W. H. BOYD.

OIL BURNER.

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1,223,141.

Patented Apr. 17, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

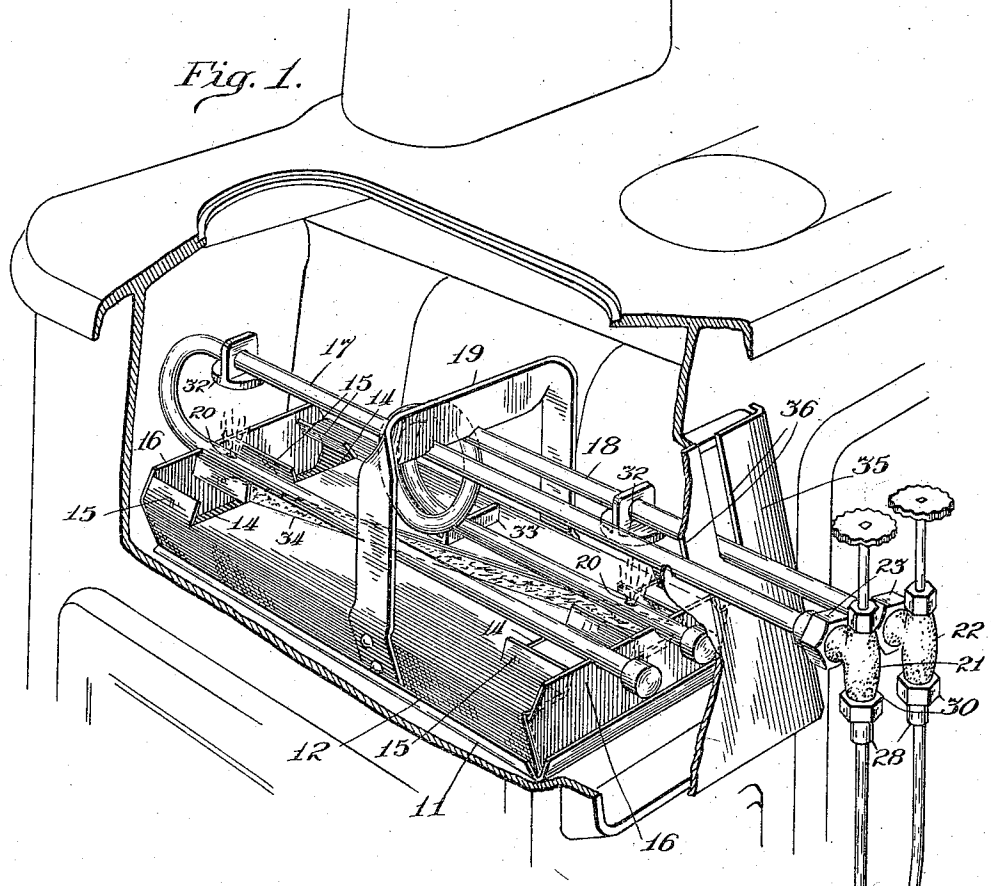
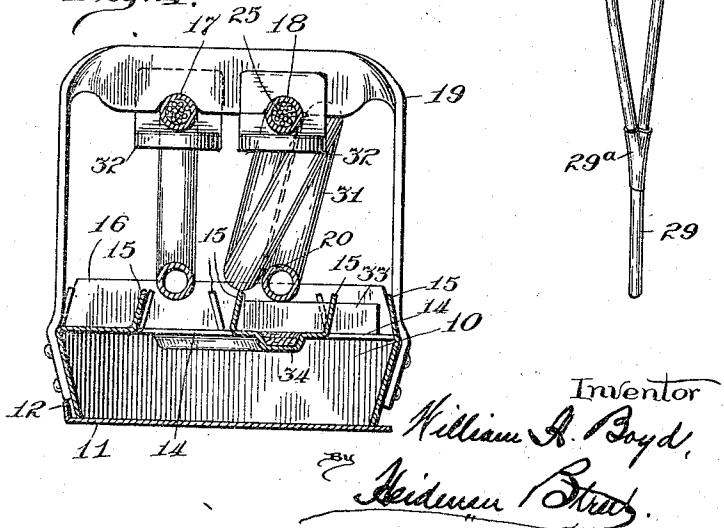


Fig. 4.



