Feb. 26, 1924. 1,484,623

W. C. COLEMAN

OIL BURNER

Filed March 24, 1922 2 Sheets-Sheet 1

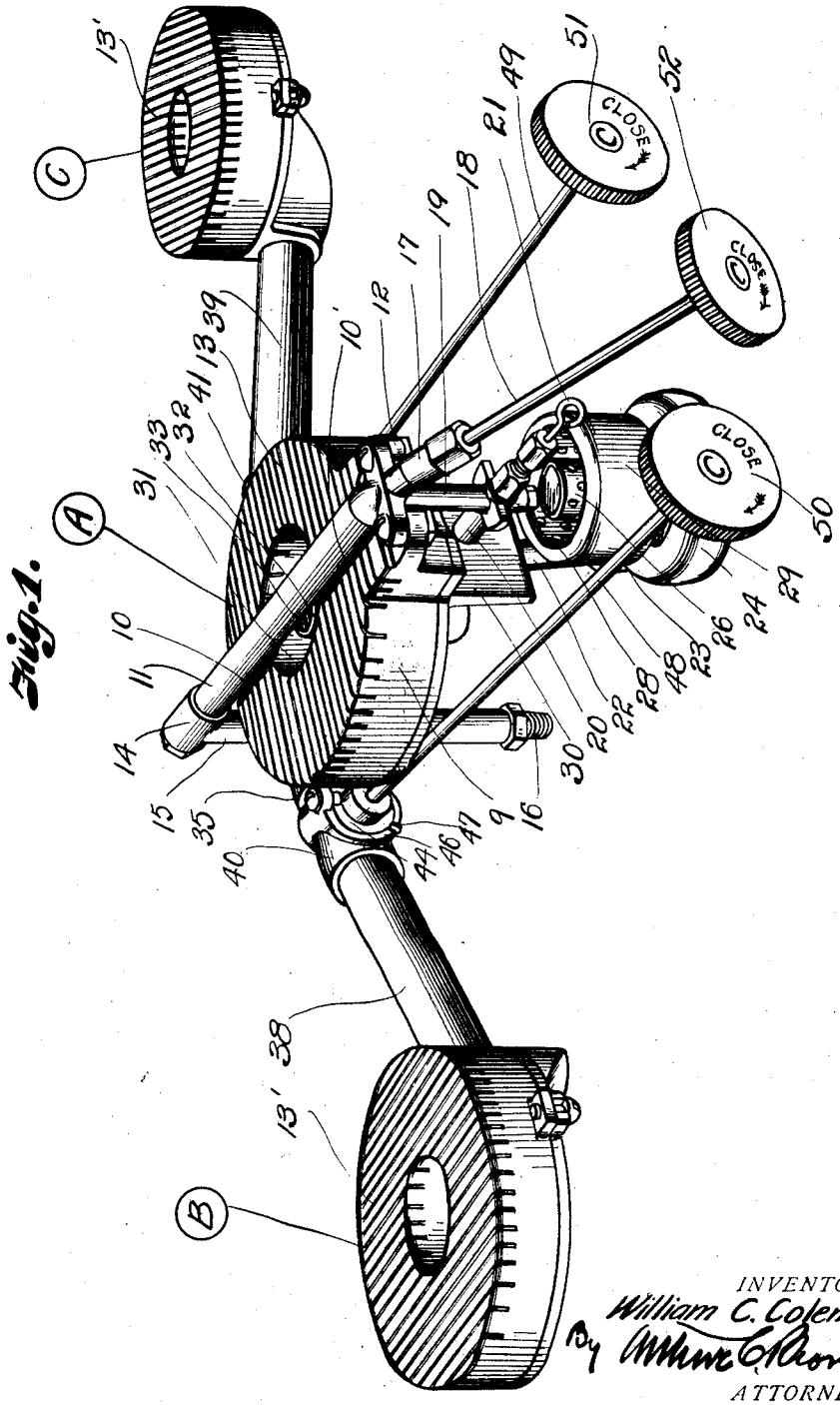

Fig. 1.

