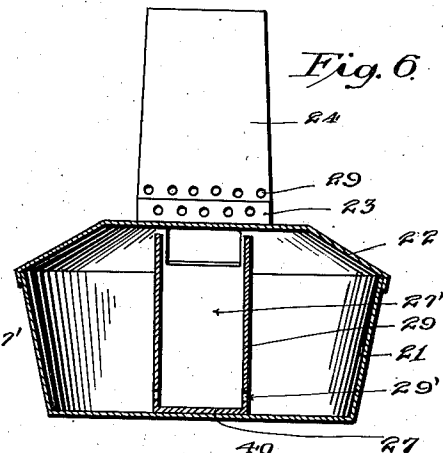


Fig. 6.

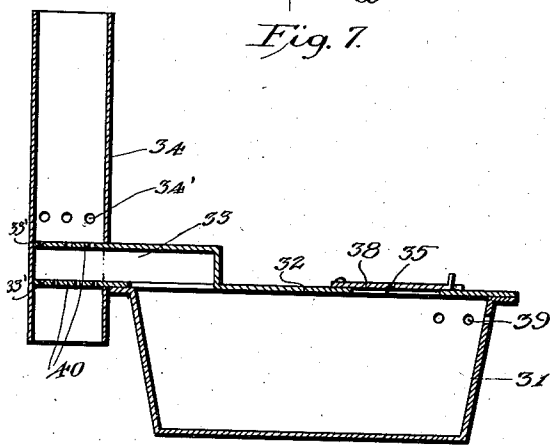


Fig. 7.

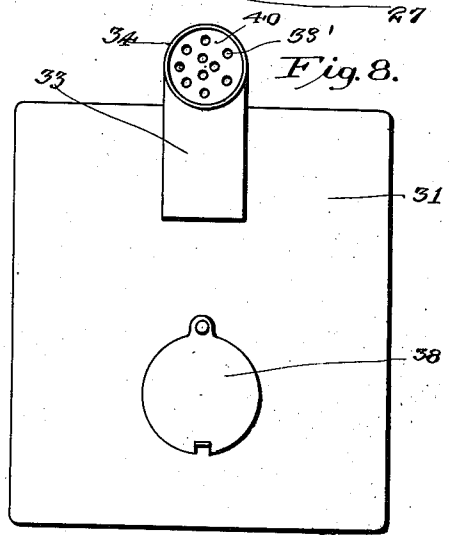


Fig. 8.

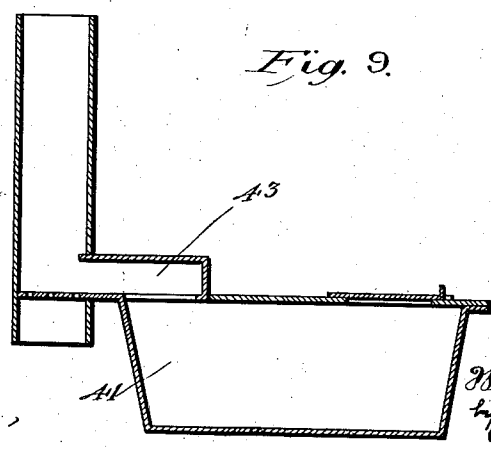


Fig. 9.

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UNITED STATES PATENT OFFICE.

WILLIAM C. SCHEU, OF GRAND JUNCTION, COLORADO.

ORCHARD-HEATER.

1,136,902.

Specification of Letters Patent.

Patented Apr. 20, 1915.

Application filed March 18, 1913. Serial No. 755,251.

To all whom it may concern:

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

This invention relates to a device for burning oil, or other liquid fuel, to produce heat for the protection of orchards, or for other purposes, and the main object of the invention is to provide a heater which will burn the fuel with efficiency and with a minimum of smoke or soot.

A further object of the invention is to provide a heater capable of burning for an extended time with efficient combustion, and of simple and cheap construction.

Other objects of the invention will appear hereinafter.