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2 SHEETS—SHEET 2.

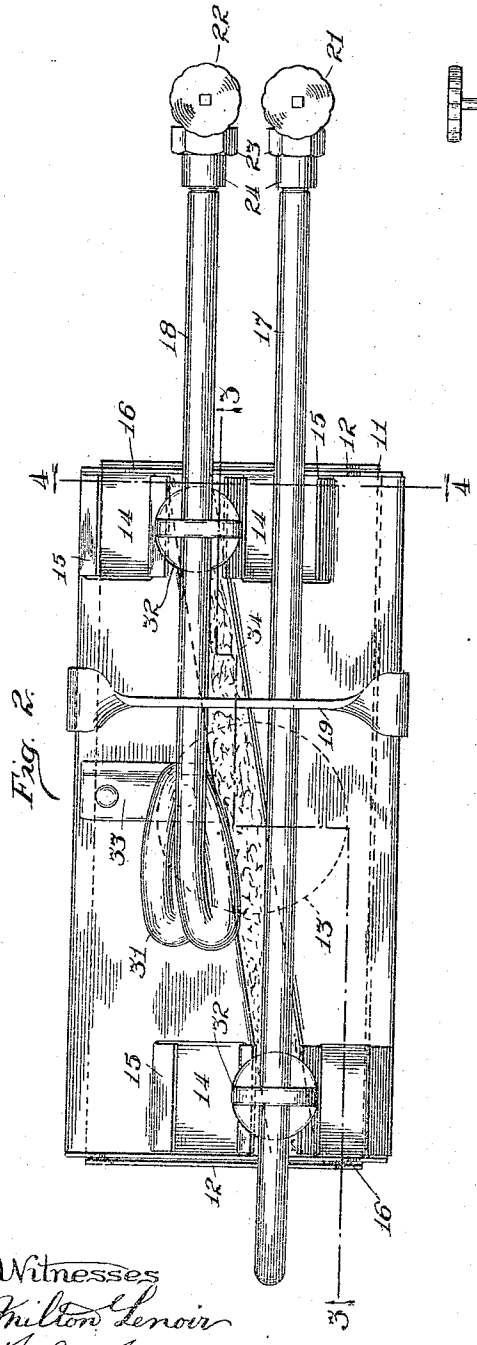


Fig. 2.

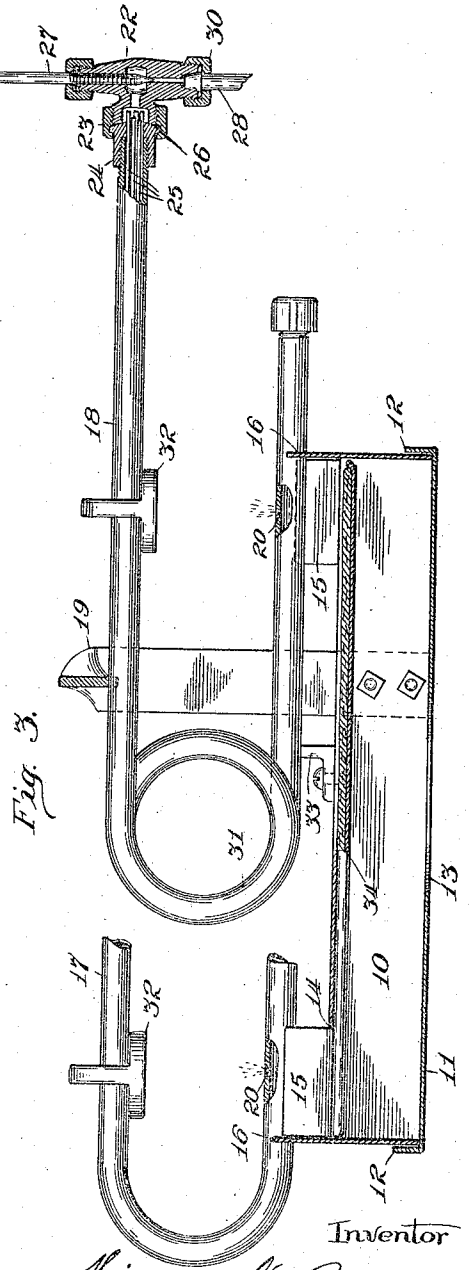


Fig. 3.

