Oct. 4, 1938. A. HATVELT 2,132,294

HEATER

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Fig. 1.

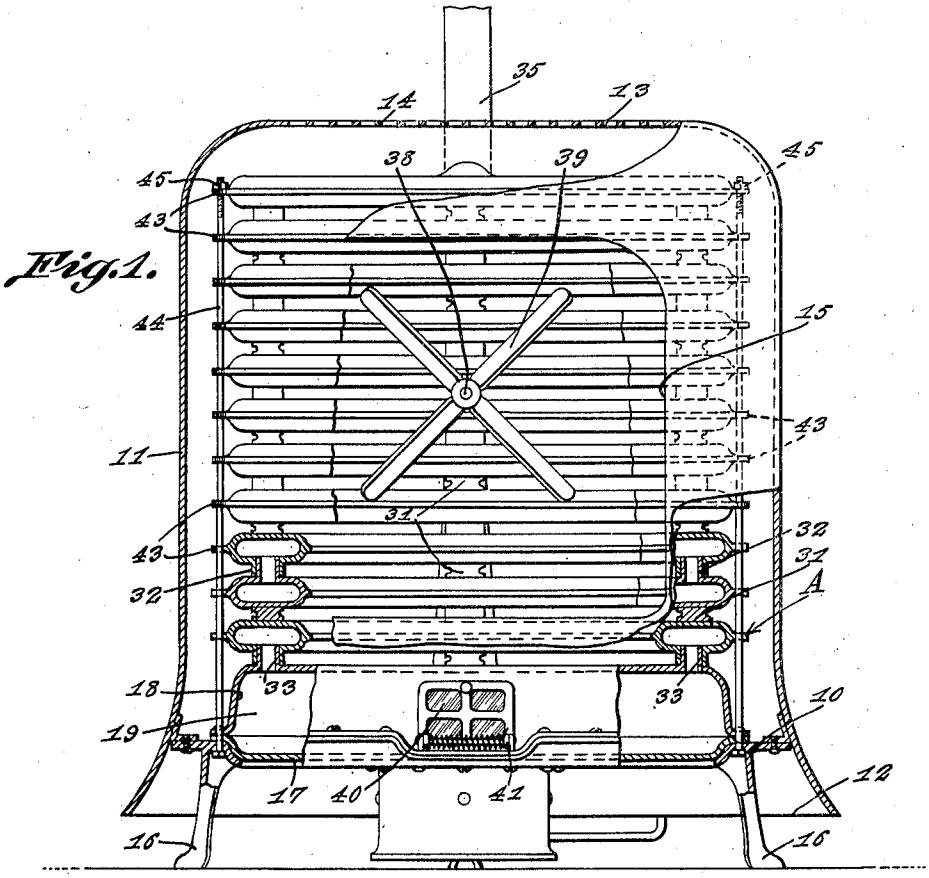
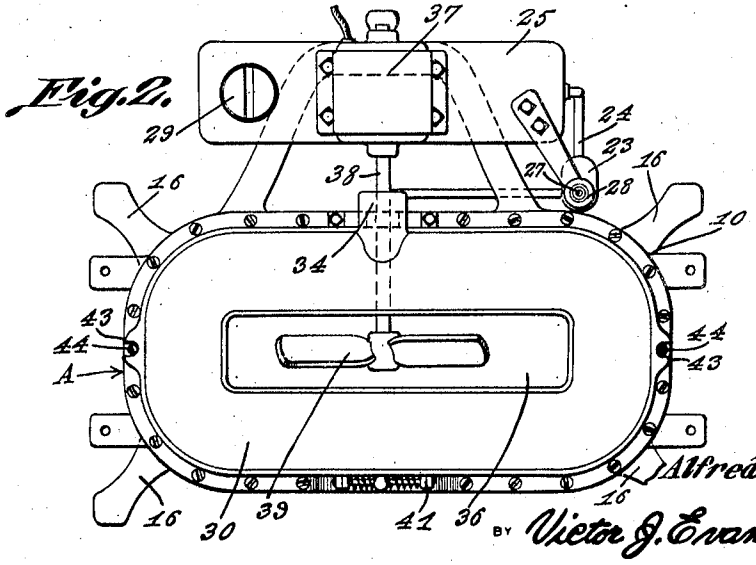


Fig. 2.



