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OIL BURNING HEATING APPARATUS

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Fig. 1

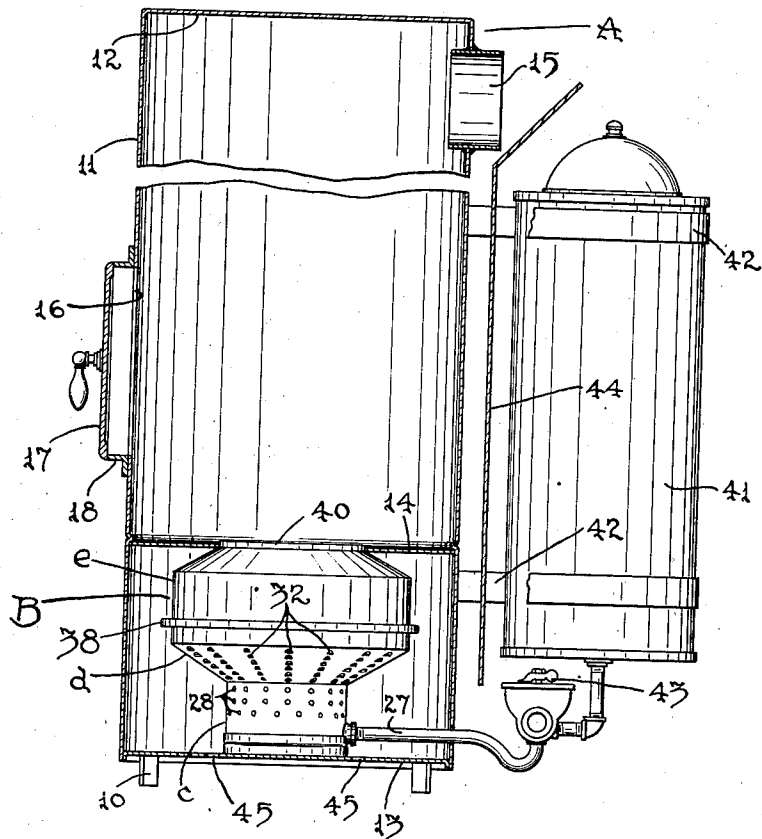
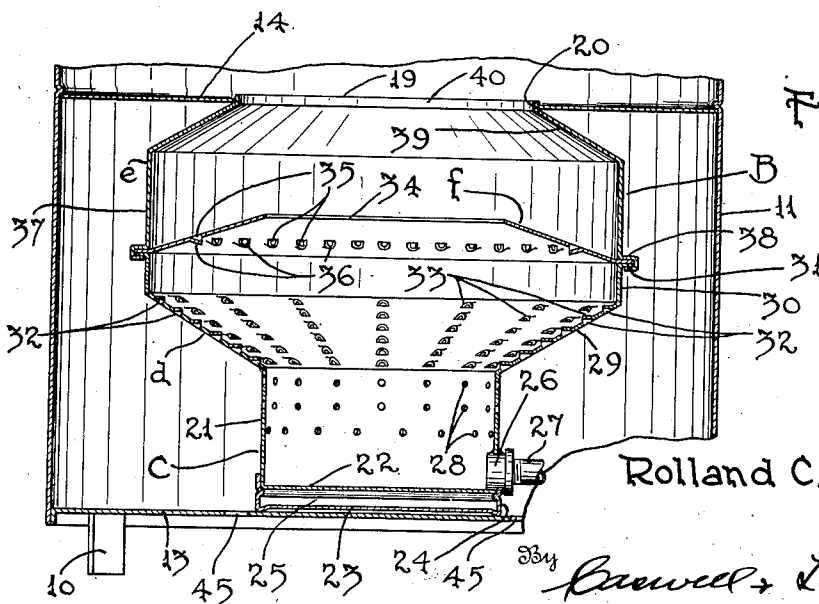


Fig. 2



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OIL BURNING HEATING APPARATUS

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5 Claims. (Cl. 158-91)

My invention relates to improvements in oil burning heating apparatus and particularly to oil burners, an object thereof being to provide a highly efficient and contrastedly inexpensive oil burner of the pot-type which is light in weight and readily adaptable to the various uses to which such burners are put.

A further object of the invention is to provide a burner of the present nature constructed principally of sheet metal, the parts being designed so that they may be rapidly and inexpensively constructed and likewise assembled to complete the structure.

A further object of the invention is to enhance the safety of burners of the present type by providing a burner in which a minimum quantity of accidentally accumulated oil will operate, through the medium of conventional feeding equipment, to cut off the supply of oil to the burner.

Another object of the invention is to provide an oil burner of the pot-type designed efficiently to maintain the burner flames in each stage of a relatively great range of stages.

