

No. 776,161.

PATENTED NOV. 29, 1904.

W. T. WOOD.
HYDROCARBON BURNER.
APPLICATION FILED FEB. 9, 1904.

NO MODEL.

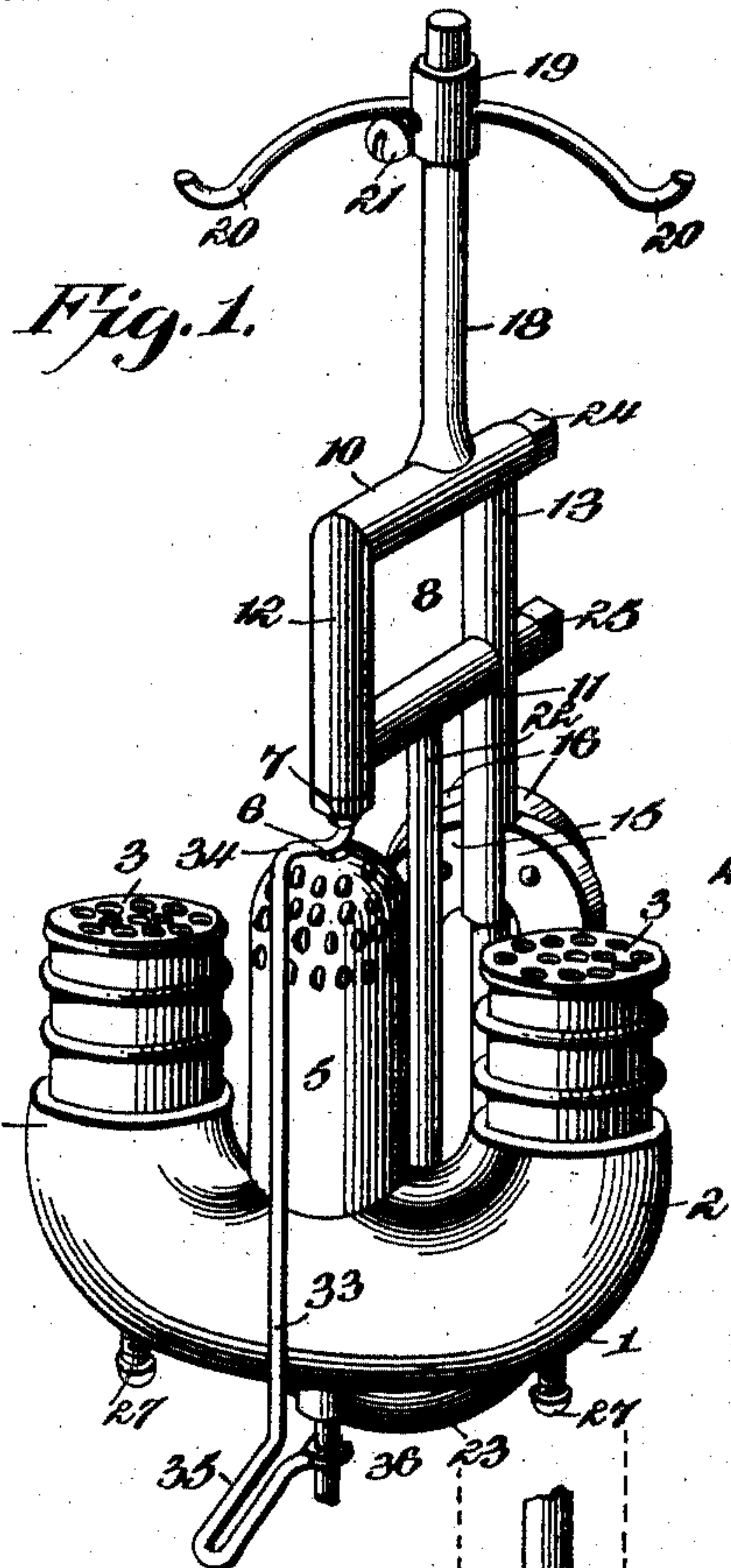


Fig. 1.

