

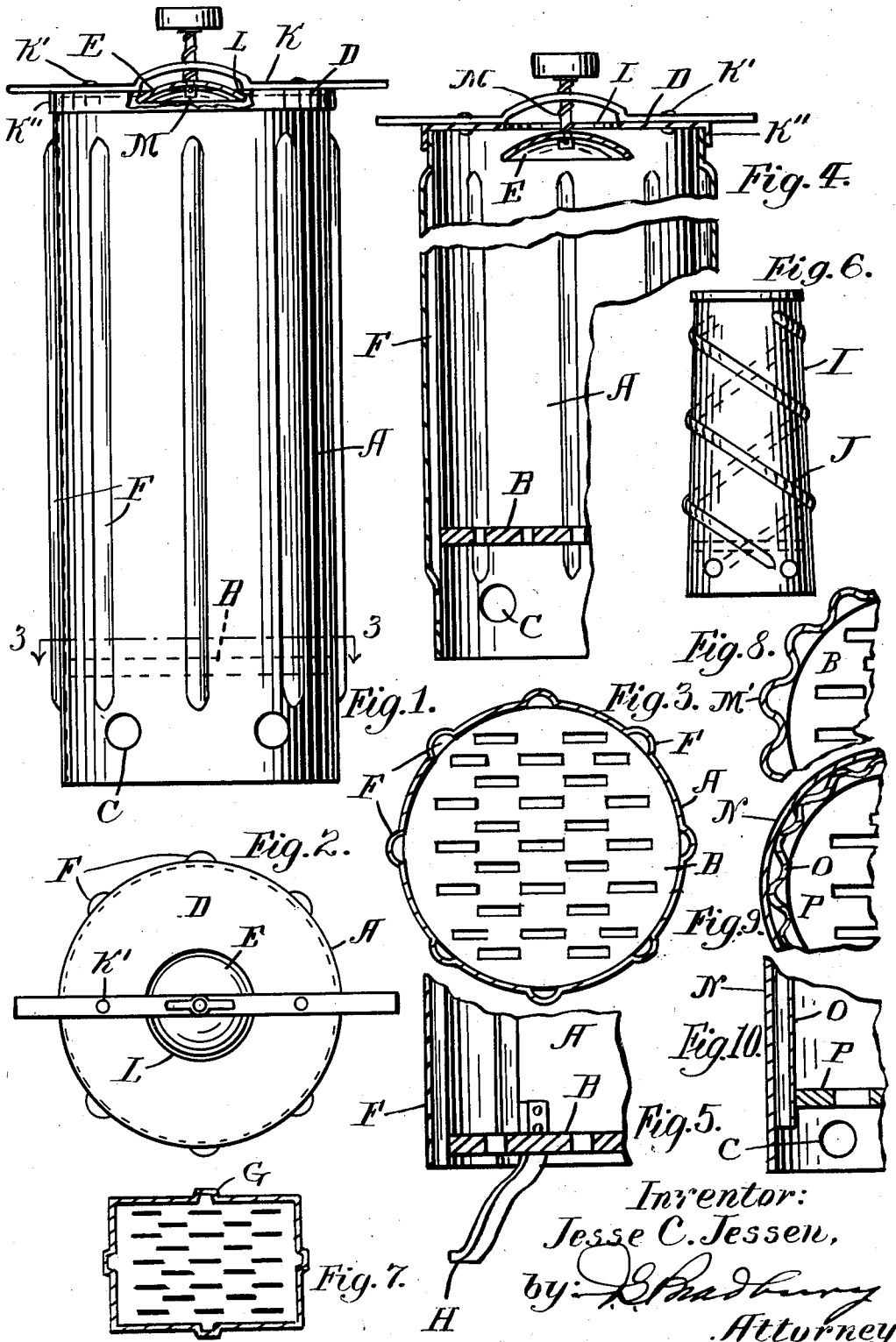
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HEATER

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HEATER

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This invention relates to devices that can be effectively used for heating orchards and other purposes, the primary object being to provide a heater in which the fuel will burn from the outside, horizontally inwardly and downwardly in an even and effective manner, whereby even side heat radiation is produced over an extended period to facilitate frost prevention over the largest possible area and a low priced fuel can be consumed most economically without undue smoking. A further object is to provide a heater of the class stated which requires little or no attention after the fuel is ignited and until the fuel has been consumed, during which period heat is radiated laterally in an even manner. A still further object is to provide a heater in which the fire can be easily and quickly put out when danger of frost is past, thus preventing the burning of fuel unnecessarily. Among other objects is the production of a heater having maximum simplicity and low cost of production, coupled with more perfect combustion of the fuel and greater effectiveness in use.