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UNITED STATES PATENT OFFICE.

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OIL-BURNER.

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To all whom it may concern:

Be it known that I, WILLIAM H. BOYD, a citizen of the United States, and resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Oil-Burners, of which the following is a description, reference being had to the accompanying drawings, which form a part of my specification.

My invention relates more particularly to burners adapted to be inserted in the firebox of an ordinary coal-burning or wood-burning cook-stove without the necessity of any alteration or change in the stove construction; the device contemplating the use of oil, such as kerosene and the like; the device involving a construction or formation whereby the oil will be suitably generated or vaporized in its passage to the jet-openings of the burner.

The object of my invention is to provide a device of the character hereinafter described with an air-chamber adapted to be seated on the grate of the firebox and having inlet and outlet openings at predetermined points, the air-chamber portion of the device also constituting means for maintaining the generating and burner portions or members in proper position and whereby the assembled device may be readily removed or put into place.

A further object of my invention is to provide means arranged within the generating portion of the burner or device whereby the fuel or oil will be finely divided or "broken up" and generation of the gas enhanced, and whereby the unrefined or viscid matter in the oil will be collected and therefore easily removed from the generator portions of the burners.

My device, in its preferred form, contemplates a plurality of burner-units or sections so arranged that the heat produced when one burner-unit or section is in operation will assist in the generation of gas in the adjacent burner-section; at the same time permitting the various burner-sections or units to be independently operated or disassembled or removed for cleaning, while the adjacent burner-section is in operation.

A further object of my invention is to provide a single supply-pipe provided with ramifications adapted to supply oil from a suitable reservoir or tank to the various burner-sections or units; the supply-pipe being provided with means whereby each burner-section or unit may be independently controlled and the supply of oil thereto shut off.

The objects and advantages herein enumerated, as well as other advantages inherent in the construction, will be readily apparent from the following detailed description of the accompanying drawings, wherein:—

Figure 1 is a perspective view of an ordinary type of cook-stove, with portions broken away, provided with my improved oil burner put into place on the grate of the firebox.

Fig. 2 is a plan view of my improved oil burner.

Fig. 3 is a longitudinal sectional view, taken on the offset line 3—3 of Fig. 2, looking in the direction of the arrows.

Fig. 4 is a cross-sectional view, taken on the line 4—4 of Fig. 2, looking in the direction of the arrows.

In the particular exemplification of my device, as disclosed in the drawings, 10 constitutes an air-chamber provided with a bottom 11, preferably removable. The bottom 11 is shown provided with an engaging or attaching flange 12, whereby the proper positioning of the bottom 11, relative to the upper or body portion of the air-chamber, is determined. The bottom 11, which is intended to rest on the grate of the firebox, is provided with a central opening 13 for the ingress of air into the air-chamber 10.

The top wall of the air-chamber is provided with openings 14, preferably arranged in pairs at opposite ends of the air-chamber. The sides of the openings 14 are preferably provided with the upwardly sloping walls or deflectors 15, which are arranged to deflect the air toward the burner-units or sections hereinafter described, as more clearly shown in Fig. 1.

The air-chamber 10 is preferably formed of sheet metal, with the sides bent downwardly and resting on the bottom member 11; while the deflectors 15 may be formed by slitting the sheet at the points where the air-openings or passages are intended to be and the portions adjacent the slits bent upward as shown in the drawings.

The end walls of the air-chamber are extended above the top of the air-chamber, as disclosed at 16, 16, in order to provide sup-

ports for the generating and burner-pipes. The upwardly presented ends 16, 16 are preferably provided with notches to receive the combined generator and burner-sections or units 17 and 18. The air-chamber portion 10 is shown provided with a bail or yoke 19 firmly secured to the sides of the air-chamber so as to remain in upright position. The yoke 19 has the laterally disposed portion thereof provided with notches for the passage of the generator and burner-sections or units and maintains the proper relative position of the units 17 and 18. The upper leg or portion of each pipe 17 and 18 constitutes the generating portion while the lower leg constitutes the burner-portion; the latter being provided with a suitable jet-opening 20 where the vapor or gas is ignited. Both legs or portions of the pipe are preferably arranged in substantially the same vertical plane, namely with the generating portion arranged directly above the burner-portion of the sections or units, so that the heat resulting from the flame at the jet-opening 20 will come into contact with and encircle the upper leg or generating portion of each section or unit.

