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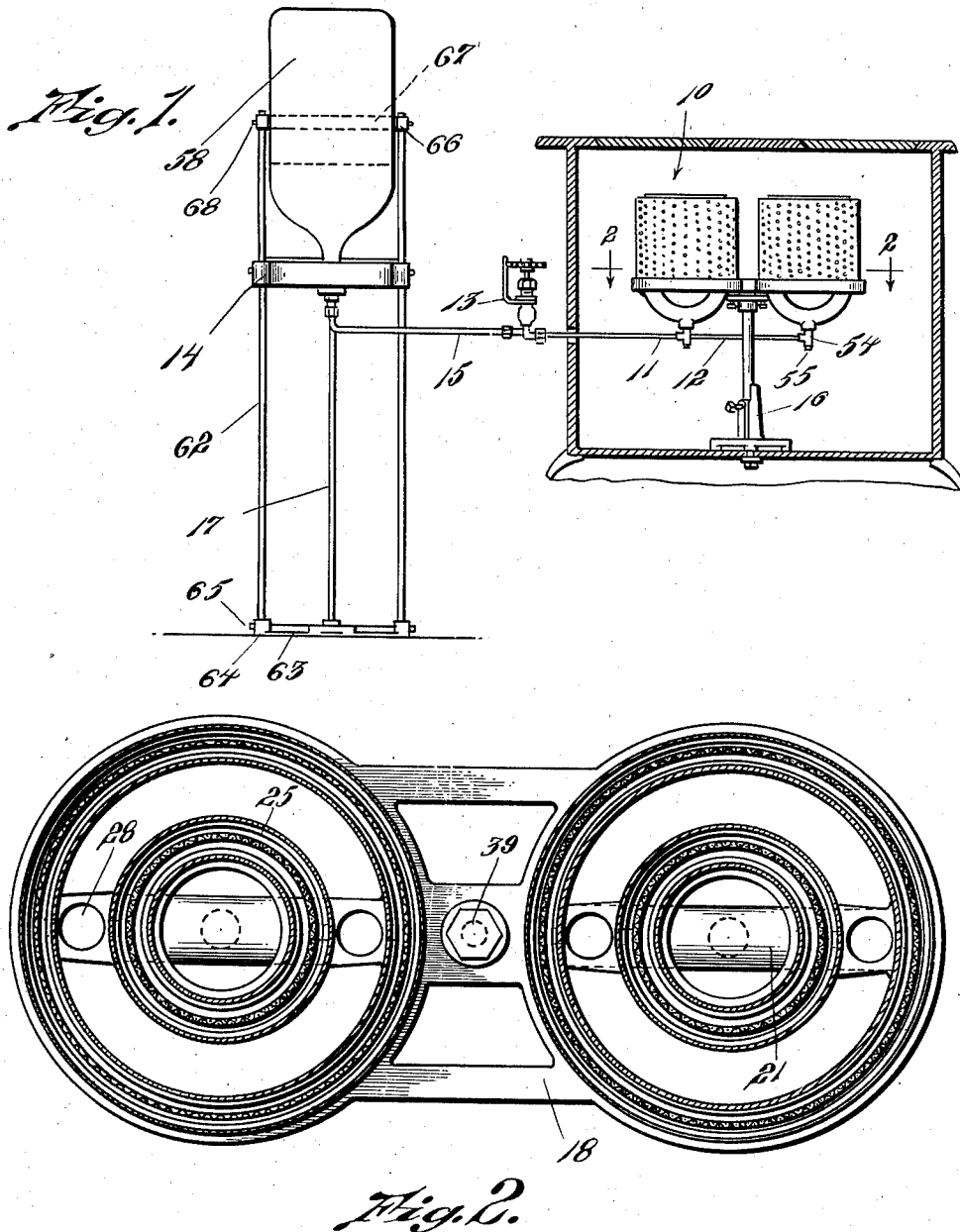
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2,123,085

