

No. 822,650.

PATENTED JUNE 5, 1906.

C. C. CLEVELAND.
OIL BURNER.

APPLICATION FILED MAY 10, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

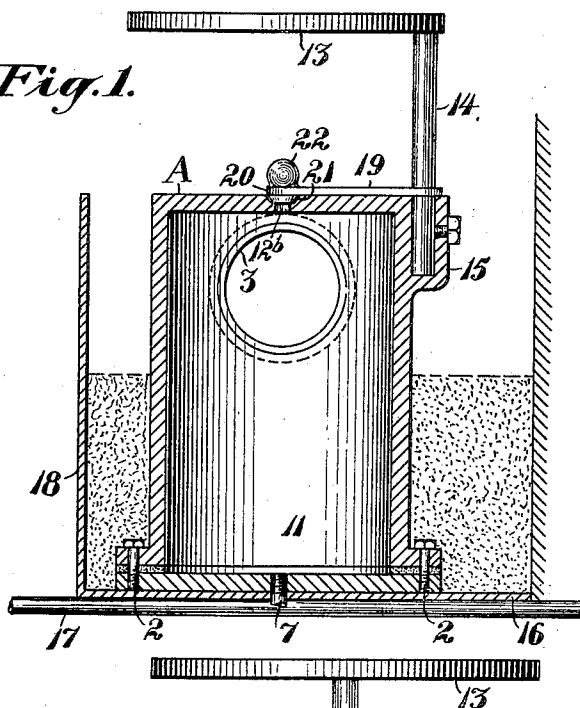
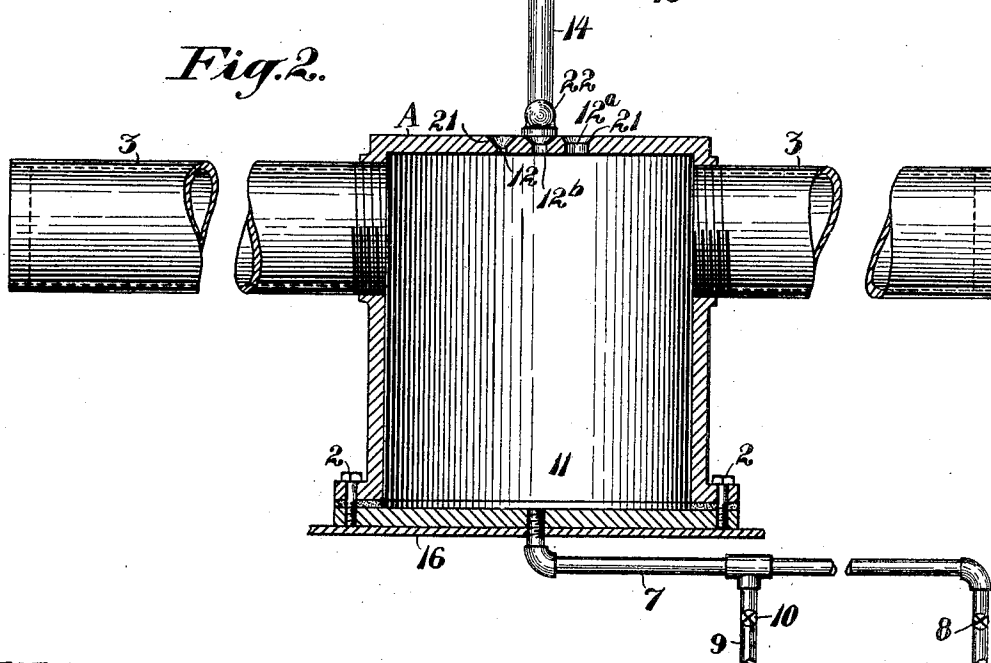


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

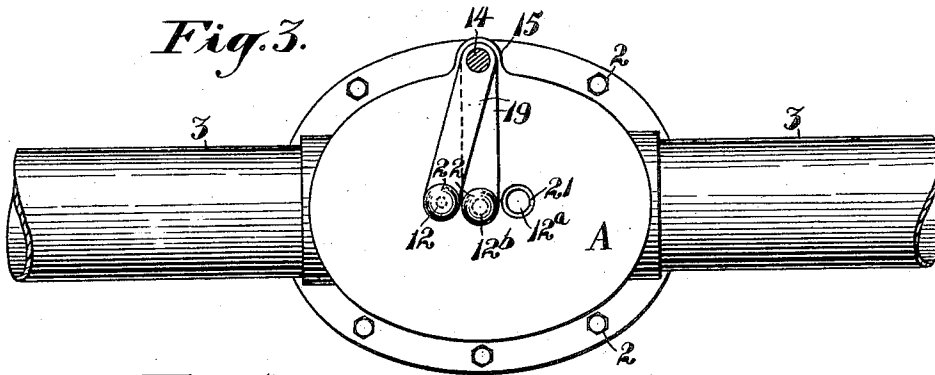


Fig. 4.

