

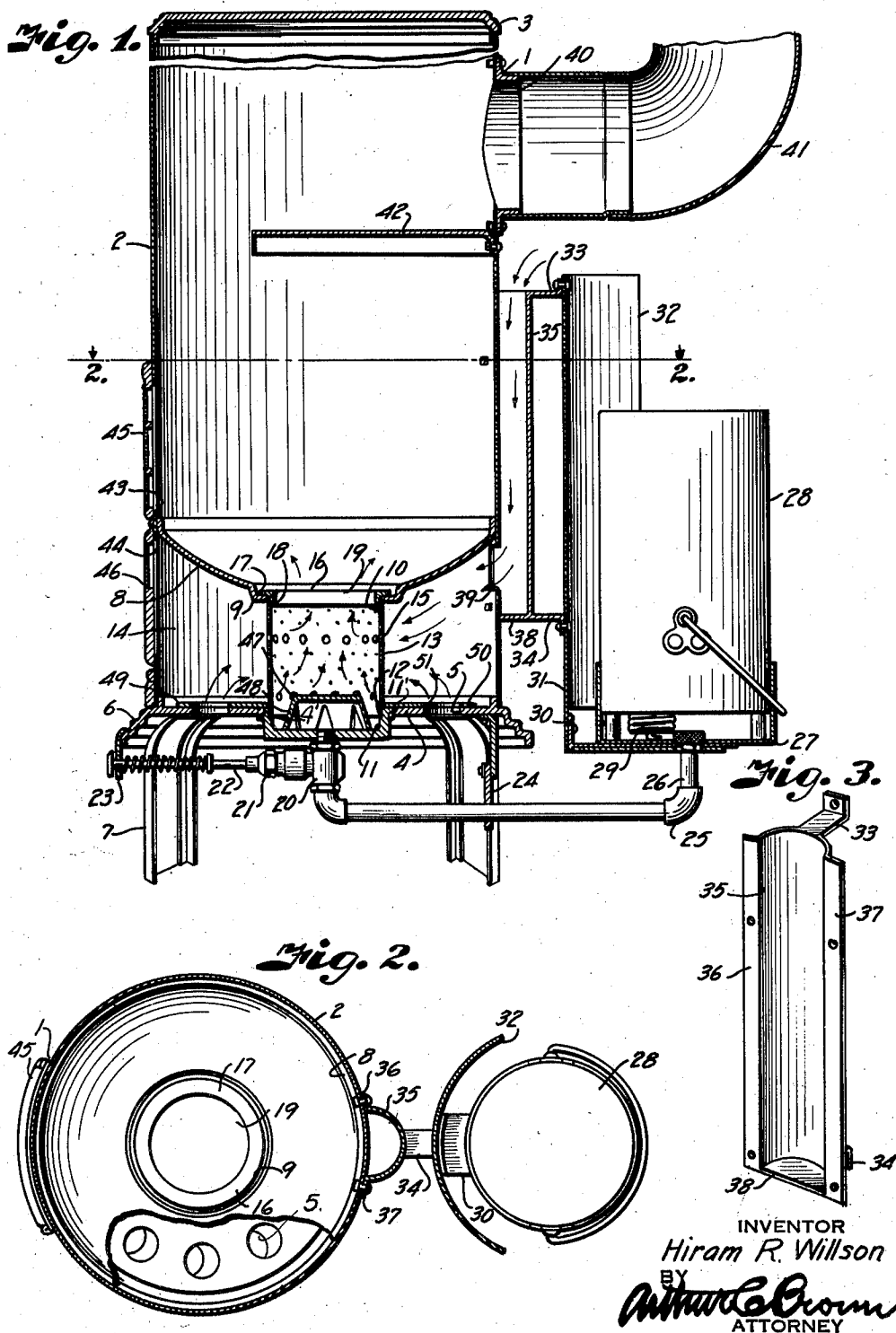
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H. R. WILLSON

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STOVE

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STOVE

Hiram R. Willson, Leavenworth, Kans., assignor to  
Great Western Stove Company, Leavenworth,  
Kans., a corporation of Kansas

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9 Claims. (Cl. 126—93)

This invention relates to stoves, particularly to those for burning fuel oils, such as furnace oil or light colored distillate, and has for its principal object to provide a stove of this character which is capable of efficient operation throughout the entire range of burner adjustment, that is, from low fire to high fire, thereby providing any degree of heat which it is desired to generate.