The ends of the burner-portions of the units or sections are provided with suitable closures, as clearly shown in Fig. 1; while the generator portions of the units or sections are connected to the outlet ends of the valve-members 21, 22; the connections being formed by suitable unions 23, see Fig. 3, which engage with the threaded hub-portion of the valve members and with the thimble or nipple 24 secured to the ends of the generator-portions of the respective burner-units or sections.

In order to effect a liquid-tight connection between the nipple 24 and the valve, I prefer to provide the valve with a countersunk or depressed surface adapted to receive the conical surface or end of the nipple 24, as shown at 26, in Fig. 3.

The generator-portions of the different sections or units are preferably provided with a number of thin wires 25, see Figs. 3 and 4. The wires 25 preferably extend throughout the entire straight length of the generator-portion of the burner-units; namely in the burner-section or unit 17, the wires 25 preferably extend from the nipple end of the generator-portion to the point where the pipe bends into the burner-portion; while in the burner-unit or section 18 the wires extend from the nipple 24 to the point where the leg is coiled. The wires 25 are preferably made of steel and copper covered, so as to greatly increase the heat conductivity thereof. These wires not only tend to break up the oil into finely divided particles and assist in the generation of the vapor, but they also tend to gather or collect unrefined or viscid matter in the oil.

The viscid or gummy substance in the oil will adhere to the wires; this may be easily removed by withdrawing the wires from the generator-portions which may be accomplished by unscrewing the unions 23. The wires can then be wiped or cleaned and replaced, and the unions 23 screwed back into place.

The end of the valve-stem 27 is tapered so as to provide a needle-valve, as shown in Fig. 3, extending into the inlet end of the valve, thereby permitting regulation of the flow of oil. The inlet end of the valves 21 and 22 are counterbored or enlarged to receive the tapered bushings or nipples 28 secured to the ramifications of the supply-tube 29; the nipples on the ramified end of the supply-tube being firmly held in place by means of the unions 30 which are adapted to have threaded connection with the body of the valves 21 and 22, as shown in Fig. 3.

The supply-pipe 29 is shown provided with a Y-connection 29^a which receives the ramifications leading to the respective valves 21 and 22, thus enabling a single feed line or pipe to be employed for supplying oil to the different burner-units or sections.

In order to provide a generator-portion of as great length as possible, I show the rear or short burner unit 18, with one or more coils or turns 31, so as to insure a complete vaporization of the oil by the time it reaches the jet-opening 20 in the burner-portion of the unit 18. If desired, both burner-sections or units may be provided with one or more coils, although the front or long burner-unit 17, it has been found in practice, by reason of the straight length of the generator portion, will give the desired result without an additional coil or turn.

In order to properly spread the flames, and at the same time prevent the flame from playing directly on the generator-portion of the respective burner-units, I provide spreaders 32, 32. The lower portion of the spreaders are preferably in the nature of a disk while the securing portion extends at a right angle therefrom and has an opening to adapt it to slide onto the generator-portion of the burner-units. The construction of the spreaders is such that they may be swung on the pipes to any desired angle and thereby direct the flame toward one side or the other as the case may be.

In order to provide a proper support for the inner end of the short burner-unit 18, I provide the top of the air-chamber 10 with a supporting bracket 33, shown in the nature of an angle-iron which is secured to the top wall of the air-chamber while the upstanding portion or leg is preferably provided with a notch for the reception of the burner-unit.

The top of the air-chamber is also pro-

vided with a shallow channel or groove 34, arranged in the diagonal manner shown in Figs. 1 and 2, so as to come beneath the part of the burner-portions provided with the jet-openings 20, 20; the ends of the channel are arranged intermediate of the pair of air outlets 14 at the respective ends of the air-chamber.

This channel or groove 34 may be filled with asbestos fiber or other suitable substance which is intended to be saturated with oil for the initial generation of the vapor. When it is desired to start the burner, the valves 21 and 22, one or both, may be turned on and the cold oil allowed to issue from the jet-openings 20, 20 and permitted to drip into the channel and onto the fiber, where the same may be ignited and allowed to burn until the pipes 17 and 18, either one or both, become sufficiently hot to cause generation.