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Fig. 3.

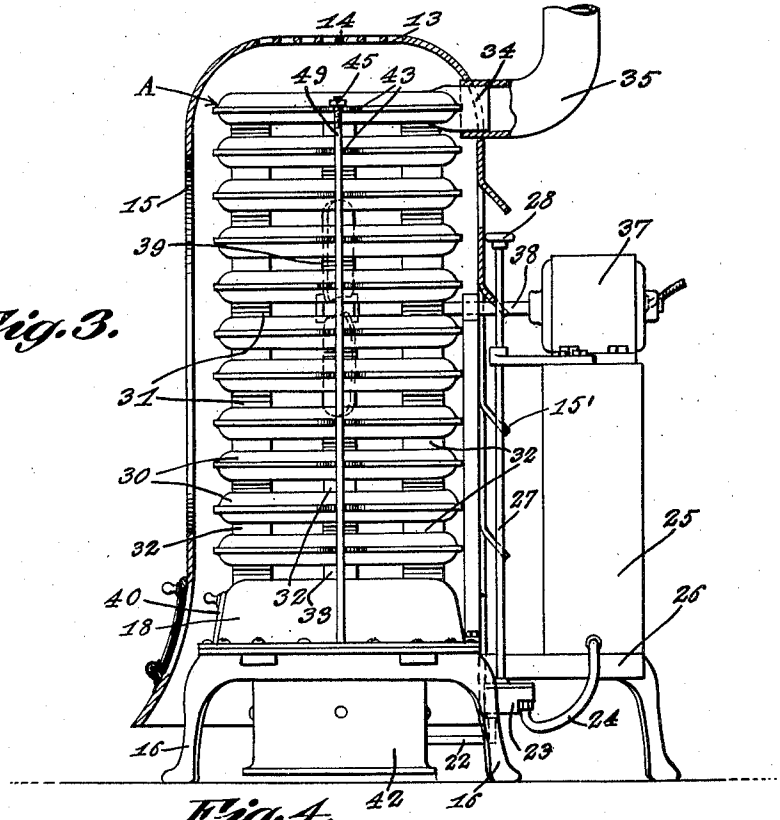


Fig. 4.

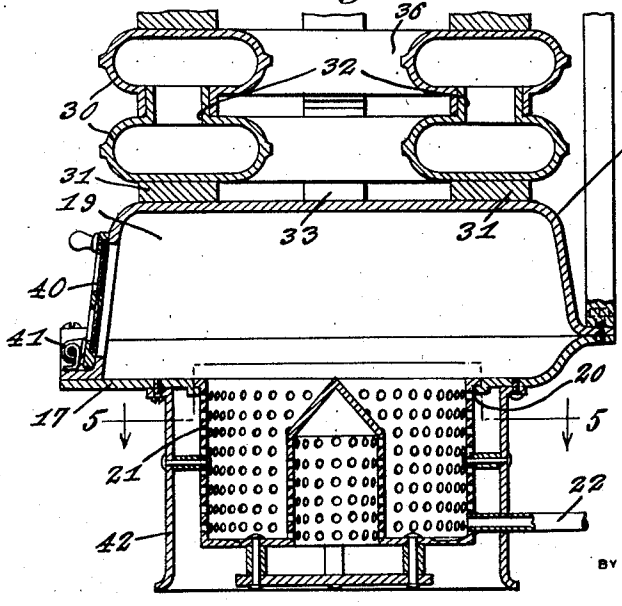
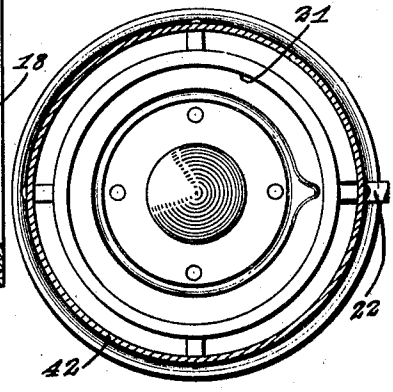


Fig. 5.