- 10 Other important objects of the invention are to provide a stove of this type with a simple, inexpensive preheater whereby a part of the combustion air is heated prior to its mixture with unheated air; to provide for selectively proportioning the ratio of the unheated air to the preheated combustion air; and to provide for mixture of the unheated and heated combustion air prior to admission into the combustion chamber.

15 In accomplishing these and other objects of the invention, as hereinafter pointed out, I have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawing, wherein:

Fig. 1 is a vertical section through a stove embodying the features of the present invention.

Fig. 2 is a horizontal section through the stove on the line 2—2 of Fig. 1.

Fig. 3 is a detail perspective view of the preheater for a part of the combustion air supply.

- 20 Referring more in detail to the drawing:

1 designates a stove which includes a shell 2 preferably cylindrical in cross-section and having its upper and lower ends closed by plates 3 and 4. The upper plate 3 is of solid construction, however, the lower plate has a plurality of air inlet openings 5 arranged in circular series about the axis of the shell and through which air is admitted, as later described. The lower plate 4 has an outwardly and downwardly flaring skirt 6 to which legs 7 are attached for supporting the shell above the floor and to provide space whereby air may flow to the openings 5. Mounted in the shell 2 at a point spaced above the plate 4 is a concavo-convex division member 8 arranged with its concave side uppermost. Formed in the bottom of the division member is a down-set, annular seating flange 9 encircling an opening 10 that aligns with a bowl 11 that is supported by lugs 11' in an opening 4' of the bottom plate 4.

Suspended within the opening 10 and having its lower end seated on an annular shoulder 12 of the recess 11 is a combustion chamber including a cylinder 13 which further cooperates with the shell 2 to form an annular air chamber 14

between the division member 8 and bottom plate 4. The wall of the combustion cylinder is provided with a plurality of various sized openings 15 designed to admit sufficient air for supplying requirements of the blaze rising within the combustion chamber during operation of the stove.

Seated upon the flange 9 is a flame flattener 16 preferably comprising a casting having an annular flange 17 seated on the flange 9 and a depending flange 18 sleeved within the upper end of the combustion cylinder. The flame flattener extends across the top of the combustion cylinder and has a suitable opening 19 therein for passing the flames to the upper part of the shell.

Threaded into the bowl 11 is a fuel supply pipe 20 having a control valve 21 therein that is operated by a regulating stem 22 extending laterally under the bottom plate 4 and having its outer end rotatably mounted in a bracket 23 depending from the flange 6. The pipe 20 extends in the opposite direction and is supported in a bracket 24 depending from the under side of the plate 4. The outer end of the pipe carries an elbow 25 provided with a nipple 26 that is connected with the outlet of a subtank or pan 27 in which an oil supply tank 28 is inverted. The oil tank 28 is provided with an automatic outlet valve 29 as in conventional oil stove practice, which allows barometric feed of the oil in proportion to the amount flowing through the valve 21 into the combustion cylinder. The subtank is supported on an angle shaped bracket 30 that is fixed to the lower end 31 of an arcuate shield 32. The shield 32 extends upwardly along the side of the shell 2 and protects the supply tank from the effects of the heat generated in the stove. The shield is carried from the shell 2 by means of bracket arms 33 and 34 fixed to the upper and lower ends of a preheater 35.

The preheater 35 includes an arcuate shaped casting having lateral flanges 36 and 37 that are fixed to the side of the shell 2 by means of bolts or other suitable fastening devices to form a vertical duct extending downwardly alongside of the shell and in heating relation therewith. The lower end of the preheater is closed by a horizontal plate 38 to divert air that is drawn through the open upper end for flow through an opening 39 formed in the shell 2 at a point below the division member 8.