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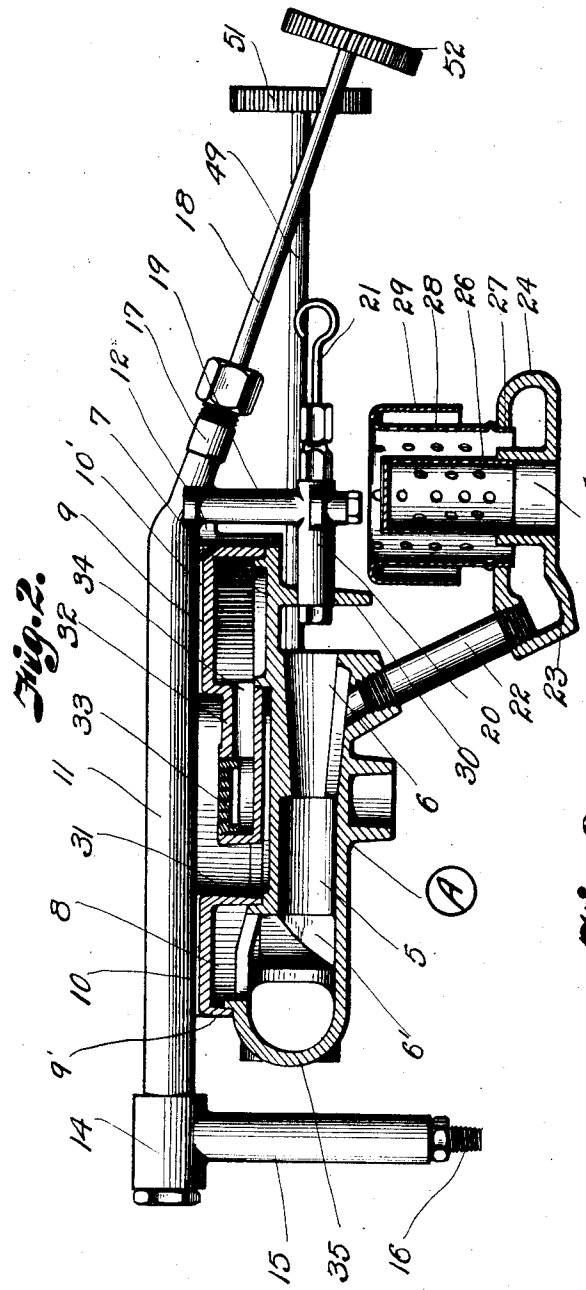

Fig. 2.

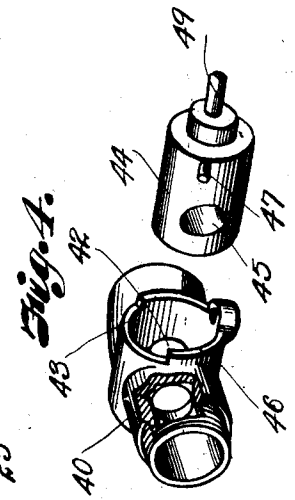

Fig. 4.

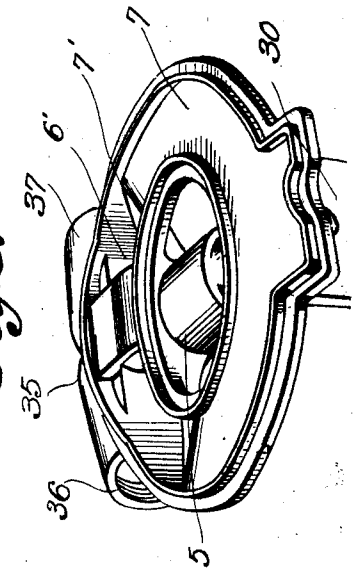

Fig. 3.

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Patented Feb. 26, 1924. 1,484,623

UNITED STATES PATENT OFFICE.

WILLIAM C. COLEMAN, OF WICHITA, KANSAS.

OIL BURNER.

Application filed March 24, 1922. Serial No. 546,299.