With these and other objects in view, my invention comprises the features of construction and combination of parts hereinafter described and claimed.

In the accompanying drawing, forming part of this specification, Fig. 1 is a side elevation of my improved heater when designed for heating orchards; Fig. 2 is a plan of the structure shown in Fig. 1; Fig. 3 is a section taken on line 3—3 of Fig. 1; Fig. 4 is a vertical section of an enlarged detail of the structure shown in Fig. 1; Fig. 5 is a vertical section, resembling part of that portion of the heater shown in Fig. 4, only of alternative construction; Fig. 6 is a side elevation of a modified construction of my improved heater; Fig. 7 is a horizontal section of another modified construction; Fig. 8 is a horizontal section of a detail showing an alternative construction; Fig. 9 is a vertical section of a detail showing still another alternative construction, and Fig. 10 is a vertical section of the structure shown in Fig. 9.

Heaters such as are commonly employed for heating orchards and other purposes are frequently operated by the use of solid or liquid fuel and it is desirable to supply air to the point of combustion freely from the side so that the fuel will burn from the outside inwardly and vertically in an even manner over a prolonged period. To accomplish this result most effectively I have produced a heater in which solid fuel is used and in which upwardly extending draft passages are

formed to create evenly distributed upward currents of air which are adapted to feed oxygen to the outer side portion of and above the fuel so that the fuel burns substantially horizontally inwardly and downwardly in an even manner over a prolonged period.

One form of the application of my improved structure is illustrated in Figs. 1 to 4 inclusive, in which a combustion chamber is formed by a cylindrical casing or body A made out of sheet metal or other suitable material. This casing is adapted to be placed on end and a grate B of any suitable design is supported horizontally a short distance above the lower end, the portion of the casing below the grate being provided with draft inlet openings such as C. The top of the casing has a removable lid or cover D by the removal of which fuel such as briquettes or any other form may be placed upon the grate and the receptacle filled. Usually space is left near the top of the fuel in the heater for a kindler by which the fuel is ignited or the kindler is buried in the fuel near the top. The fuel is thus adapted to burn from the top downwardly. The lid is provided with a combination damper and baffle E, by which upward draft from the burning fuel is regulated or checked as will be hereinafter described. As a result the tendency is for the fuel to burn downwardly slowly in an efficient manner for orchard heating purposes, the supply of air from below being subdued by the volume of fuel above. To overcome this draft subduing tendency I provide upwardly extending channels F which are produced by pressing or otherwise forming grooves in the inner surface of the wall of the casing, said channels opening inwardly at the side of and above the fuel and extending from below the grate upwardly to a point in proximity to the upper extremity of the casing. These channels provide ample and substantially evenly distributed draft of air inwardly to the side of the charge of fuel on the grate and in the heater and to the combustible gases which tend to collect above the fuel and tend to cause the fuel to burn steadily horizontally inwardly and downwardly until entirely consumed. As many of the ducts and corrugations, evenly spaced apart circumferentially are produced as is necessary to supply the requisite amount of oxygen evenly to cause burning of the fuel freely and steadily over a prolonged period. As shown the channels extend from below the grate to feed air upwardly. They may however open to admit outer atmosphere immediately below the grate as shown in Fig. 5. In this modi-

fication the casing terminates immediately below the grate and is supported by legs such as H to freely admit air to the channels F through the grate B. The channels F may also extend to the top of the casing or terminate and merge into the casing at any height desired. In other words they may be of any length. The cross sectional shape of the corrugation forming an air draft duct F may be curved as illustrated in Fig. 3 or any shape desired. Fig. 7 showing one of many other forms and in which an angular shape is employed.