The upper end of the stove is provided with an outlet 40 for the spent products of combustion which outlet is connected with a suitable flue or other vent by means of a stovepipe 41. The products of combustion moving through the stove

are retarded by means of a baffle and heat equalizer 42 that is fixed to the inner side of the shell 2 at a point below the flue outlet. The baffle thus provides a tortuous path for the products of combustion before they can flow through the flue outlet, thereby retaining the heat units from escaping to the flue. The shell 2 is provided above and below the division member 8 with inspection and service openings 43 and 44 that are closed by doors 45 and 46 as in conventional practice.

In order to facilitate vaporization of the fuel admitted into the bowl 11, I provide a vaporizer 47 in the form of a baffle having legs 48 for supporting the deflector portion thereof in spaced relation with the oil outlet. The legs are spaced apart to provide outlets for the fuel into the combustion cylinder.

In order to control the amount of unheated air admitted through the inlet openings 5 and thereby regulate ratio of the heated combustion air to the unheated air, the plate 4 is provided with a shutter 49 comprising a ring 50 movably mounted about the periphery of the combustion cylinder and having openings 51 therein registrable with the openings 5. It is obvious that by moving the shutter in an arcuate direction about the combustion cylinder the effective port area of the openings 5 may be regulated to that best suited for supplying the required amount of combustion supporting air.

In using a stove constructed as described, the valve 21 is opened to allow flow of oil from the tank into the bowl 11. The oil is then ignited in the combustion cylinder. A part of the combustion air is admitted through the inlet openings 5 while another part of the combustion air is admitted through the preheater by reason of draft through the stove to the flue outlet. The heated and unheated combustion air, after mixing in the annular chamber 14, passes through the openings in the wall of the combustion cylinder to support combustion of the fuel. After the stove is heated, the portion of the air supply admitted through the inlet openings 5 is regulated to an amount best suited for supporting combustion of the fuel being admitted to the stove.

When it is desired to maintain a high fire, the valve 21 is opened sufficiently wide to provide the proper flame. The side walls of the shell 2 become thoroughly heated and the air flowing through the preheater becomes heated sufficiently hot that when mixed with the unheated air the fuel is readily vaporized and combusted. Should it be desirable to provide a large quantity of combustion supporting air, the shutter may be operated to open the inlets 5, thereby allowing greater draft through the inlet openings 5 and less through the preheater supplying the heated combustion air. If the supply of combustion supporting air is to be reduced the shutter is regulated so as to slightly close off the inlet openings 5.

From the foregoing, it is obvious that I have provided a stove capable of burning fuel oils throughout the full range of burner adjustment, for example from low fire to high fire according to the degree of heat desired. It is also obvious that the stove is of relatively inexpensive and simple construction and may be readily adjusted to efficiently consume any of the lighter grade fuel oils.

What I claim and desire to secure by Letters Patent is:

1. A stove of the character described including a shell, an air chamber in the shell, means

forming an air supply duct in heating relation with the shell and having connection with the air chamber, brackets carried by the supply duct, a guard supported by the brackets, a fuel supply tank carried by the guard and shielded from heating effects of the shell by the guard, a burner in the shell, and means connecting the supply tank with the burner.

2. A stove of the character described including a shell, an air chamber in the shell, means forming an air supply duct in heating relation with the shell and having connection with the air chamber, brackets carried by the air supply duct, a substantially arcuate guard supported by the brackets, a fuel supply tank carried by the guard and shielded from heating effects of the shell by the guard, a burner in the shell, and means connecting the supply tank with the burner.

3. A stove of the character described including a shell, a fire-pot supported in the shell, a perforated combustion chamber cooperating with the bottom of the fire-pot and the shell to form an air chamber circumferentially of the combustion chamber, said shell having an air inlet opening located below the fire-pot and at an elevation near the top of the combustion chamber, a conduit supported in heat conductive relation with the shell for supplying heated combustion air to the air chamber through said opening, means for supplying unheated combustion air circumferentially of the air chamber and below the inlet for the heated combustion air, means for supplying a fluid hydrocarbon fuel to the combustion chamber, and means for regulating the supply of unheated combustion air for controlling draft of air through the conduit supplying heated combustion air to proportion the ratio of said combustion air supplies in the air chamber for controlling the degree of heat generated incidental to combustion of the fuel.