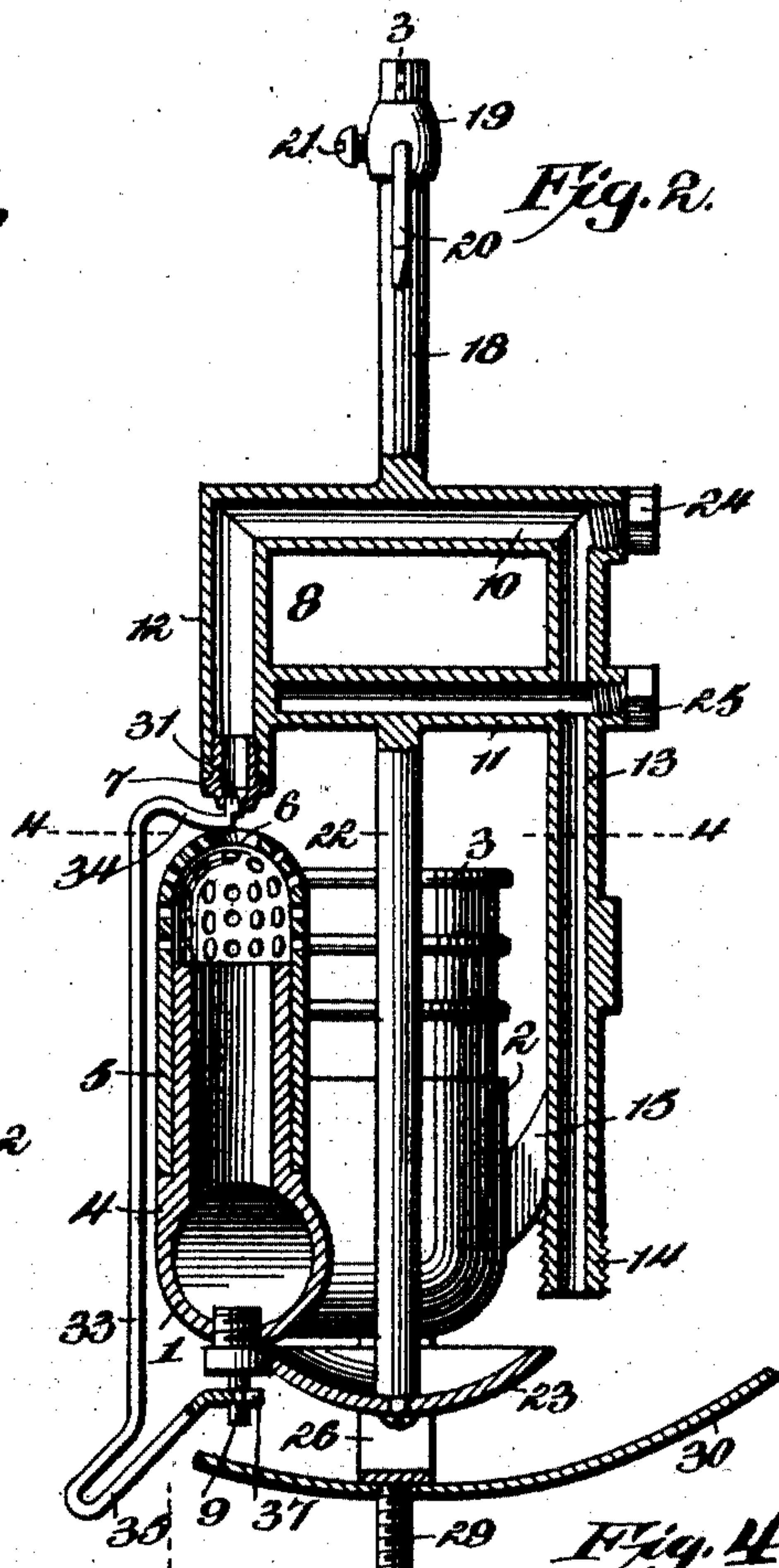


Fig. 2.

Fig. 3.