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UNITED STATES PATENT OFFICE

2,132,294

HEATER

Alfred Hatvelt, Missoula, Mont.

Application July 26, 1937, Serial No. 155,791

4 Claims. (Cl. 126—110)

The invention relates to a heater and more especially to an oil heater.

The primary object of the invention is the provision of a heater of this character, wherein through the use of oil as fuel, air passing through the heater will be subjected to maximum radiating surface for the heating thereof in a minimum period of time and with the least possible fuel consumption, the heater in its entirety being of novel construction.

Another object of the invention is the provision of a heater of this character, wherein the largest possible heat units may be given off without stack or chimney loss thereof and thus assuring economy in fuel consumption for air heating, the air heated being subjected to a force draft under the action of a motor driven fan.

A further object of the invention is the provision of a heater of this character, wherein the products of combustion flow in a zigzag course through a series of horizontally disposed spaced tube-like radiator units or sections, these being arranged vertically stacked within a casing and deliver the spent products of combustion to a flue or stack while the air which is circulated about and between the said units or sections will be subjected to a maximum radiating surface created by the said units or sections for the heating of the air when forced into an enclosure or room for the heating of the same.

A still further object of the invention is the provision of a heater of this character, which is simple in its construction, thoroughly reliable and efficient in operation, possessed of maximum heating qualities, economical in fuel consumption, neat in appearance and inexpensive to manufacture.

With these and other objects in view, the invention consists in the features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawings, which disclose the preferred embodiment of the invention, and pointed out in the claims hereunto appended.

In the accompanying drawings:

Figure 1 is an elevation partly in vertical section of a heater constructed in accordance with the invention.

Figure 2 is a top plan view of the heater unit with the casing removed.

Figure 3 is a side elevation of the heater unit with the casing shown in section.

Figure 4 is a fragmentary enlarged vertical transverse sectional view through the heater.

Figure 5 is a sectional view on the line 5—5 of Figure 4 looking in the direction of the arrows.

Similar reference characters indicate corresponding parts throughout the several views in the drawings.

Referring to the drawings in detail, A designates generally a heater constructed in accordance with the invention and embodies a burner stand 10 which also constitutes the base section for a casing or housing 11 of substantially oval formation in cross section having a flared open bottom 12 and a grated top outlet opening 13, respectively, the grate 14 thereof being the hot air outlet while this casing or housing 11 at its front is formed with a relatively large air outlet window or opening 15, the gear being formed with a louvered opening 15'.

The stand 10 is provided with legs 16 and supports a bottom plate 17 to a products-of-combustion header 18 forming a combustion chamber 19 therein. This bottom plate 17 centrally thereof is formed with an opening 20 through which is carried the upper portion of an oil burner 21, oil feed thereto being had by a conduit 22 leading from an oil trap 23. This oil trap 23 by a pipe connection 24 has communication with an oil reservoir or tank 25 bracketed at 26 to the stand 10. The trap is fitted with a cut-off valve (not shown) and controlled by a turning stem or operating rod 27 vertically disposed and suitably supported, the stem or rod 27 at its upper end being fitted with a hand grip 28 readily accessible for the turning on or turning off of the valve hereinbefore mentioned and in this manner the oil supply from the reservoir or tank 25 to the burner 21 is regulated.

The reservoir or tank 25 at its top is fitted with a filling cap 29 removable therefrom.

Within the casing or housing 11 above the header 18 is a series of vertically spaced horizontally arranged tubular radiator units or sections 30, these being vertically separated from each other by interposed spacer blocks 31 and are communicative with each other through the medium of alternately arranged coupling nipples 32, the lowermost section or unit of the series being in communication with the chamber 19 through dual couplings 33 while the uppermost section or unit of the series has an outlet coupling 34 with a stack or chimney pipe 35 suitably joined with the casing or housing 11.