As is evident from the construction, the heat resulting when either burner-unit or section is in operation will be sufficient to caues generation in the adjacent burner-unit or section; and the flame of either one or both burner-units may be directed toward the front or rear side of the stove by simply tilting the spreaders 32 upward toward that side.

With my construction, all of the air coming upward through the grate of the firebox is caused to enter the air-chamber 10 through the inlet-opening 13 in the bottom member 11, and is discharged on opposite sides of the jet-openings through the outlet-openings 14, 14; the deflectors 15 causing the air to flow toward the top side of the burner-portion of the respective burner-units.

It has been found in practice that if the air currents are not directed and restricted but allowed to freely rise upward about the burner-units and immediately the jet-openings thereof, a very undesirable burner is obtained, having less heating power and producing a very undesirable noise. These serious objections are, however, entirely eliminated with my improved construction.

In installing my improved burner, the usual door to the firebox of the stove is removed and the bottom member 11 put into place, so as to practically cover the entire grate area of the firebox, the assembled burner and air-chamber put into place on the bottom member 11; the proper positioning of the device being determined by the flanged sides of the bottom member 11 as previously described.

The door-opening is then provided with the cover member 35, composed of suitable sheet metal and provided with cut-out portions or slots 36, 36 of suitable length, so that the member 35 may be slid over the burner to close the door-opening of the stove, while at the same time permitting the member 35 to be readily removed when desired.

I have shown my improved burner provided with two units or sections, but it will be readily understood that any number of burner-units or sections may be employed, and that the device may be altered in certain details of construction without, however, departing from the spirit of my invention.

What I claim is:—

1. A burner of the class described, comprising a burner-unit, the upper portion or leg whereof constitutes a generator-portion while the lower leg constitutes a burner-portion and is provided with a jet-opening, an inclosed air-chamber provided with upwardly extending end walls having notches in which the burner-unit is mounted, the air-chamber being provided with an air-inlet in the bottom and with air-outlets in the top, the air-outlets in the top being arranged on opposite sides of the burner-portion and provided with upwardly presented deflecting walls adapted to direct the air-currents toward the jet-opening of the burner-portion, and a yoke member secured to the sides of the air-chamber and extending transversely thereof across the burner-unit so as to maintain the latter in position on the end walls of the air-chamber.

2. A burner of the class described, comprising an inclosed air-chamber, the bottom whereof is provided with an air-inlet at an intermediate point while the top is provided with a plurality of air-outlets arranged in pairs at opposite ends of said air-chamber, a pair of burner-units mounted on said air-chamber in spaced relation with the top wall thereof, said burner-units having their burner-portions arranged at opposite ends of the air-chamber and intermediate of the pair of air-outlets at the respective ends, upwardly presented deflectors adjacent the air-outlets whereby the outflowing air is deflected toward the burner-portions, and means secured to the sides of the air-chamber and extending transversely thereof in spaced relation with the top wall of said air-chamber, said means being provided with recesses for the reception of the generating-portions of the burner-units whereby the latter are removably held on the air-chamber.

3. A burner of the class described, comprising a plurality of adjacently arranged burner-units, an inclosed air-chamber on which the burner-units are mounted, the bottom of the air-chamber being provided with an air-inlet at an intermediate point while the top is provided with a plurality of air-outlets arranged on opposite sides of the burner-portions of said units, the top

wall of the air-chamber being provided with an oil-receiving channel extending diagonally from end to end of the chamber beneath the parallelly arranged burner-units, and means secured to the air-chamber and extending across the burner-units whereby the latter is removably held in position.

4. A burner of the class described, comprising a base-portion formed to provide an air-chamber and provided with a bottom having an air-inlet at an intermediate point while the top is provided with air-outlets arranged in pairs at opposite ends of the base-portion, the end walls of said base-portion being extended above the top to constitute end walls for the air-outlets and provide burner-supports, a pair of burners arranged parallel with each other and supported by said end walls in spaced relation with the top of said base-portion, and means secured to said base-portion and extending across the burners whereby the latter are removably held in position on said end walls.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."