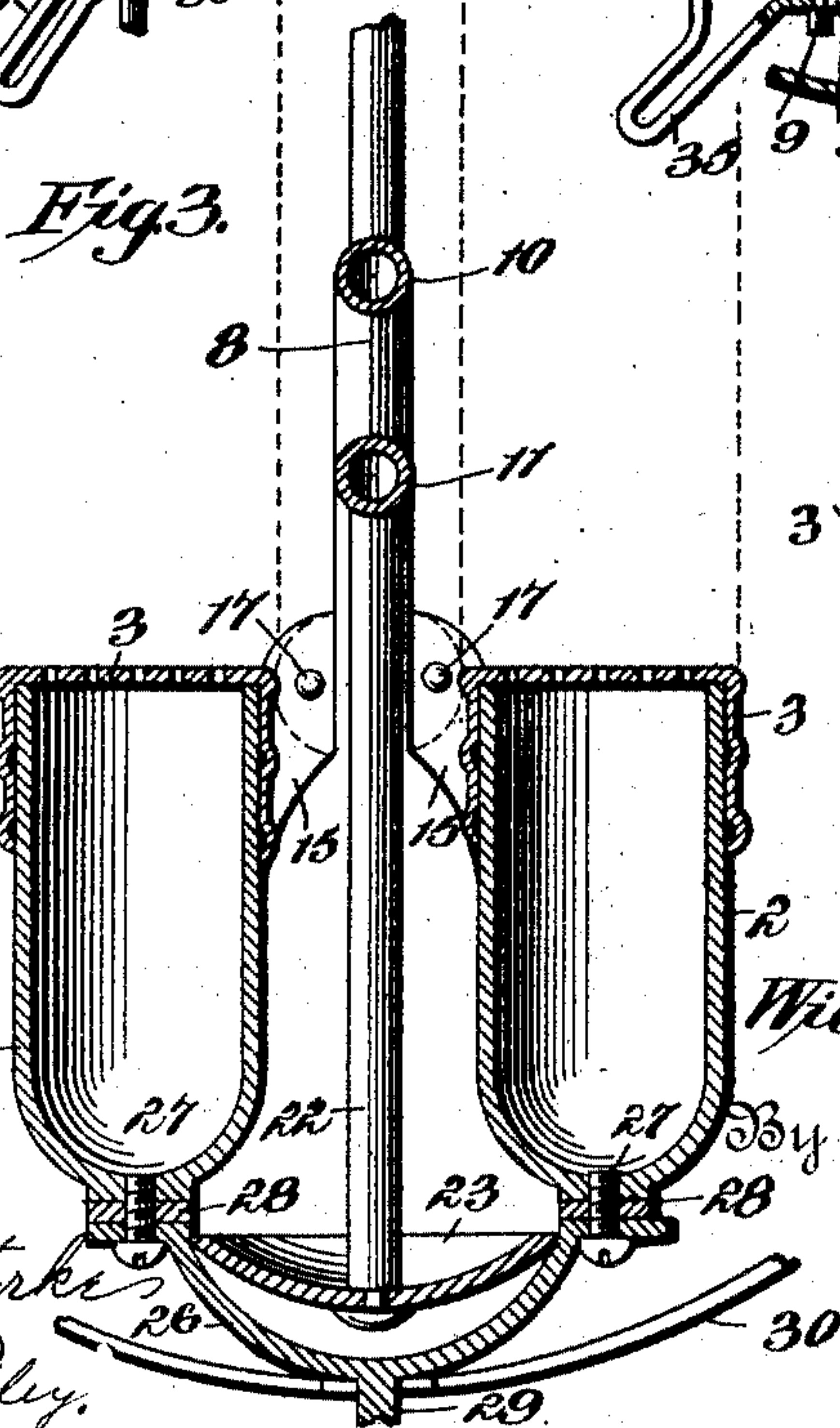