The sections or units 30 are provided with substantially rectangular shaped open centers 36 registering with each other vertically through the series of said sections or units and together

constitute an air passage or air circulating way through the said section or unit while air circulation within the casing 11 takes place outside of the series of units or sections between the same and the said casing, this air circulation being also had between the sections or units in their vertically spaced relation to each other.

Suitably fixed at the top of the reservoir or tank 25 is an electric motor 37, its power shaft 38 rotating a bladed fan wheel 39 arranged within the center openings 36 with respect to certain of the units or sections 30 in the series thereof. The motor 37 when operated drives the bladed fan wheel 39 causing a suction of air into the casing or housing 11 and thence forcing it about the sections or units 30 and finally driving the heated air from within the said casing or housing 11 out through the outlets 14 and 15 for distribution exteriorly of said casing or housing. This air circulated by the fan wheel 39 is heated, being subjected to a maximum radiating surface created by the stacked series of sections or units 30 to be quickly heated thereby in the working of the oil burner 21. The chamber 19 is accessible from the front of the casing or housing 11 by a transparent paneled door 40 hinged at 41 to the said housing or casing for closing a doorway leading directly into the said chamber.

Surrounding the oil heater 21 is an air conducting annulus or circular shell 42 for the admission of air to the burner for the proper operation thereof. Maximum heating of air will be had by the heater with a minimum consumption of fuel.

Engaged with the stand 10 and also accommodated in laterally extending ears 43 formed with the units or sections 30 are anchoring rods 44, these being held in place by nuts 45 threaded thereon at their upper ends and in this manner the units or sections 30 are secured assembled with the header 18 and also the latter with the stand 10.

What is claimed is:

1. A heater of the character described comprising a stand, a header supported on the stand and forming a combustion chamber, a plurality of endless tubular radiator sections vertically spaced from each other and above the header and having communication with each other for effecting a zigzag heat circulating course therethrough and from the header, an oil burner associated with said header, a casing surrounding the tubular sections to provide air passages adjacent thereto, a discharge flue passing through said casing and communicating with the uppermost of said sections, and a motor driven fan operating centrally within said sections.

2. A heater of the character described comprising a stand, a header supported on the stand and forming a combustion chamber, a plurality of endless tubular radiator sections vertically spaced from each other and above the header and having communication with each other for effecting a zigzag heat circulating course therethrough and from the header, an oil burner associated with said header, a casing surrounding the tubular sections to provide air passages adjacent thereto, a discharge flue passing through said casing and communicating with the uppermost of said sections, a motor driven fan operating centrally within said sections, and a fuel supply tank supported by said stand exteriorly of the casing and having communication with the burner.

3. A heater of the character described comprising a stand, a header supported on the stand and forming a combustion chamber, a plurality of endless tubular radiator sections vertically spaced from each other and above the header and having communication with each other for effecting a zigzag heat circulating course therethrough and from the header, an oil burner associated with said header, a casing surrounding the tubular sections to provide air passages adjacent thereto, a discharge flue passing through said casing and communicating with the uppermost of said sections, a motor driven fan operating centrally within said sections, a fuel supply tank supported by said stand exteriorly of the casing and having communication with the burner, and means for controlling the fuel supply to the said burner and accessible outside of the casing.

4. A heater of the character described comprising a stand, a header supported on the stand and forming a combustion chamber, a plurality of endless tubular radiator sections vertically spaced from each other and above the header and having communication with each other for effecting a zigzag heat circulating course therethrough and from the header, an oil burner associated with said header, a casing surrounding the tubular sections to provide air passages adjacent thereto, a discharge flue passing through said casing and communicating with the uppermost of said sections, a motor driven fan operating centrally within said sections, a fuel supply tank supported by said stand exteriorly of the casing and having communication with the burner, and means for controlling the fuel supply to the said burner and accessible outside of the casing, the said casing having an outlet grating at its top and a relatively large open front.

ALFRED HATVELT.