To all whom it may concern:

Be it known that I, WILLIAM C. COLEMAN, a citizen of the United States, residing at Wichita, in the county of Sedgwick and State of Kansas, have invented certain new and useful Improvements in Oil Burners; and I do declare the following to be a full, clear, and exact description of the invention such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to hydrocarbon fuel burners and particularly to a burner for converting fuel oil into heat.

One of the objects is to provide means whereby the fuel oil can be converted from the liquid phase to the gaseous or vapor phase in a master burner which may be controlled to operate alone so that it will supply heat or which may be used as a service generator from which the vaporized fuel may be distributed to complementary burners devoid of generators.

This is an important advance in the art because in so far as I am aware, it has been the usual practice to provide each hydrocarbon burner with a generator; each burner individually converting the fuel from the liquid phase to the vapor or gaseous phase. Therefore, it has hitherto been considered necessary to provide a generator for each burner.

I have found, however, that it is wholly practicable to convert the fuel from the liquid phase to the vapor or gaseous phase from a central or master burner and distribute the gas or vapor to additional burners.

Of course, the construction contemplated by my invention does not apprehend those complicated gasifying plants where gas is made at central stations and distributed throughout lighting systems, but it is more particularly applied to what is commonly known as oil stoves where the burners are set in a frame to render them effective for domestic purposes, such as cooking and the like.

The novel arrangement of the parts and combinations of parts by which one form of my invention may be carried out will be apparent by reference to the following description in connection with the accompanying drawings, in which—

Fig. 1 is a perspective view of a combined generator and burner, which I will hereinafter designate a master burner, and two complementary burners communicating with the mixing chamber thereof.

Fig. 2 is a view partly in side elevation and partly in section of the master burner constructed in accordance with my invention.

Fig. 3 is a perspective view of the bottom of the generating portion of the master burner, and

Fig. 4 is a perspective view of the valve casing and one of the valves for the connecting ports of the auxiliary burners, the valve being shown as detached from the casing.

Referring now to the drawings by numerals of reference:

A designates the master burner and B and C are the two auxiliary or supply burners which receive the fuel in a properly generated, mixed condition from the master burner A. The specific construction of the master burner A is not so material to the successful operation of the invention herein contemplates, it being important, however, that the master burner have means for properly generating the fuel charge from a liquid phase to a gaseous or vapor phase and that it have sufficient capacity to not only take care of its own requirements but also be able to take care of the requirements of the maximum number of auxiliary or supply burners communicating therewith.

I have specifically described the construction of the generating mechanism of the master burner in an application filed by me on or about June 17, 1921, Serial No. 478,311, and in that application are claims drawn to the specific construction of the generating mechanism; this application contemplating the broad conception of a self-generating fuel burner in combination with complementary burners which receive their fuel from the self-generating burner, the auxiliary burners being so connected to the self-generating burner that they do not require any individual means for treating the fuel prior to ignition.

The self-generating or master burner A is shown as comprising a block having a hollow portion 5 constituting a subjacent chamber for the mixture consisting of the hydro-

carbon and air. The hollow portion is provided with a conical inlet 6 and an outlet 6′ discharging through the port 6′ above the annulus or ring 7 into a circumferential chamber 8.

The ring 7 merges into the port 6′, as shown at 7′ (Fig. 3) and it constitutes the floor for the chamber 8 formed by the annulus 7 and the annular cap or top plate 9, which has a circumferential flange 9′ resting upon the floor or ring 7.

The cap 9 has diametrically oppositely located grooves or depressions 10 and 10′ to receive the tubular, gasifying chamber 11, which may be supplied with fuel in the liquid phase to be converted into fuel in the gaseous phase, as will be explained hereinafter.

The chamber 11 is fastened to a lug or projection 12 on the cap 9 in any preferred manner so that the chamber 11 will be held in position to be subjected to the heat when the gas issuing through the burner slots 13 is ignited.