OIL BURNER SYSTEM

Original Filed Nov. 15, 1930

3 Sheets-Sheet 1



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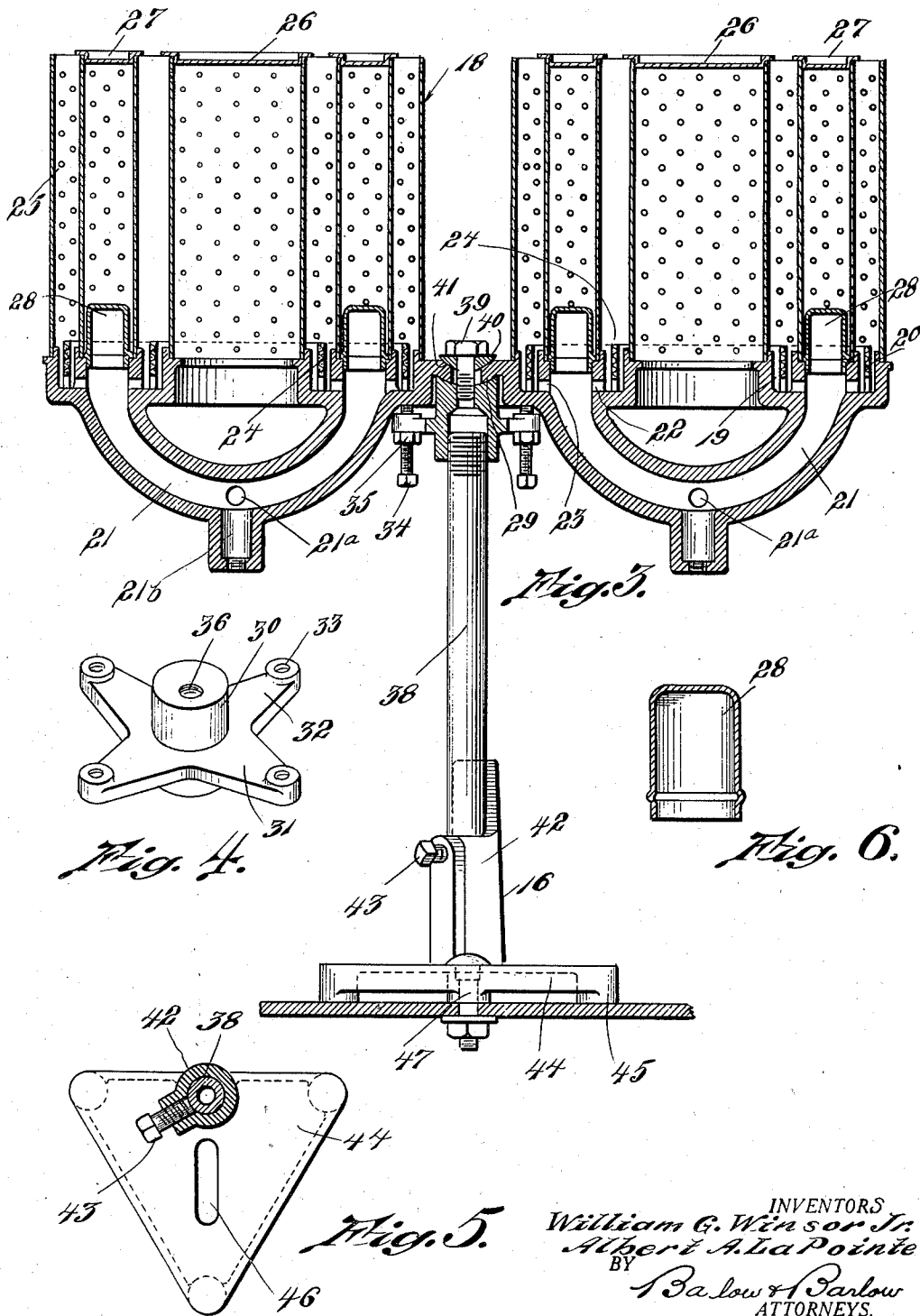
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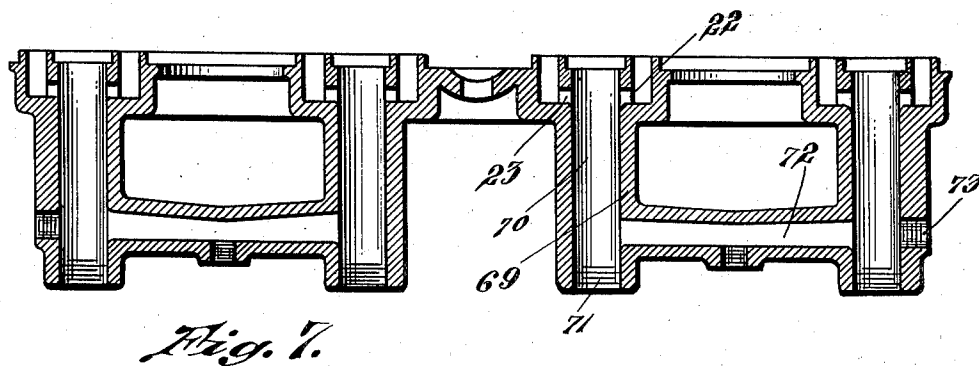
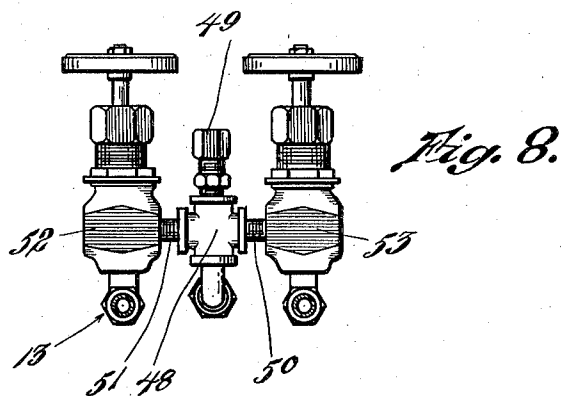
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UNITED STATES PATENT OFFICE

