

V. H. & J. H. T. MILLS.

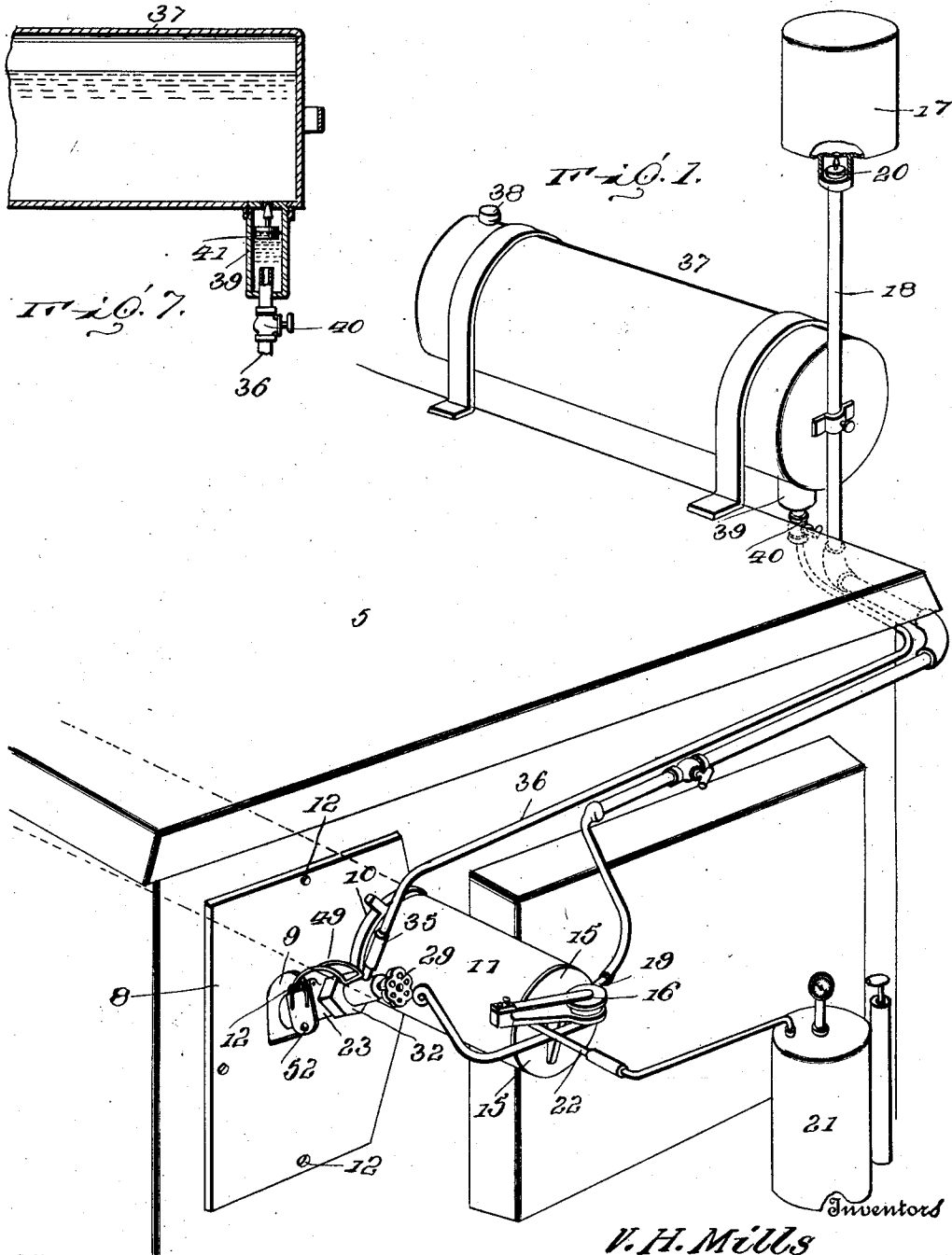
OIL BURNER.

APPLICATION FILED OCT. 5, 1910.

Patented July 11, 1911.

3 SHEETS—SHEET 1.

997,574.