It will be observed that these slots 13 are substantially equi-distant apart or in parallelism and that the flame not only serves for industrial purposes but will also heat the vaporizing chamber 11 to a sufficient temperature to vaporize the incoming hydrocarbon fuel, entering at the inlet 14 through the port 15, provided with a nipple 16 which may be attached to any suitable pipe line leading from a liquid reservoir. The discharge end of the vaporizing tube 11 is provided with a needle valve casing 17, in which is a needle valve 18 of appropriate construction to shut off communication between the vaporizing chamber 11 and the depending port 19, which communicates with it. The lower end of the depending port 19 is provided with a discharge nozzle 20 at right angles thereto but in line with the conical opening 6, the effective port area of the nozzle being controlled by a reciprocatory stem 21, on which is a needle valve, as will be well understood.

The stem 21 has frictional engagement with its case or nozzle 20 so that it may be moved to closing position or opening position in a simple and expeditious manner. No particular novelty is claimed for this type of valve control, however, as it is obvious that the device would be also effective if used with the ordinary threaded needle valve.

Depending from the wall of the conical orifice 6 is a pipe or port 22, communicating with a hydrocarbon oil chamber 23, which it supports. The chamber consists of a hollow casing 24, the lower wall of which is provided with a central opening 25 supporting an upstanding perforate tubular member 26, which extends through a larger opening 27 in the top wall of the chamber 24. The edge of the larger opening supports a spaced tubular perforate casing 28, parallel with the tube 27 and having a depending bonnet or protective wall 29, the top of the perforate sleeve 28 extending beyond the upper end of the tubular member 26 and terminating adjacent to the nozzle 20, held in alignment with the conical opening 6 by the lug 30, depending from the floor or annulus 7.

When it is desired to use the burner A, hydrocarbon fuel, such as gasoline, will be admitted into the vaporizing chamber 11 in a liquid state and by unseating the valve 18, the hydrocarbon fuel will gravitate into the tubular portion 19 through the nozzle 20 into the conical inlet 5 through the tubular pipe 27, which constitutes both the conduit and the bracket for the casing 24, and into the chamber 23, air being supplied through the opening 25 so that the liquid hydrocarbon can be ignited at the pilot burner consisting of the casing 24 and its appurtenances, the heat therefrom sufficiently heating the primary vaporizing chamber or nozzle 20 so that the oil or hydrocarbon fuel entering the same will be discharged into the conical opening 5 and into the chamber 8 to be ignited through the slots 13, it being understood that after the hydrocarbon fuel begins to vaporize, it will first gravitate through the port 22.

After the hydrocarbon fuel has reached the vapor stage so as to burn through 13, the heat therefrom will be sufficient to vaporize the fuel in the chamber 11 so that it will be in the form of vapor before it reaches the nozzle 20, consequently, the necessity for the utilization of the pilot burner after the fuel has become sufficiently vaporized will be eliminated. Instead of the fuel gravitating from the pipe 22, it will pass directly through the chamber 5, through port 6, up through the floor 7 into the annular chamber 8 and through the slots 13. In other words, as soon as the device is properly operating, the pipe 22, the casing or casting 24 and its appurtenances will automatically be cut out of commission.

By reference to Figs. 1 and 2 it will be seen that the cap 9 is provided with a flange 31, which constitutes the inner wall of the annular chamber 8 and that it rests upon the annulus or floor 7. The flange 31 carries a horizontal chamber 32, which is closed except at the top, which supports a slotted burner disk 33 immediately beneath the vaporizing chamber 11. Therefore, the vaporizing chamber 11 will not depend wholly upon the heat from the flame supplied through the slots 13 but the bottom of the vaporizing chamber 11 will be directly subject to heat by flame passing through the slotted disk 33 since this burner element will be supplied from the annular chamber 8 because the chamber 32 communicates directly with the chamber 8, as indicated at 34.

As above described, the burner 8 can operate efficiently for any purpose for which gaseous fuel heat is to be used, and the device is primarily intended to be supported in the frame constituting part of what is commonly termed an oil stove. Obviously, the structure just described will provide heat only for one burner or one hot plate.