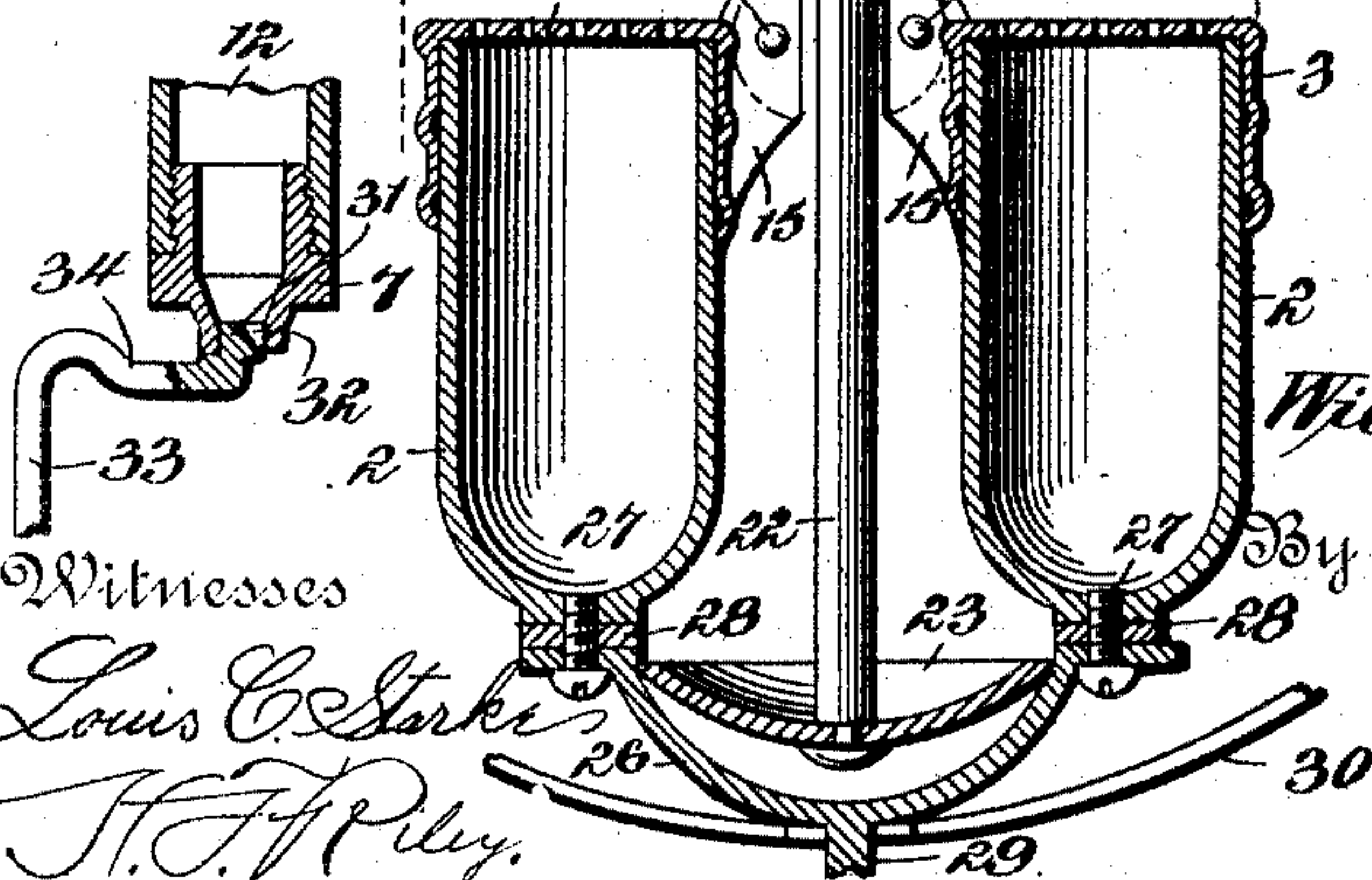