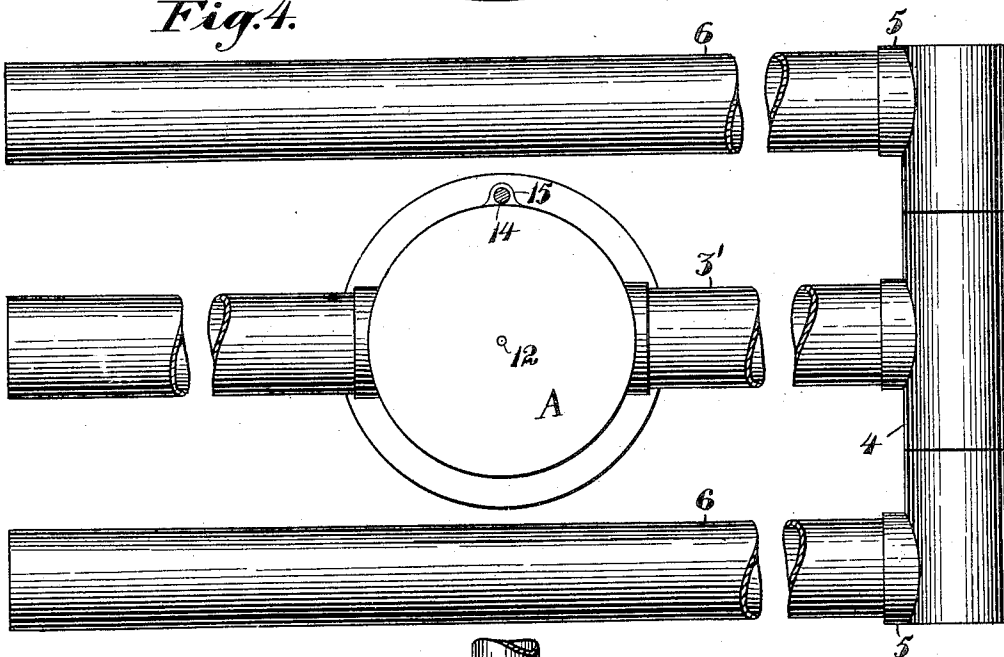
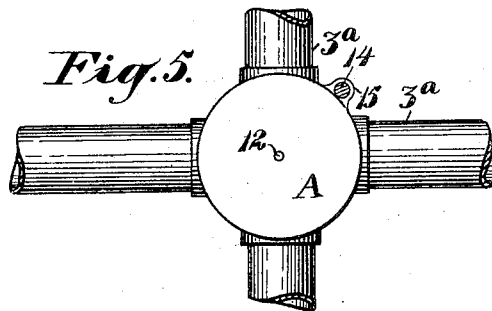


Fig. 5.



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UNITED STATES PATENT OFFICE.

CHARLES CARY CLEVELAND, OF KERN, CALIFORNIA.

OIL-BURNER.

No. 822,650.

Specification of Letters Patent.

Patented June 5, 1906.

Application filed May 10, 1905. Serial No. 259,749.

To all whom it may concern:

Be it known that I, CHARLES CARY CLEVELAND, a citizen of the United States, residing at Kern city, in the county of Kern and State of California, have invented new and useful Improvements in Oil-Burners, of which the following is a specification.

My invention relates to hydrocarbon-burners, and especially to burners for use in stoves, grates, furnaces, and the like.

My object is to provide a simple practical burner for ordinary fuel-oil which will not clog up, but will permit the use of ordinary globe-valves instead of the needle-valves used in most burners, which will effect an automatically-regulated pressure-feed for the oil, which will not become incrustated with carbon, and which can be easily cleaned or blown out at any time.

The invention consists of the parts and the construction and combination of parts, as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a sectional view of my burner in position in a fire-box. Fig. 2 is a section of the burner at right angles to the view of Fig. 1. Fig. 3 is a plan of the burner with deflector removed. Figs. 4 and 5 are plans of modified forms of my burner.

My burner is essentially of the retort variety, in which the oil is fed into a closed chamber and is subjected to a sufficient heat to gasify the volatile portion of the oil, burning the gas so produced outside of the retort and employing the radiated heat of the gas so burned to keep up the temperature of the retort.

As here shown, A represents a retort of suitable shape and size. Preferably it is in the form of a tubular cap or shell portion seating on and suitably secured to a base-plate, as by means of the ordinary stove-bolts 2. An asbestos gasket may be interposed between the cap and base-plate to form an oil-tight joint. In practice I make the cap about three inches in diameter and about four inches in height. I find that this is suitable for a great variety of sizes of burners and fire-boxes.