2,123,085

OIL BURNER SYSTEM

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by direct and mesne assignments, to Sunshine
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Renewed December 14, 1934

13 Claims. (Cl. 158—87)

The present invention relates to oil burners, and has particular reference to oil burners suitable for ranges, stoves, and small heaters, and an object of the invention is to provide a vaporizing chamber below the fuel grooves.

It has been found that oil burners of this type require frequent cleaning, as carbon readily forms in the burner vaporizing chamber during the initial burning. This necessity for frequent cleaning detracts from the usefulness of the burner, and requires care in replacement of the burner parts after cleaning, in order to ensure proper alignment.

One object of the invention is to provide a burner construction which will minimize carbon formation, and which may be readily removed for inspection and cleaning if necessary, and may be instantly replaced in self-aligning position.

Another difficulty found in oil burners of this type has resulted from the usual construction of feeding the outer burner groove from the inner burner groove, thus producing an uneven flow of oil vapor to the outer burner, and interfering with proper burner operation when set for a low flame. Additional objects of the invention are therefore to construct a burner which will feed the oil vapor to each of the burner grooves at the same rate, thus producing a steady burning adjustable to any degree of intensity.

Since the proper operation and functioning of a burner of this type depends on the proper working and coordination of all the parts thereof, further objects of the invention include the design of easily controlled flow valves, of a bottle bowl having ample capacity to eliminate oil overflow due to air expansion, of a bottle stand that is sturdy and rugged, and of other parts that fulfill their intended purpose in the best possible manner.

The invention therefore consists of a novel arrangement of parts more fully disclosed in the detailed description following, in conjunction with the accompanying drawings, and more particularly defined in the claims appended thereto.

In the drawings:

Fig. 1 is an elevation of a general burner arrangement suitable for a stove range, the stove being shown in section;

Fig. 2 is a section through the burner on the line 2—2 of Figure 1;

Fig. 3 is an enlarged vertical section through the burner;

Fig. 4 is a perspective detail of the burner seat;

Fig. 5 is a plan view, partly in section, of the burner stand;

Fig. 6 is a section through an equalizing thimble;

Fig. 7 is a central vertical section through a modified form of burner;

Fig. 8 is an elevational detail of the double valve structure.

Referring to Figure 1 of the drawings, the burner 10 is supplied with burner oil through pipes 11, 12, a double valve 13 receiving the oil from a supply bowl 14 through a pipe 15 and controlling the feed through the pipes 11, 12. The burner 10 is adjustably mounted on a support stand 16, and the supply bowl 14 is adjustably mounted on a support stand 17.

The burner construction is clearly shown in Figures 2 to 6, and includes a base 18 which is preferably of cast metal, but which may be of pressed metal if desired. The base 18 may support one or more burner units, the preferred number for range stove use being two; each burner unit has the usual inner fuel groove 19 and outer fuel groove 20, but instead of a fuel supply from a vaporizer to the inner groove only, the fuel supply is led to each groove by utilizing a low U-shaped vaporizer 21 which has its outlets between the grooves and communicating with the grooves through ports 22 and 23 respectively, and having an inlet 21a and a depending clean-out 21b. Each groove has the usual asbestos wick 24 therein, and has the usual foraminated shells 25, the cover plate 26 and annular cover ring 27 closing the upper portions of the air passageways in the usual manner.