The accompanying drawings illustrate embodiments of my invention, and referring thereto: Figure 1 is a plan of one form of the invention, showing the cover partially removed. Fig. 2 is a vertical section of the heater with the cover in place. Fig. 3 is a transverse section on line x^3-x^3 in Fig. 2. Fig. 4 is a side elevation of the heater. Fig. 5 is a vertical section of another form of the heater. Fig. 6 is a section on line x^6-x^6 in Fig. 5. Fig. 7 is a vertical section of another modification of the invention. Fig. 8 is a plan of the form shown in Fig. 7. Fig. 9 is a vertical section of another modification.

The heater comprises an oil tank or reservoir 1, of any suitable cross section, for example, square, as shown in Fig. 1, a cover member 2 removably mounted on said tank, a mixing device 3 connected to receive combustible mixture generated by heating the fuel in tank 1, and stack 4 which also serves as a combustion chamber for the combustible mixture.

A draft flue and generator chamber is preferably provided in the tank 1, formed, in the form shown in Figs. 1 to 3, by a sheet metal member 5 resting at its ends on the end walls of the tank 1 and having depending side walls or portions 6 which extend nearly to the bottom of the tank 1, so as to partition off a central draft flue and generator chamber 7, in said tank and separate such chamber from the remainder of the interior of the tank, while allowing oil or liquid fuel to flow from the tank into the

bottom of said chamber 7. Member 5 is provided with an air inlet opening 5' and cover member 2 is provided with an air inlet opening 2' registering with the air inlet opening 5', an air inlet valve 8 being provided on the cover member to allow the air inlet opening 2' to be wholly or partly closed. The air inlet openings 2' and 5' are preferably located near one end of the generator chamber 7, and near the other end of said chamber, the member 5 and the cover 2 are provided respectively with vapor outlet openings 10 and 11 communicating with the mixing chamber or box 3. In the form shown in Figs. 1 to 4, the cover member 2 is provided with downturned flanges 13 adapted to slide over horizontal flanges 14 on the tank 1, and the mixing chamber and stack are mounted on the cover member, but as hereinafter explained, the invention may be variously modified in these respects.

Mixing chamber 3 is provided at its rear end, *i. e.*, at the end away from the stack, with air inlet openings 15, and opens at its opposite end into the interior of the stack 4. The stack 4 may be of any suitable form and is preferably removable from the cover, being provided with an aperture 16 in one side fitting over the mixing chamber 3 and with inwardly extending lug 17 which rests on top of a horizontal extension 18 from the bottom of the mixing chamber. Said extension 18 extends across the stack and is provided with perforations 19 so as to cause the air entering the bottom of the stack to be distributed into the mixture passing from the mixing chamber. A damper plate 20 is preferably provided in stack 4 resting on a bead 4' in said stack and provided with perforations 20' through which the flame passes out of the stack, this damper serving to retard the flow of heat and retain the heat in the stack, so as to assist in maintaining combustion.

The operation is as follows: The tank 1 is filled with oil or liquid fuel up to the desired level, oil occupying the lower part of the chamber 7, as well as the rest of the tank. Combustion is then started by igniting gasoline, paper or other combustible placed in the chamber 7, with the result that the interior of the tank becomes heated sufficiently to cause generation of vapor from the body of oil in the chamber 7, the air inlet valve member 8 being opened sufficiently to allow enough air to enter to support the partial

combustion and conduce generation of vapor in this manner, but not sufficient for complete combustion of the vapor so generated. The vapor so generated passes along the chamber 7 and out through the outlet 10 to the mixing chamber 3, wherein it is mixed with a further quantity of air passing through the inlets 15, producing a mixture which enters the stack and burns therein on coming in contact with the air passing through the perforations 19 in the bottom plate 18, so that the portion of the stack adjacent the mixer serves as a combustion chamber. On account of the effective mixing of the air with the vapor before combustion, a substantially smokeless flame, of great heating efficiency, is produced in this combustion.