4. A stove of the character described including a shell, a fire-pot in the shell, a cylindrical combustion chamber cooperating with the fire-pot and the shell to form an annular air chamber and having openings connecting the air chamber with the combustion chamber, means closing the bottom of the air chamber and having a circular series of air inlet openings for admitting unheated combustion air to the air chamber, a damper controlling the effective port area of said openings, said shell having an air inlet opening located above the combustion chamber and below the fire-pot, a conduit supported in heat conductive relation with the shell for supplying heated combustion air to the air chamber through said opening, and means for supplying a fluid hydrocarbon fuel to the combustion chamber.

5. A stove of the character described including a shell, a fire-pot having its periphery fixed to the shell and provided with an opening in the bottom of the pot, means closing the bottom of the shell below the fire-pot and having a circular series of air inlet openings for admission of unheated combustion air, a fuel bowl supported by said closure, a combustion chamber having its upper end supported in the opening of the fire-pot and its lower end supported in registering relation with the fuel bowl and provided with perforations through which air is admitted to the combustion chamber, a damper for controlling the effective port area of said unheated combustion air inlet openings, means for admitting a fluid hydrocarbon fuel to the fuel bowl, and means for supplying preheated combustion

air at a point below the fire-pot for mixture with the unheated air.

6. A stove of the character described including a shell, a fire-pot having its periphery fixed to the shell and provided with an opening in the bottom of the pot, means closing the bottom of the shell below the fire-pot and having a circular series of air inlet openings for the admission of unheated combustion air, a fuel bowl supported by said closure, a combustion chamber having its upper end supported in the opening of the fire-pot and its lower end supported in registering relation with the fuel bowl and provided with perforations through which combustion air is admitted to the combustion chamber, a damper for controlling the effective port area of said air inlet openings, means for admitting a fluid hydrocarbon fuel to the fuel bowl, means for supplying preheated combustion air at a point below the fire-pot for mixture with the unheated air, and a flame spreader supported in the fire-pot over the combustion chamber for spreading the flame issuing from the combustion chamber into the fire-pot.

7. A stove of the character described including a shell, a fire-pot having its periphery fixed to the shell and provided with an opening in the bottom of the pot, means closing the bottom of the shell below the fire-pot and having a circular series of air inlet openings for admission of unheated combustion air, a fuel bowl supported by said closure, a combustion chamber having its upper end supported in the opening of the fire-pot and its lower end supported in registering relation with the fuel bowl and provided with perforations through which combustion air is

admitted to the combustion chamber, a damper for controlling the effective port area of said air inlet openings, means for admitting a fluid hydrocarbon fuel to the fuel bowl, means for supplying preheated combustion air at a point below the fire-pot for mixture with the unheated air, a flame spreader supported in the fire-pot over the combustion chamber for spreading the flame issuing from the combustion chamber into the fire-pot, and a vaporizer in the fuel bowl and having a deflector portion for directing vaporized fuel toward the inner periphery of the combustion chamber.

8. A stove of the character described including a shell, an air chamber in the shell, means forming an air supply duct to the air chamber and located in heating relation with the shell, a guard connected with said means forming the air supply duct, a fuel supply tank carried by the guard and shielded from the heating effects of the shell by the guard and the movement of air through said supply duct, a burner in the shell, and means connecting the supply tank with the burner.

9. A stove of the character described including a shell, an air chamber in the shell, an air supply duct connected with the side of the shell for conveying combustion air in heat conductive relation with the shell to the air chamber, and a fuel tank supported from the shell in spaced relation with said supply duct, whereby the tank is protected from the heating effects of the shell incidental to movement of air through said duct to the air chamber.

HIRAM R. WILLSON.