The upper ends of the vaporizer 21 are closed by a metal thimble or the like 28, shown in section in Figure 6, this metal thimble serving as an expansion chamber for the vapor generated in the vaporizer. The thimble, in certain instances, may have an opening or vent in the upper wall thereof. The thimbles are preferably frictionally held in the upper ends of the vaporizer; and may be readily removed to permit passage of a cleaning tool or brush through the vaporizer.

The center portion of the base is formed as a support element 29, and is rounded so as to universally engage the correspondingly rounded top 30 of a support bracket 31. The support bracket has a plurality of radiating arms 32 with threaded bores 33 for receiving adjusting bolts 34 which are provided with the usual lock nuts 35 and engage portions of the base bottom. The bracket has a central threaded opening 36 in the top thereof, and a larger threaded bore 37 at the other end, the bore 37 being adapted to thread on a correspondingly threaded standard 38, and the

opening 36 receiving a lock bolt 39 which presses a lock washer 40 into a spherical recess 41 at the upper end of the support element 29.

The standard 38 is adjustably held in the stand 16, which has a vertical tubular holder 42 for receiving the standard, and a lock screw 43 passing through the holder for clamping the standard in adjusted position. The stand 16 has a base 44, preferably triangular in form, with support legs 45 and a central slot 46 through which a lock bolt 47 may be passed to lock the base to the floor of the stove range or heater.

Referring now to Figures 1 and 8, the valve mechanism includes a double valve element 13, receiving oil from the conduit 15 in a central T or fitting 48, which has an upper connection 49 for a vent or as a supplemental inlet, and two outlets 50, 51, which lead to the needle valves 52, 53. The fitting and its connections are preferably made integral. These needle valves may be of any approved type, but preferably are of the lock adjustment type equipped with a toothed control wheel and a spring finger lock. The pipes 11, 12 receive the oil from the needle valves and conduct the oil to the vaporizing chambers 21 through connecting nipples 54, which preferably are of the one piece type and have a clean-out 55 at the lower end thereof.

Instead of utilizing a burner base with arcuate vaporizing chambers such as 21, the burner base may be formed as shown in Figure 7, with vaporizing chambers 69 having straight side passages 70; this construction permits each side passage to be drilled and threaded at the lower end 71, and one side to be drilled and threaded in alignment with the center passage 72, as at 73, for the reception of clean-out plugs, not shown. The center passage is preferably inclined, as illustrated, to facilitate upward flow of the vapor. The passages are therefore easily cleaned whenever cleaning appears desirable. Both constructions of vaporizing chambers have rounded or sloped corners adjacent the groove communicating ports 23, 24, so as to minimize carbon deposition.

The operation of the improved burner may now be described:

The filled oil bottle being mounted in the bottle bowl, the oil reservoir becomes filled to the proper level, in the usual manner, and the oil feeds through the adjusted and set valve unit to the U-shaped vaporizers. As soon as burning has started, vaporization of the oil starts in the U-shaped vaporizers and when the device becomes heated fully the vaporization takes place in the lower portion of these U-shaped vaporizers well below the level of the base in which the grooves are formed, and the vapor simultaneously passes to the inner and outer grooves of each burner unit, thus permitting a free burning of the oil and an exact regulation of the height of the flame. The expansion chambers smooth out the vapor surges and ensure an even flow of the oil vapor. The burner base, when initially installed, had been carefully aligned by means of the four adjusting screws; if the base is removed by taking out the center holding bolt, for cleaning or any other purpose, it aligns itself as soon as reset on the bracelet top.

While a specific constructional embodiment of the invention has been described, such changes in form, in size, and in proportions as are deemed desirable for different installations may be made, without departure from the spirit and the scope

of the invention as defined in the appended claims.

We claim:

1. In an oil burner, an oil burner base having spaced concentric grooves, foraminated cylinders mounted concentric with said grooves and defining flame passageways, a fuel vaporizing chamber terminating at diametrically opposite points between said grooves, means for conducting vapor from said chamber in oppositely directed streams to said grooves, an expansion chamber communicating with said vaporizing chamber and above said means for conducting vapor to said grooves, and means for conducting fuel to said vaporizing chamber.