The oil tank or receptacle 1 may be of any suitable form. Figs. 5 and 6 illustrate a form in which this tank is round, and they further illustrate other modifications of the device as follows:

The cover 22 is formed with sloping sides so as to shed water and the stack 24 is formed of oblong cross section with its greatest width extending transversely of the line of the draft from the mixer 23, so as to spread the flame laterally. Said stack is also shown in these figures as provided with perforations 29 in the side for admitting air to support combustion and the bottom of the stack is closed as at 28 to serve as a firing pan for receiving combustible in starting the device in operation. The air inlet opening 25 in the cover is closed more or less by means of the valve or closure member 28. In this form of the invention the draft flue or generator chamber is formed by a U-shaped member 27 resting on the bottom of the tank 21 and having side walls 29 extending up into proximity with the top member 22, said side walls 29 being provided with perforations 29' for permitting oil to flow between the space 27' within the member 27 and the remainder of the tank 21. The operation of this form of my invention is substantially the same as above described.

Some of the features of my invention may be used without the others, for example, the draft flue and generator chamber may be omitted, as shown in Figs. 7 and 8, the oil tank 31 serving in this case as the generator chamber. These figures also show the formation of the mixing chamber directly in the stack 34, a chamber 33 being formed on the tank 31 and provided with upper and lower walls extending laterally therefrom into the stack 34, and being provided with perforations 33' in said upper and lower walls of said extension to permit air coming from below to enter through the lower perforations 33' and mix with the vapor passing from chamber 33, the resulting mixture passing out through the upper perforations

33' and being burned by combustion with air entering from perforations 34' in the stack 34. The tank 31 is provided with an air inlet 35 in its cover 32 regulated by a valve or closure member 38, so as to admit the required amount of air for partial combustion with oil so as to continuously generate vapor, additional openings 39 being provided if necessary, in the side walls of the tank 31 to supply sufficient air for this purpose. In the operation of this form of my invention the partial combustion of the oil in the tank 31, supported by air passing through inlets 35 and 39, produces a vapor which passing through the chamber 33 becomes mixed with air in the mixing chamber between the upper and lower walls 40 of the extension of said mixing chamber and is burned in the stack as above described.

The mixing chamber may be formed on the cover as above described, or as illustrated at 43 in Fig. 9, it may be formed on the body of the oil tank or receptacle 41.

What I claim is:

1. A heater comprising a tank for containing liquid fuel, a cover therefor, means for supplying a restricted amount of air in said tank to produce partial combustion and generation of vapor from the fuel contained therein, a mixer communicating with said tank to receive the vapor therefrom, and provided with air inlet means for mixing air with said vapor, and a stack communicating with said mixer to receive the mixture of air and vapor therefrom and to serve as a combustion chamber therefor, said stack being provided with air inlet means for supplying air to support combustion of said mixture.
2. A heater comprising a tank for containing liquid fuel, a cover therefor, vertical partitions extending across said tank forming a draft flue and generator chamber communicating at its lower portion with the remainder of the tank, air inlet means in the cover of the tank near one end of said draft flue and generator chamber for supplying a restricted amount of air to said draft flue and generator chamber in said tank to produce partial combustion and generation of vapor from the fuel contained therein, a mixer communicating with said draft flue and generator chamber in said tank at the other end of said draft flue and generator chamber to receive the vapor therefrom, and provided with air inlet means for mixing air with said vapor, and a stack communicating with said mixer to receive the mixture of air and vapor therefrom and to serve as a combustion chamber therefor.

3. A heater comprising a tank for containing liquid fuel, a cover therefor, means for supplying a restricted amount of air in said tank to produce partial combustion and generation of vapor from the fuel contained therein, a mixer communicating with said

tank to receive the vapor therefrom, and provided with air inlet means for mixing air with said vapor, a stack communicating with said mixer to receive the mixture of air and vapor therefrom and serve as a combustion chamber therefor, and a perforated plate in said stack below the top thereof for retarding the passage of flame from the stack.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 10th day of March, 1913.

WILLIAM C. SCHEU.

In presence of—
ARTHUR P. KNIGHT,
MARTHA M. LANG.