Witnesses
Wm. Geaman
John C. Finnie

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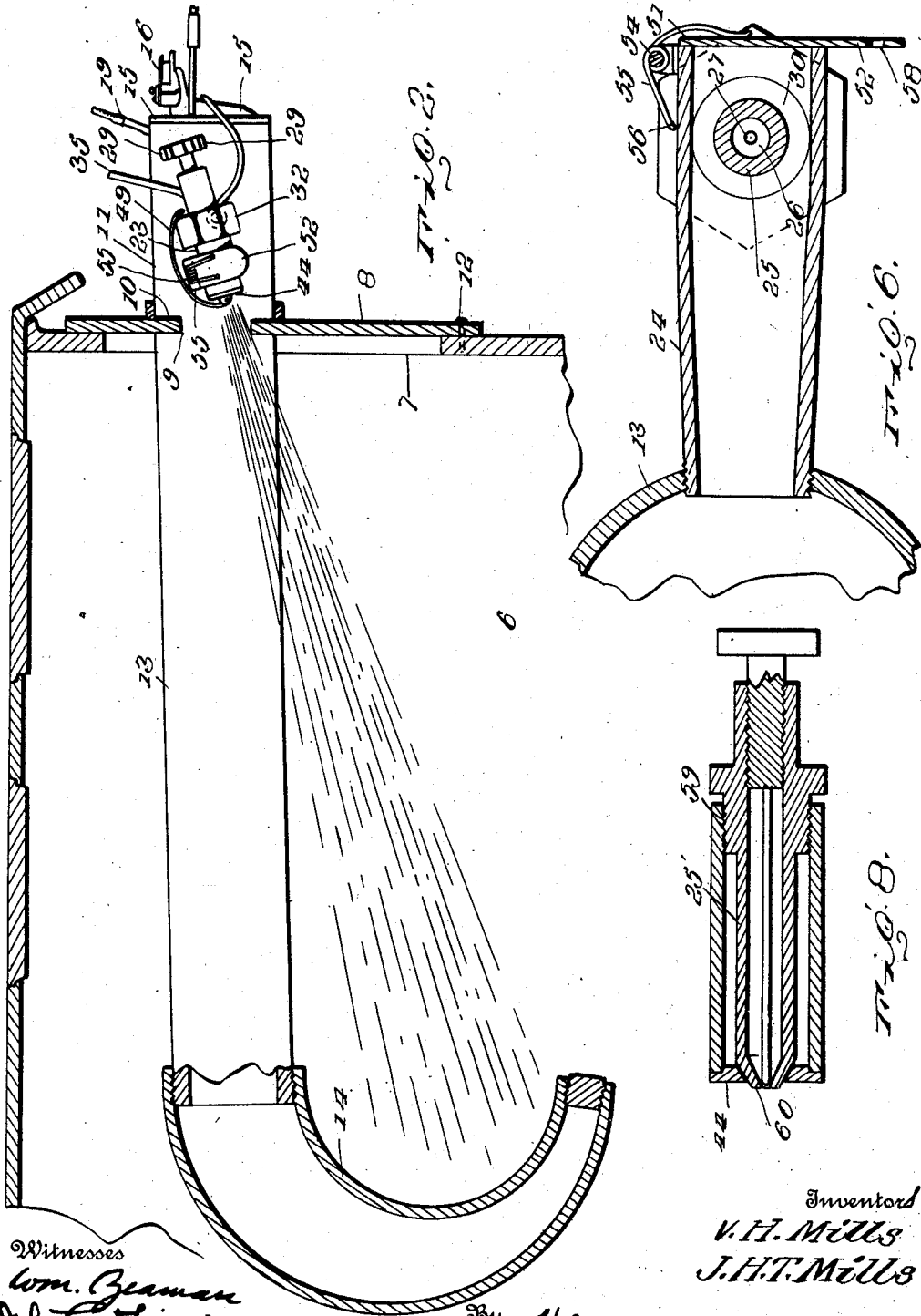
By *Wm. H. Macy*, Attorneys