2. In an oil burner, an oil burner base having spaced concentric grooves, foraminated cylinders mounted concentric with said grooves and defining flame passageways, a U-shaped fuel vaporizing chamber terminating between said grooves, means establishing communication between the upper ends of the chamber and said grooves, and means for conducting fuel to said vaporizing chamber.

3. In an oil burner, an oil burner base having spaced concentric grooves, foraminated cylinders mounted concentric with said grooves and defining flame passageways, a U-shaped fuel vaporizing chamber terminating between said grooves, means establishing communication between the upper ends of the chamber and each of said grooves separately, and means for conducting fuel to said vaporizing chamber.

4. In an oil burner, an oil burner base having spaced concentric grooves, foraminated cylinders mounted concentric with said grooves and defining flame passageways, a U-shaped fuel vaporizing chamber, expansion chambers at the upper ends thereof, means connecting the upper ends of the chamber with said grooves, and means for conducting fuel to said vaporizing chamber.

5. In an oil burner, an oil burner base having spaced concentric grooves, foraminated cylinders mounted concentric with said grooves and defining flame passageways, a U-shaped fuel vaporizing chamber, expansion chambers at the upper ends thereof, means connecting the upper ends of the chamber separately with each of said grooves, and means for conducting fuel to said vaporizing chamber.

6. An oil burner base having spaced concentric grooves and a depending U-shaped vaporizing chamber having spaced upper ends positioned intermediate said grooves and provided with inwardly and outwardly directed openings freely communicating with both grooves, and means for conducting fuel to said vaporizing chamber.

7. An oil burner base including a supporting rest with branch arms, each arm supporting a burner, each burner having spaced concentric grooves and a depending U-shaped vaporizing chamber with spaced upper ends positioned intermediate said grooves and provided with inwardly and outwardly directed openings freely communicating with both grooves, and means for conducting fuel to said vaporizing chamber.

8. In an oil burner, an oil burner base having spaced concentric grooves, foraminated cylinders mounted concentric with said grooves and defining flame passageways, a fuel vaporizing chamber positioned at a point below the level of said grooves and spanning the distance between diametrically opposite portions of the inner of said grooves, means for conducting vapor from said chamber to a point between said grooves and

thence inwardly and outwardly into each of said grooves, and means for conducting fuel to said vaporizing chamber.

5 9. In an oil burner, an oil burner base having spaced concentric grooves, foraminated cylinders mounted concentric with said grooves and defining flame passageways, a fuel vaporizing chamber positioned below the horizontal level of said grooves and vertically below one of said grooves and terminating between said grooves, means for conducting vapor from said chamber independently to each of said grooves, and means for conducting fuel to said vaporizing chamber.

10 10. In an oil burner, an oil burner base having spaced concentric grooves, foraminated cylinders mounted concentric with said grooves and defining flame passageways, a fuel vaporizing chamber positioned below the horizontal level of said grooves and vertically below the inner groove and terminating at diametrically opposite points between said grooves, means for conducting vapor from said chamber in oppositely directed streams to said grooves, and means for conducting fuel to said vaporizing chamber.

15 11. An oil burner comprising means forming a pair of spaced concentric annular fuel grooves, walls certain of which are perforated forming annular combustion chambers above and in communication with the grooves, substantially radial passages connecting the grooves, each passage having a bottom wall provided with an opening therethrough located between the fuel grooves, a central vaporizing means, fuel delivery passages

extending outwardly from the vaporizing means to the openings, and means to deliver oil to the vaporizing means.

12. An oil burner comprising means forming a pair of spaced concentric annular fuel grooves, walls certain of which are perforated forming annular combustion chambers above and in communication with the grooves, substantially radial passages connecting the grooves, each passage having a bottom wall provided with an opening therethrough located between the fuel grooves, a central vaporizing means, fuel delivery passages extending substantially radially outward from the vaporizing means, the fuel delivery passages being located beneath the first mentioned passages and having their outer ends connected to the openings, and means to deliver oil to the vaporizing means.

13. As an article of manufacture, an oil burner base comprising means forming a pair of spaced concentric annular fuel grooves connected by substantially radial passages, each passage having a bottom wall provided with an opening therethrough located between the fuel grooves, a central vaporizing chamber having an inlet for the supply of oil thereto, and fuel delivery passages extending substantially radially outward from the vaporizing chamber, the fuel delivery passages being located beneath the first mentioned passages and having their outer ends connected to the openings.

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