The lid D resembles a flat ring to the upper surface of which is diametrically secured a handle bar K by rivets K'. The rim of said ring is flanged downwardly at K'' to close over the rim and hold the cover on the body. The central draft orifice L in the lid is closed or modified by the circular damper and baffle plate E which is adjusted or closed by a pinion M which is threaded in the handle bar K. When the orifice L is opened by screwing the pinion M downwardly, the damper and baffle E is lowered into the position shown in Fig. 4. In lowered open position the combination damper and baffle E regulates and tends to direct draft emanating from the draft channels F, inwardly and upwardly to the orifice L. The damper and baffle E is dished upwardly to shed water and the handle bar K is bowed upwardly over the orifice L to accommodate the damper and baffle. The damper and baffle E also acts as a draft regulator, its open position determining the size of opening for the draft. When the draft orifice L is closed and the cover or lid placed over the upper end of the body, the body is made air tight, thus preventing circulation of air upwardly above the grate thereby causing fire to go out without consumption of additional fuel. When desired a solid lid can be used in place of the structure described above or a lid having a damper of any suitable construction can be employed.

The shape of the casing may be cylindrical as shown in Fig. 1 or any other shape desired, Fig. 6 illustrating a truncated conical shell I forming the body, and Fig. 7 showing a rectangular shape in cross section, the latter illustrating one of many modifications in cross sectional shape contemplated. Also the draft ducts F in the shell may extend in a direct line upwardly as shown in Fig. 4 or they may extend upwardly in an indirect manner, Fig. 6 also illustrating one of many forms and in which duct J extends upwardly in a spiral direction, thus tending to impart a whirling effect to the current of air draft supplied to the side of and above the fuel within the casing. The ducts F may also be unevenly distributed circumferentially if desired.

The method of forming the upwardly extending draft ducts in the casing may be by pressing, rolling, stamping, casting or otherwise forming corrugations or other forms of channels in the material out of which the casing is made or they may be constructed by joining strips of material together, all of which are contemplated within the spirit of my invention.

The entire wall of the casing may be formed out of corrugated sheet metal as indicated by M' in Fig. 8. In this construction as well as in the forms described above, the corrugations serve to hold the fuel away from the side wall and from closing the upward air draft channels. Also when desired the upward air draft channels can be produced by a plain outer casing wall N (see Figs. 9 and 10) and a corrugated lining O, the

grate P being secured to the lower end of the lining.

In use when hard lump fuel is employed in the heater on the grate, the damper and baffle E is regulated to gauge the exit of the products of combustion and the speed of burning of the fuel. During combustion of the fuel air feeds up through the draft channels F to supply oxygen around the side of and above the fuel and promote more complete combustion horizontally from the side inwardly and downwardly.

In accordance with the patent statutes, I have described the principles of operation of my invention, together with the construction which I now consider to represent the best embodiment thereof but I desire to have it understood that the structure shown is only illustrative and that the invention can be carried out by other means and applied to uses other than those above set forth within the scope of the following claims.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a heater of the class set forth, the combination of a fuel receptacle, a fuel supporting grate confined in the lower portion of said receptacle to produce a fuel bed, said receptacle having an ingress opening for supplying air to the receptacle below the grate, channels in its side wall opening inwardly throughout their length and extending from below to a point above the grate, and the upper end of said receptacle having an orifice for the egress of the waste products of combustion from the fuel on the fuel bed and a combined damper and baffle associated with said orifice adapted to cause such gases as arise from the central portion of the fuel bed to be directed outwardly thereafter to mix with air from said channels.

2. In a heater of the class set forth, the combination of a fuel receptacle, a fuel supporting grate confined in the lower portion of and cooperating with said receptacle to produce a fuel bed, said receptacle having an ingress opening for supplying air to the receptacle below the grate and air conducting channels extending upwardly in its side wall opening inwardly throughout their length and extending from below to a point above the grate, the upper end of said receptacle having a centrally disposed orifice for the egress of the waste products of combustion, and means tributary to the central upper portion of said receptacle for causing such gases as arise from the central portion of the fuel bed to be directed outwardly thereafter to mix with air from said channels.

3. In a heater of the class set forth, the combination of a fuel receptacle, and a fuel supporting grate confined in the lower portion of said receptacle, said receptacle having an ingress opening for supplying air to the receptacle below the grate, an egress opening near its upper end for the exit of the products of combustion, and a plurality of evenly distributed upwardly extending draft passages in its inner side wall, said passages extending from below the grate to a point near the upper end of the receptacle above the grate and adapted to create evenly distributed upward currents of air, and baffle means associated with said egress opening for causing such gases as arise from the central portion of the fuel bed to be directed outwardly thereafter to mix with the air from said passages.

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