The cap portion of the retort at a suitable distance above the base is tapped to receive one or more horizontal radially-disposed generator-tubes 3. The number of these tubes and their arrangement will depend on the size and shape of the fire-box and on the amount

of heat or flame desired to be produced by the burner. In Fig. 2 I have shown simply two of these tubes extending from opposite sides of the retort and adapted to an ordinary stove.

In Fig. 4 I have shown the tube 3' on one side of the retort, screwing into a T 4, and the ends of this T connected by elbows 5 with the supplemental generator-tubes 6, flanking the tubes 3'.

If desired and where circumstances permit, several tubes may be arranged radially, as shown at 3^a, Fig. 5.

Oil is admitted into the bottom of the retort from any suitable source of supply through the pipe 7, and the feed of oil there-through is controlled by a suitable valve 8. Ordinarily the oil-feed will be by gravity and under only a few pounds of pressure.

9 is a drain-pipe tapping the feed-pipe 7 and is for the purpose of drawing off the residue from the retort at any time. This drain-pipe 9 is provided with a suitable valve 10.

The generator-tubes 3 or 3' or 3^a are preferably arranged near the top of the retort, or at least a suitable distance from the bottom thereof to leave a well 11, in which a quantity of oil is nearly always maintained and from which well the oil may flow off in various directions into the generator-tubes, which latter are closed at their ends.

In the top of the generator is provided one or more small orifices 12 12^a 12^b, through one or the other of which the generated gas may escape upwardly to strike against the horizontal deflector-plate 13, which is carried on the standard 14, having a limited pivotal movement in the socket 15 on the retort to enable the plate to be turned from side to side for the purpose of easily getting at the orifices in case they ever become clogged up.

In practice with the burner suitably supported in the fire-box a suitable quantity of oil is let into the well and a small fire kindled to heat up the retort and the generator-tubes. For fuel a low-grade distillate is used, and it is only a few moments before gas is being sent off from the oil in the retort and on issuing from an orifice is deflected downward on all sides by the plate 13 to become suitably mixed with air and ignited. The height of the deflector-plate 13 above the retort is regulated according to the size of the fire-box and the orifice 12 or 12^a or 12^b, whichever may be open, so that it properly deflects the gases and effects their mixture with the air to pro-

duce the best results. Having once ignited the gas around and underneath the deflector 13, the cock 8 may be opened and the further feed of the oil-supply to the generator will be self-regulating, since any excess of feed of oil into the generator will cause a greater overflow into the radial generator-tubes, which are within the range of heat of the burning gas above. The orifice being regulated in size according to the oil-feed pressure and the desired flame lets only so much gas pass through under a certain pressure. With an excess of oil in the generator the oil-level rises and contacts with the hotter portions of the same, causing a greater amount of gas to be generated, which creates a corresponding pressure within the generator, and if this generation of gas increases and the pressure in the chamber is greater than the pressure in the oil-pipe some of the oil will be forced back through the pipe 7 into the oil-tank until the pressure in the generator is reduced. There is no danger whatever from this back pressure, since the gas is incapable of ignition until after it has passed through an orifice. The plate 13 spreads the flame in all directions and fills the fire-box at the same time. The flame never strikes the generator direct. The generator being situated below the flame is designed to be heated mainly by radiated heat, so that there will be no burning of the oil in the generator to cause carbonization, which is such a source of inconvenience and annoyance in many burners designed for the use of oils of asphaltic base.

With my burner the heavy non-volatile portions of the oil remain in the well or pocket 11 and may be drawn off occasionally through the pipe 9 by closing valve 8 and opening valve 10, and this drawing off from and flushing of the generator may take place even when the burner is in operation, the heavy residue then being in a state of greater mobility than when cold and the gas-pressure in the generator assisting to expel this product.

With my burner I find that I do not need to use needle-valves, but may use ordinary globe-valves, which have far less tendency to clog up by reason of the dirt usually carried in fuel-oils.

It is an easy matter to get at the interior of the retort for cleaning and other purposes by simply removing the bolts 2, by which the base-plate is held to the shell.

In placing the burner in position in a fire-box I usually employ a pan 16, seating on the grate-bars 17. The front 18 of the pan projects up to about the level of the top of the generator, while the part of the generator which incloses the oil-well is generally packed in sand, so that the main body of oil in the well is insulated by the sand from too great a heat, while the tubes and the portion of the generator projecting above the sand are pro-

tected from the indraft which is necessary for combustion, but which would otherwise unnecessarily cool the generator.