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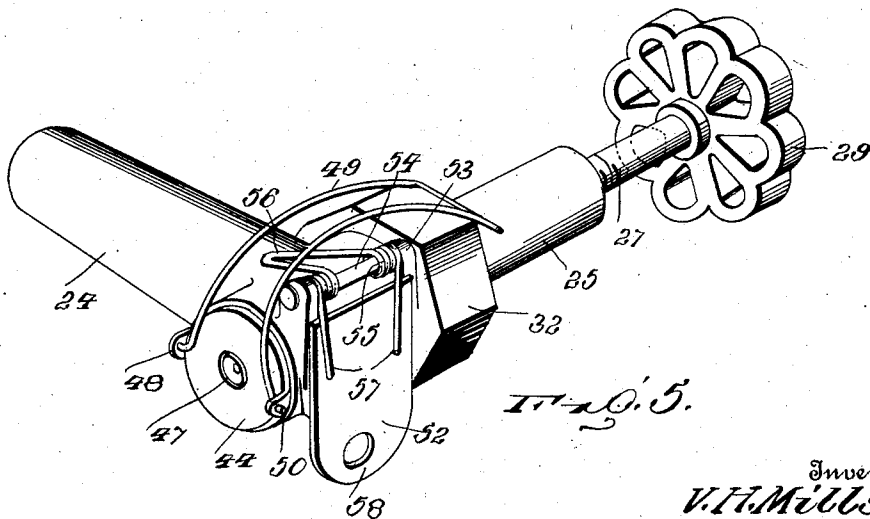
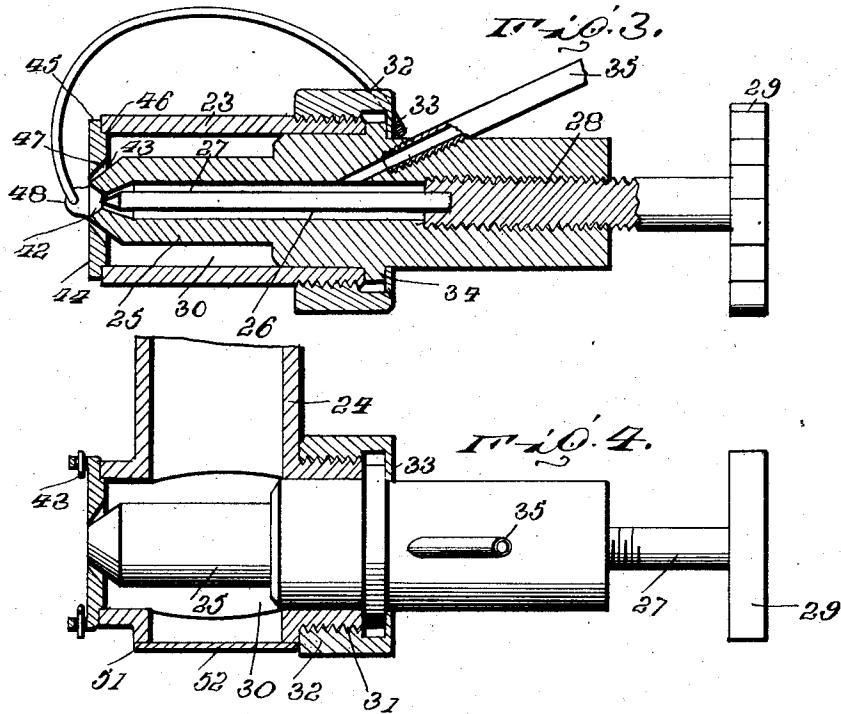
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UNITED STATES PATENT OFFICE.

VIRGIL H. MILLS AND JOHN H. T. MILLS, OF HUBBARD, TEXAS.

OIL-BURNER.

997,574.

Specification of Letters Patent. Patented July 11, 1911.

Application filed October 5, 1910. Serial No. 585,414.

To all whom it may concern:

Be it known that we, VIRGIL H. MILLS and JOHN H. T. MILLS, citizens of the United States, residing at Hubbard city, in the county of Hill and State of Texas, have invented certain new and useful Improvements in Oil-Burners, of which the following is a specification.

This invention relates to hydrocarbon burners and more particularly to that class of burners especially designed for burning crude petroleum and other hydrocarbon oils.

The object of the invention is to provide a strong, durable and thoroughly practical burner, the construction of which is such as to produce a maximum degree of heat with a minimum consumption of fuel.

A further object is to provide a hydrocarbon burner, in which a jet of steam or air is directed on the oil for the purpose of atomizing the fuel and effecting combustion of the latter without producing smoke at the burner tip.

A further object is to provide a novel form of nozzle which may be adjusted to regulate the discharge of steam and oil therefrom without the steam exerting a back pressure on the oil and checking the flow of fuel to the burner tip.