With the foregoing and other objects in view, which will appear in the following description, the invention resides in the novel combination and arrangement of parts and in the details of construction hereinafter described and claimed.

In the drawing, Fig. 1 is mainly a vertical central sectional view of a heating appliance in which is incorporated an oil burner of the pot-type embodying my present invention, said burner being shown in elevation, and Fig. 2 is an enlarged fragmentary view of the burner structure shown in Fig. 1, the same being illustrated in vertical section, centrally thereof.

Referring to the drawing in which similar reference characters designate similar parts throughout the several views, it will be observed that the illustrated heating appliance includes a heating drum A supported on legs 10, said drum having an upright cylindrical body 11, a top 12, a bottom 13 and a horizontal partition 14 between said top and bottom. At the upper portion of the drum body 11 is a flue collar 15 with which a stove pipe (not shown) is attached in the usual manner. Beneath this flue collar 15 and above the horizontal partition 14, the drum body 11 is provided with an access opening 16, said opening being normally closed by a door 17 hingedly mounted on a door frame 18 encompassing said opening 16 and attached to said drum body.

The pot-like burner of my present invention, indicated in its entirety by the reference letter B, is shown as disposed between the bottom 13 and

partition 14 of the drum A, said burner resting on said bottom 13, while the mouth 19 thereof opens into the upper portion of the drum through a central opening 20 in said partition 14.

The burner B, preferably formed entirely of sheet metal, includes a generating well c, body d, head e and an internal baffle f. The generating well c consists of an upright cylindrical wall 21, a bottom proper 22 and a second bottom 23, spaced from said first bottom through the medium of an annular connecting flange 24, said bottoms 22 and 23 being spaced apart to provide a heat insulating air space 25 therebetween for the purpose of preventing the dissipation of heat from the inner bottom 22. Near said inner bottom 22, the wall 21 of the generating well c is fitted with a coupling 26 to receive a pipe 27 for introducing fuel oil into said well c. About the upper portion of the generating well c, the wall 21 thereof is formed with a multiplicity of air openings 28 which admit combustion supporting air to said well.

The body d of the burner B is hopper-like in form and includes a wall portion 29 flaring outwardly and upwardly from the wall 21 of the generating well c, there being in continuation of said flaring wall portion 29 an upright cylindrical wall portion 30 terminating in a horizontally disposed annular flange 31. This flaring wall portion 29 has a multiplicity of air admitting openings 32 formed therein. Said openings may consist simply of die-formed apertures, but preferably are produced, as illustrated, by forming louvers 33 in the flaring wall portion 29. In either case, the axes of the openings 32 are directed horizontally in a radial direction through the axis of the burner body d. The annular baffle f surmounts the burner body d, its outer annular margin resting upon the flange 31 of said body. This baffle f, conical in form, flares upwardly and inwardly from the burner body d, the opening 34 in said baffle being centered axially of the body d and generating well c. Said baffle f is formed with a multiplicity of apertures 35 distributed about the same, these apertures, as shown, being provided by forming louvers 36 in said baffle. The head e of the burner B includes a cylindrical wall portion 37 formed with a horizontal footing flange 38 bearing upon the outer marginal portion of the baffle f which is seated upon the horizontal flange 31 of the body d. This footing flange 38 is crimped around the baffle f and also around the flange 31 on the body d rigidly to unite said body d, baffle f and head e in unitary fashion. In upward and inward continuation of said wall por-

tion 37 of the head *e* is a sloping wall portion 39 having a short vertical flange 40 forming the mouth 19 of the burner, said mouth and the opening 34 of the baffle *f* and said generating well *c* being co-axially disposed. As shown, this short vertical flange 40 on the burner head *e* is snugly received in the burner opening 20 in the partition 14 of the heating apparatus to which the burner is applied.

The fuel oil pipe 27 may be connected with any suitable source of supply and regulation of the flow of oil therethrough to the generating well *c* may be effected in any suitable manner selectively to produce high or low flame or flames at various intermediate stages. In the drawing I have illustrated a fuel supply tank 41 supported by straps 42 secured to the drum wall 11 of the heating appliance. The supply pipe 27 leading to the generating well *c* of the burner B is connected with this tank 41 at the bottom thereof and in this pipe 27 is fitted a metering valve 43 of conventional construction for regulating the flow of oil into the burner. Interposed between the drum wall 11 and tank 41 and supported by the tank supporting straps 42 is a guard 44 shielding said tank from the heat radiating from said wall.

The bottom 13 of the heating drum supplies a footing for the supporting flange 24 of the well *c*, said bottom 13 having a plurality of openings 45 therein for admitting air to the burner B.