It has always been a matter of difficulty in oil-burners for stoves to regulate the amount of flame. Hence it is that in order to overcome this difficulty I may provide a plurality of discharge-orifices, as 12', 12^a, and 12^b, as here shown, in the top of the retort and preferably arranged in an arc which is concentric with the turnable deflector-stem 14. These orifices are of different diameters, so that each will allow a greater or less amount of gas to pass through from the others. For instance, if a large flame is desired, commensurate with the full capacity of the burner, orifice 12^a will be left open and the other two orifices temporarily plugged. If a smaller flame is desired, orifice 12^b will be opened and the other two plugged, and so on. In each case the deflector-plate is turned so that it stands centrally over the orifice, which is open.

In order to provide a simple closure for the orifices, I have here shown two arms 19, turning and slidable on the stem 14. Each arm carries a tapered plug-valve projection 20 on its under side, registerable with any of the orifices 12', &c. The orifices are preferably made each with a countersunk portion 21 of uniform diameter, so that either of the plug-closures 20 will seat and fit uniformly over any orifice. The arms 19 being easily lifted and turned from side to side makes it possible to open any one of the orifices, closing the other two to produce a flame of desired size. The arms may be weighted, as at 22, to hold the valves 20 down, although the manner in which they are supported on the stem 14 will ordinarily prevent any lifting of the valves to allow the gas to escape from beneath.

It is possible that various modifications in my invention may be made without departing from the principle thereof, and I do not wish to be understood as limiting myself to the specific construction as herein shown and described.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an oil-burner, the combination of a retort having a plurality of generator-tubes, extending radially therefrom and having closed outer ends, said retort having an oil-inlet at its bottom and a vapor-outlet at its top, a deflector disposed over said vapor-outlet, and a closure for the outlet said closure comprising a pivotally-mounted arm and a plug adapted to fit the vapor-outlet.

2. In an oil-burner, the combination of a retort having an oil-inlet at the bottom and a vapor-outlet at the top, a deflector-plate pivotally supported on the retort above the outlet, and a closure for said outlet said closure

comprising a pivoted arm and a plug adapted to fit the outlet.

3. In an oil-burner, the combination of a retort having an oil-inlet at the bottom and a vapor-outlet at the top, a deflector supported over the outlet, and a closure for the outlet said closure comprising a pivoted and vertically-movable arm and a plug carried thereby and adapted to enter the outlet.

4. In an oil-burner, the combination of a retort having an oil-inlet and a vapor-outlet, and a closure for the outlet said closure comprising a pivoted horizontally-movable, vertically-slidable arm having a weighted plug adapted to close said outlet.

5. In an oil-burner the combination of a retort inclosing an oil-well, an oil-feed pipe delivering into the well, said retort having radiating generating chambers above the well and provided with closed outer ends, and said retort having, also, a plurality of vapor-outlets of different sizes, and closures for said outlets said closures comprising pivoted arms and plugs.

6. In an oil-burner, the combination of a retort having an oil-well, an oil-feed pipe delivering into the well, said retort having a plurality of outlets of variable diameters and radiating generator-chambers above the well and a pivoted closure controlling each of said outlets, and a hinged deflector carried by the retort and disposed over said vapor-outlet.

7. In an oil-burner, the combination of a retort having an oil-well, an oil-supply pipe entering the bottom of the well, a valved drain-pipe entering said oil-supply pipe, said retort having a plurality of vapor-outlets of different sizes, a pivoted closure movable over said outlets and separately controlling the same, radiating generator-chambers

above the well, and a deflector arranged above said outlets.

8. The combination of a generator having an oil-well and radiating-chambers above the well, an oil-supply pipe delivering into the well, a plurality of vapor-outlets of different sizes for the generator, pivoted closures controlling said outlets, a deflector over said outlets, and a protective plate spaced from and extending substantially the height of the generator and adapted to direct the draft away from the generator and prevent the latter being unduly cooled.

9. In an oil-burner, the combination of a generator having an oil-inlet and a plurality of vapor-outlets of different sizes with suitable vertically and horizontally movable closures for one or more of said outlets.

10. In an oil-burner, the combination of a generator having an oil-inlet and a plurality of vapor-outlets of different sizes with suitable vertically and horizontally movable closures for one or more of said outlets, and a deflector-plate arranged over said orifices.

11. In an oil-burner, the combination of a generator, having an oil-inlet and a plurality of vapor-outlets, a stem pivotally supported on the generator, a deflector-plate carried by said stem and movable over said orifices, and closures for the orifices carried by the stem, said closures comprising pivoted arms and a plug carried thereby adapted to fit the orifices.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CHARLES CARY CLEVELAND.

Witnesses:

S. H. NOURSE,

HENRY P. TRICOU.