A further object is to provide a burner capable of being readily taken apart without the employment of specially constructed tools so that the burner may be quickly cleaned, when necessary.

A still further object of the invention is generally to improve this class of devices so as to increase their utility, durability and efficiency.

Further objects and advantages will appear in the following description, it being understood that various changes in form, proportions and minor details of construction may be resorted to within the scope of the appended claims.

For a full understanding of the invention and the merits thereof, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a perspective view of a cooking stove provided with a hydrocarbon burner constructed in accordance with our invention; Fig. 2 is a vertical sectional view, showing the manner of supporting the burner in position on a stove; Fig. 3 is a

longitudinal sectional view of the burner; Fig. 4 is a top plan view, partly in section; Fig. 5 is a perspective view of the burner detached; Fig. 6 is a vertical sectional view, showing the connection between the generator and burner; Fig. 7 is a vertical sectional view of one end of the oil tank, showing the construction of the float; Fig. 8 is a longitudinal sectional view, illustrating a modified form of burner.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The improved hydrocarbon burner forming the subject matter of the present invention is principally designed for use in connection with heating and cooking stoves and by way of illustration is shown applied to a cooking stove of the ordinary construction, in which 5 designates the body of the stove, 6 the fire box and 7 an opening through which access may be had to the interior of said fire box.

The opening 7 is normally closed by a flat plate 8 having openings 9 and 10 formed therein, one of which is adapted to receive the burner and the other a generator 11, said plate being detachably secured to the front of the stove by bolts or similar fastening devices 12. The generator 11 comprises a tubular member or pipe 13 having its inner end projecting downwardly within the fire box 6 and provided with a downwardly and forwardly projecting extension 14.

The outer end of the generator is provided with a detachable cap 15 having a safety valve 16 to permit the escape of steam from the generator should the pressure in the latter become excessive.

Water is supplied from a tank 17 through a conductor 18 having one end thereof connected with a nozzle 19 projecting through the adjacent wall of the generator, said tank being provided with a flat valve 20 in order to insure a uniform flow of water from the tank to the generator.

An air tank 21 is arranged near the stove for connection with a tube 22 extending through the cap 15 for the purpose of forcing air through the generator to the burner when starting the device.

The above enumerated parts are shown

and described in our copending application Serial No. 585,415 and form no part of the present invention, the essential features of which reside in the construction of the burner *per se*.

The burner comprises a tubular body portion 23 having its front and rear ends open and provided with an integral extension or pipe 24 communicating with the interior of the generator and through which the steam from said generator is conducted to the burner tip. Disposed within the body portion 23, is a tubular member 25 having an interior oil receiving chamber 26 through which extends a needle valve 27, the latter being threaded in the outer end of the tubular member at 28 and provided with a terminal finger piece or handle 29 by means of which the valve 27 may be adjusted to regulate the quantity of oil discharged at the burner tip.

The tubular member 25 is spaced from the interior wall of the body portion 23 to form a circumferential steam chamber 30 communicating through the medium of the pipe 24 with the interior of the generator, as best shown in Fig. 6 of the drawings. The exterior walls of the body portion 23 are threaded at 31 for engagement with a clamping nut 32, the latter being provided with an inwardly extending flange 33 which engages a circumferential shoulder 34 formed on the tubular member 25, thus firmly clamping said tubular member within the body portion. Threaded or otherwise secured to the tubular member 25, is a nipple 35, the inner end of which communicates with the oil chamber 26, while the outer end of said nipple is connected with a pipe or conductor 36 leading to an oil tank or reservoir 37. One end of the oil tank 37 is provided with a filling orifice 38, while the other end thereof is provided with a depending extension 39 constituting a trap for the reception of water, sediment and the like in the oil. The inner end of the pipe 36 extends upwardly within the trap 39 and is provided with a valve 40 by means of which the flow of oil from the tank to the burner may be controlled at will.

Disposed within the trap 39, is a float valve 41, similar in construction to the float valve 20 which serves to insure a uniform flow of oil under constant pressure from the tank 37 to the burner. By unscrewing the trap 39, the contents thereof may be discharged when it is desired to clean the same.

The outer or reduced end of the tubular member 25 is provided with a conical opening 42, while the exterior walls of said tubular member are inclined or beveled in the direction of the opening 42, as indicated at 43 so as to direct the steam from the chamber onto the oil as the latter passes from the

chamber 26 through the opening 42, thereby to nebulize the oil and effect perfect combustion of the fuel at the burner tip.