Suppose it is desired to extend the usefulness of the burner so that heat may be supplied to other portions of the stove. I may connect auxiliary burners with the vaporizing chamber 5 of the master burner A and in order to accomplish this I prefer to place a manifold 35 adjacent to the outlet 6′ and communicate it with the vaporizing chamber 5. The manifold 35 may be a separate piece or it may be cast with the block, as shown.

The manifold is indicated as having two oppositely located openings 36 and 37, communicating with pipes or ports 38 and 39 through valve casings 40 and 41, the valve casings constituting the couplings between the manifolds and the pipes 38 and 39 although the particular method of assembly is unimportant.

Each valve casing is shown as having through ports 42, which connect the manifolds to their complementary pipes 38 and 39, which support the burners B and C on their respective ends and each valve casing has a transverse valve seat or chamber 43 to receive a turning plug valve 44, provided with an opening 45 to coincide with the through port 42, as will be clearly seen in Fig. 4.

The end of the valve seat 43 in each instance is provided with a shouldered portion 46 to limit the turning movement of the valve 44 by contact with a pin 47. When the valves 44 are turned in one direction, the ports 42 and 45 will register so that unobstructed communication can be had between the pipes 38, 39 and the vaporizing chamber and the mixing chamber 5. When the valves are turned in the opposite direction to the limit of their movement, this communication will be cut off from either pipe, dependent upon which valve is turned.

The valves are provided with stems 48 and 49, having turning disks or wheels 50 and 51, corresponding to the turning wheel 52 for the valve stem 18 and as a matter of convenience, I prefer to arrange the stems and turning wheels in a group adjacent to the master burner A so that they will be readily accessible by the operator.

The burners B and C communicating with the pipes 38 and 39, may be of appropriate construction but they are shown as consisting of hollow members with slits 13′ in their upper ends to correspond to the slits 13 in the master burner.

When the parts are properly assembled and the master burner is operating satisfactorily and it is desired to supply fuel to another burner, for example B, it will be only necessary to turn the hand wheel 50 to impart movement to its valve 44 so that communication can be had between the burner B and the mixing chamber 5 to supply fuel vapor to the burner B, the gas being adapted to be ignited in the usual way through the slits 13′.

Then both the burners A and B will be in operation.

If an additional burner is to be used, the hand wheel 51 will be turned to establish communication between the mixing chamber 5 and the burner C, which may then have its gas ignited in the usual way.

Of course, the burner A must have sufficient capacity to not only take care of its own requirements but also the requirements of the additional burners and it may be necessary to effect a more or less appropriate regulation of the fuel by controlling the valve 18 to supply fuel from the vaporizing tube 11 in proportion to the demand for, obviously, when two or more burners are demanding fuel, the supply will have to be greater than when the master burner is operating alone. This, however, is a matter which can be readily determined by the operator and quickly provided for.

It will be apparent from the foregoing that I have provided a simple and inexpensive means for supplying fuel to one or a plurality of burners and that by the simple construction illustrated, a single master burner may contain the necessary elements for generating sufficient amount of liquid fuel so that auxiliary burners can be supplied without the necessity of having an individual generating mechanism for each burner. Therefore, the cost of production of the stove embodying the burner set such as is contemplated by my invention will be reduced to a minimum and will be considerably less than that of producing the ordinary type of oil stove where a separate generating mechanism is provided for each burner.

Another important feature is that with the arrangement contemplated, all of the valves are conveniently accessible from a localized point so that the operator does not have to move back and forth to control the different burners embodied in the organization.

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

In combination, a primary burner and auxiliary burners, a single gasifying chamber, and a single mixing chamber for supplying all of the burners, the primary burner having a burner chamber underlying the gasifying chamber and overlying the mixing chamber, and having conduits leading later-

ally from the mixing chamber upwardly into the gasifying chamber, a manifold opening to the outer end of the mixing chamber, conduits leading from the manifold to the auxiliary burners, and separate means controlling flow through the respective auxiliary burner conduits, flow from the mixing chamber to the primary burner chamber being unobstructed, whereby the primary burner may be operated alone and the auxiliary burners operated selectively but only in conjunction with the primary burner.

In testimony whereof I affix my signature.

WILLIAM C. COLEMAN.