In operation, liquid fuel is admitted to the well *c* of my burner by opening the metering valve 43 more or less according to the existing heating requirements, such fuel, of course, being ignited to start the initial generation of gases to be burned. This generation of gases initially and in the continued operation of the burner is enhanced by reason of the relatively small diameter of the well *c* into which the liquid fuel is admitted and by reason of the heat insulated bottom of the well structure which retains the heat in such structure for generating purposes. Employing a conventional metering valve having a number of settings ranging from a minimum low setting to a maximum high setting, the feeding of liquid fuel into the well *c* of the burner is regulated to produce flames of varying sizes. At the low setting of the metering valve 43, a flame of minimum size is produced, the same burning in the region of the mouth of said well *c* and receiving its combustion supporting air from the openings 20 in the wall 21 of said well. As the settings of the metering valve 43 are advanced, the burner flames are correspondingly increased in size, the outward flaring of the louvered burner body *d* affording proportionately increasing diametrical capacity for said flames as they grow proportionately larger upon advancing the metering valve setting. At all stages of the burner flame, the louvered baffle *f* functions to return heated gases, burned and/or unburned, from the outer annular portion of the space within the burner head *e* to the interior of the burner body *d* with the result that the efficient burning of the gases beneath the baffle *f* is insured and with the further result that the flame characteristics at all settings of the metering valve 43 remain substantially constant. In other words, the fuel gases are completely burned in the flames, which, though of different sizes, have substantially the same color and substantially the same patterns symmetrically shaped relative to the axis of the burner.

The herein indicated advantages residing in

my improved burner, afford, in a single burner structure, the equivalent of any of a plurality of burners of different capacities capable of efficient operation.

Changes in the specific form of my invention, as herein disclosed, may be made within the scope of what is claimed without departing from the spirit of my invention.

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

1. In a burner of the pot-type, a generating well having air admitting openings in the upper portion thereof, a body flaring outwardly and upwardly from said well and formed with air admitting openings therein about the same and at different elevations, a head in upward continuation of said body, said head being flared inwardly and upwardly at its upper portion said head and body forming a combustion chamber, said head having a central opening therein forming the mouth of the burner, an annular baffle disposed wholly within the combustion chamber flared upwardly and inwardly and apertured about the opening therein for the return of gases of high temperature to the interior of the burner body.

2. In a burner of the pot-type, a body flaring outwardly and upwardly and formed with louvered air admitting openings therein about the same, and at different elevations, a head in upward continuation of said body said head and body forming a combustion chamber, said body having a central opening therein forming the mouth of the burner, an annular baffle disposed wholly within the combustion chamber flared upwardly and inwardly and provided with louvered openings therein for the return of gases of high temperature to the interior of the burner body, the axes of said louvered openings in said body and baffle extending substantially horizontally in radial disposition with respect to the vertical axis of the burner structure.

3. In a pot-type burner, a vaporizing well having air admitting openings about the same in the upper portion thereof, a body flaring outwardly and upwardly from said well and formed with air admitting openings therein at different elevations about the same, a head in continuation of said body having a central mouth forming opening therein, an annular baffle within the burner structure inwardly and upwardly inclined therein, said baffle being formed with marginal openings about the same for returning gases of high temperature from the interior of the burner head to the interior of the burner body, and means for introducing fuel oil into the well of the burner, said well, body and head having a common vertical axis, said air admitting openings in said body and the marginal openings in said baffle being arranged to direct the passageway therethrough respectively, of air and gases substantially horizontally in radial directions relative to said common vertical axis.

4. In a burner of the pot-type, a generating well, an annular wall extending outwardly from said well and formed with air admitting openings therein, a cylindrical wall structure extending upwardly from said annular wall, a second annular wall extending inwardly from the uppermost portion of said cylindrical wall structure and having a central opening therein forming the mouth of the burner, and an annular baffle within the burner disposed intermediate the first and second named annular walls and extending inwardly from the cylindrical wall structure, said cylindrical wall being imperforate above said

baffle, the central opening in said baffle being concentric with the mouth of the burner, said baffle having return openings therein intermediate the central opening and the cylindrical wall structure, said return opening being beneath said second annular wall outside of the vertical confines of the mouth-forming opening therein.

5. In a burner of the pot-type, a generating well having air admitting openings in the upper portion thereof, an annular wall flaring outwardly and upwardly from said well and formed with air admitting openings therein, an imperforate cylindrical wall structure extending upwardly from said flaring wall, a second annular wall flaring inwardly and upwardly from the uppermost portion of said cylindrical wall struc-

ture and having a central opening therein forming the mouth of the burner, and an annular baffle within the burner disposed intermediate the first and second named annular walls and flaring inwardly and upwardly from the cylindrical wall structure, the central opening in said baffle being concentric with the mouth of the burner and having return openings therein intermediate the central opening and the cylindrical wall structure, said return openings extending in a substantially horizontal direction and being disposed beneath said second annular wall outside of the vertical confines of the mouth-forming opening therein.

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