Detachably secured to the body portion, is a removable cap or disk 44 having an annular flange 45 which bears against the adjacent end of the body portion, said flange defining an annular shoulder 46 adapted to bear against the interior walls of the body portion 23 for the purpose of centering the cap or disk with respect to the conical end of the tubular member 25.

The inner face of the cap or disk 42 is provided with a conical shaped opening 47 through which extends the adjacent end of the tubular member 25, the inclined walls 43 of the tubular member being spaced from the inclined walls of the opening 47 to form a passage for the steam, air or other fluid in the chamber 30.

The disk or cap 44 is provided with oppositely disposed perforated ears 48, in which is pivotally mounted a spring yoke or bail 49. The terminals of the arms forming the bail or locking member 49 are bent laterally to produce fingers 50 which extend through the perforations in the ears 48, while the closed end of the bail or yoke bears against the flange on the nut 32 and serves to clamp the cap in position on the body portion. The cap 44 not only forms one wall of the steam passage at the burner tip, but also permits the interior of the body portion to be readily cleaned by merely detaching said cap.

The conical end of the tubular member 25 may be arranged as shown in Fig. 3 of the drawings, or said tip may be projected beyond the outer face of the cap 44 or moved to a position a short distance back of the outer face of the cap, according to the requirement of the burners and the results desired to be produced.

By forming the burner in this manner, the fuel is not only thoroughly nebulized, but back pressure of the steam on the oil is reduced to a minimum, thus insuring a uniform flow of fuel to the burner tip.

In order to facilitate cleaning of the body portion 23, one side thereof is formed with an opening 51, said opening being normally closed by a slide or cover 52. Formed on the body portion 23 at the opening 51, are spaced perforated lugs 53 through which a rod 54 projects and is adapted to receive and support a spring 55. The spring 55 is preferably formed of a single length of wire having its intermediate portion bent upon itself to produce a loop 56 which bears against the adjacent surface of the body portion, while the opposite ends or legs of the spring are coiled around the rod 54 and terminate in spaced fingers 57 which bear against the upper surface of the slide 52 and yieldably support the latter on its seat.

The tension of the spring 55 is sufficient to prevent the steam in the chamber 30 from elevating the slide and permitting the escape of said steam. One end of the slide or closure 52 is provided with a finger opening 58, by means of which the slide may be readily withdrawn from engagement with the fingers 57 when it is desired to clean the interior of the body portion 23.

10 In operation, oil is fed from the tank 37 through the conductor 36 and nozzle 35 to the oil chamber 26, the quantity of oil discharged at the burner tip being regulated by turning the finger piece 29. The steam generated in the member 11 passes through the conductor 24 into the chamber 30 and is directed onto the oil by the cap 44, thus thoroughly nebulizing the oil and effecting combustion of the fuel without producing smoke at the burner tip.

20 In Fig. 8 of the drawings, there is illustrated a modified form of the invention, in which the clamping nut 32 is dispensed with, the outer end of the tubular member 25' being threaded in the casing, as indicated at 59. In this form of the device, the outer or conical end of the tubular member 25' is preferably flat at 60 instead of being concaved, the construction and operation of the device being otherwise similar to that shown in Figs. 1 to 4 inclusive of the drawings. In Fig. 8 of the drawings, the conical end of the tubular member 25 is shown by way of illustration slightly in advance of the outer face of the cap 44, but it will of course be understood that the position of the flat surface 60 of the tubular member may be varied with respect to the cap by rotating said tubular member in the body portion of the burner, the burner shown in Fig. 8 being preferably used for heating large stoves or furnaces.

45 While the burner is principally designed for use in connection with heating and cooking stoves, it will of course be understood that the same may be used with equally good results on boiler furnaces, locomotives, hot air furnaces or wherever a burner of this character is found desirable and practicable. 50 When the burner is used in connection with large furnaces it is preferred to employ the type having the concaved tip.

Having thus described the invention, what is claimed as new is:

55 1. A burner including a hollow body portion, a tubular member disposed within and spaced from the body portion to form independent chambers, one end of the tubular member being conical in shape and provided with a concave recess, means for admitting fluid to one of the chambers, means for supplying oil to the other chamber, a valve operating in the oil chamber, a cap forming a closure for the opening in the body portion and provided with a discharge orifice, 65

and a clamping bail connected with said cap and adapted to engage the body portion for retaining the cap in position thereon.

2. A burner including a hollow body portion having one end thereof open and provided with threads, a tubular member disposed within and spaced from the body portion to form independent oil and fluid chambers, a flange formed on the tubular member, a clamping nut engaging the threads on the body portion and provided with a flange bearing against the flange on the tubular member, a cap forming a closure for one end of the body portion and provided with a discharge orifice, and means secured to the cap and engaging the nut for clamping said cap in position on the body portion. 70 75 80

3. A burner including a hollow body portion having one end thereof open and its other end threaded, a tubular member disposed within and spaced from the body portion to form independent oil and fluid chambers, a valve operating in the oil chamber, a cap engaging the open end of the body portion and provided with a discharge orifice, a nut threaded on the body portion and engaging the tubular member, and a bail pivotally mounted on the cap and engaging the nut for retaining said cap in position on the body portion. 85 90 95

4. A burner including a hollow body portion having one end thereof open, a tubular member disposed within and spaced from the body portion to form independent chambers, means for admitting fluid to one of the chambers, a tube extending through the tubular member and having one end thereof communicating with the oil chamber and its other end operatively connected with a storage tank, a cap disposed at the open end of the body portion and having a discharge orifice and laterally extending ears, and a bail mounted in the ears and adapted to engage the body portion for retaining said cap in position thereon. 100 105 110

5. A burner including a hollow body portion, a tubular member disposed within and spaced from the body portion to form independent fluid and oil receiving chambers, a valve operating in the oil chamber, a cap forming a closure for one end of the body portion and having a shoulder bearing against the inner wall of the body portion and a discharge orifice, the wall of which is spaced from the end of the tubular member, ears formed on the cap, and a bail mounted in the ears and adapted to engage the body portion. 115 120

6. A burner including a hollow body portion, a tubular member disposed within and spaced from the body portion to form independent oil and fluid receiving chambers, the exterior wall of the tubular member at one end thereof being inclined, a cap forming a closure for one end of the body portion and 125 130

having a discharge orifice, the wall of which is inclined and spaced from the inclined wall of the tubular member, and a spring locking member pivotally mounted on the cap and detachably engaging the body portion.

7. A burner including a hollow body portion, a tubular member disposed within and spaced from the body portion to form independent oil and fluid chambers, one end of the tubular member being provided with a terminal conical recess and the outer wall of said end being beveled, a valve operating in the oil chamber, a cap forming a closure for one end of the body portion and having a discharge orifice, the wall of which is inclined and spaced from the beveled wall of the tubular member, and a bail carried by the cap and adapted to engage the body portion for clamping said cap in position thereon.

8. A burner including a hollow body portion, a tubular member disposed within and spaced from the body portion to form independent oil and fluid chambers, there being a cleaning opening formed in one side of the body portion, a cap detachably secured to and forming a closure for one end of said body portion and having a discharge orifice, a valve operating in said oil chamber, a closure for the cleaning opening in the body portion, and means for retaining the closure to its seat.

9. A burner including a hollow body portion having a cleaning opening formed in one side thereof, a tubular member disposed

within and spaced from the body portion to form independent oil and fluid chambers, a valve operating in the oil chamber, a detachable cap forming a closure for one end of the body portion and having a discharge orifice, spaced lugs formed on the body portion, a pin seated in said lugs, a plate forming a closure for the cleaning opening, and a spring engaging the pin and having one end thereof bearing against the body portion and its other end provided with fingers bearing against said plate.

10. A burner including a hollow body portion having a cleaning opening formed in one side thereof, a tubular member disposed within and spaced from the body portion to form independent chambers, means for admitting steam to one of the chambers, means for feeding oil under constant pressure to the other chamber, a valve operating in the oil chamber, a removable cap forming a closure for one end of the body portion and provided with a discharge orifice, a bail mounted on the cap and engaging the body portion, a closure for the cleaning opening, and yieldable means engaging said closure for preventing accidental displacement thereof.

In testimony whereof, we affix our signatures in presence of two witnesses.

VIRGIL H. MILLS. [L. S.]
JOHN H. T. MILLS. [L. S.]

Witnesses:

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THOMAS E. FARMER.