Fig. 5.



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HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 776,161, dated November 29, 1904.

Application filed February 9, 1904. Serial No. 192,802. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM THOMAS WOOD, a citizen of the United States, residing at Nashville, in the county of Davidson and State of Tennessee, have invented a new and useful Hydrocarbon-Burner, of which the following is a specification.

The invention relates to improvements in hydrocarbon-burners.

The object of the present invention is to improve the construction of hydrocarbon-burners and to provide a simple and comparatively inexpensive one designed for incandescent lighting from kerosene-oil and capable of effectually eliminating sweating, dripping, condensation, and all foul odors usually resulting from burners of this class using kerosene.

A further object of the invention is to provide a burner of this character in which the parts will be compactly arranged and which by reason of such compactness will enable the vaporizer and the other parts of the burner to be sufficiently heated without the employment of supplemental burners or subflames.

Another object of the invention is to provide a hydrocarbon-burner in which the carbon deposit will be reduced to a minimum and which will enable the parts to be readily and quickly cleaned when necessary.

With these and other objects in view the invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended, it being understood that various changes in the form, proportion, size, and minor details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a perspective view of a hydrocarbon-burner constructed in accordance with this invention, the mantle being omitted in order to illustrate the other parts of the burner more clearly. Fig. 2 is a vertical sectional view of the same. Fig. 3 is a vertical sectional view taken substantially on the line 3 3 of Fig. 2. Fig. 4 is a horizontal sectional view taken substantially on the

line 4 4 of Fig. 2. Fig. 5 is a detail sectional view illustrating the construction of the removable tip of the nozzle.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a substantially semicircular burner-body of tubular form provided at its ends with upwardly-extending burner-tubes 2, having gauze burner-caps 3, which may be of any desired construction and which are fitted on the vertical burner-tubes in the usual manner. The tubular burner-body may be constructed of any suitable material, and it is provided between its ends with an upwardly-extending mixing or commingling chamber consisting of a tube 4 and a gauze or perforated cap 5, fitted on and extending above the tube 4. The mixing or commingling chamber is located intermediate of the burner-tubes and off from the line passing through the centers of such tubes. The perforations or apertures are adapted to admit air to the mixing or commingling chamber, and an enlarged opening 6 is provided at the top of the mixing-chamber for the passage of vapor. The vapor is discharged into the mixing or commingling chamber in a fine spray from a nozzle 7 of a vaporizer 8. The nozzle, which is threaded into the vaporizer, is provided with an outer wrench-receiving portion and is readily removed to enable it to be quickly cleaned when necessary.

The nozzle is provided with a removable tip 31, fitted above the lower end of the nozzle and provided with a tapering groove located at the side adjacent to the center or inner portion of the burner and forming a very fine discharge-opening for adapting the burner for the use of kerosene or coal oil as a fuel. The tip consists of the upper end of a substantially vertical rod 33, located at the outer side of the mixing or commingling chamber and bent inward at its upper portion to form an arm 34, which extends between the tip of the cap 5 and the lower end of the nozzle. The lower portion of the rod is bent to form an inclined loop 35, which is substantially U-shaped, as shown, and the lower side

of the loop is extended and bifurcated at its upper end 36 for engaging a groove 37 of a removable plug 9. The loop serves as a handle and also operates as a spring, whereby the rod is securely retained in position. The rod is adapted to be readily detached for enabling the groove 32 of the tip to be readily cleaned. By this construction the burner is prevented from becoming clogged or inoperative by any carbon deposit. Also the mixing or commingling chamber is located substantially between and in close proximity to the burners, whereby intensely-heated air is supplied to the said mixing-chamber. Also the burner-body is intensely heated, and the distance between the mixing or commingling chamber and the burners is reduced to a minimum, and the passages from the mixing-chamber to the burner-tubes are highly heated, thereby effectually preventing sweating, dripping, and condensation and at the same time eliminating the foul odors which usually result from the use of kerosene in burners of this character. In order to further facilitate the cleaning of the discharge-nozzle, the burner-body is provided at a point directly below the mixing-chamber with the removable plug 9, fitted in a threaded opening of the burner-body and normally closing the same and threaded, as shown. By removing the plug 9 an instrument may be readily passed through the mixing or commingling chamber into the nozzle to remove any carbon deposit without detaching the said nozzle.

The vaporizer is approximately rectangular, and it consists of upper and lower transverse tubes 10 and 11 and vertical tubes 12 and 13, the tube 12 being shorter than the tube 13 and carrying the said nozzle 7. The upper end of the tube 12 communicates with the adjacent end of the upper transverse tube 10, and the inner end of the lower transverse tube 11 is closed, as clearly illustrated in Fig. 2 of the drawings. The vertical tube 13, which constitutes a feed or supply tube, communicates with the upper and lower tubes 10 and 11, and its lower end 14 is threaded to receive a union or other suitable means for connecting it with the source of supply. The source of supply may be a font or reservoir of any desired character, and the kerosene-oil is designed to be ejected from such font or reservoir by means of air under pressure, whereby a continuous supply of kerosene oil or vapor will be supplied to the burner. Also any form of valve may be employed for controlling the flow of fuel to the burner, and such valve may be located at any desired point to suit the character of the lamp in which the burner may be used, the burner being adapted for portable and stationary lamps and similar lighting devices. The vapor or oil passes upward through the supply-tube into the vaporizer or gas-generator 8 and is converted into

gas and is ejected at the short discharge-tube 12 into the mixing or commingling chamber, as before explained. The tubes of the vaporizer or generator form ducts or passages, and they are highly heated by the burner, being located between the mantles and above the burner-tubes, as shown, thereby obviating the necessity of employing subflames or supplemental burners for such purpose. The lower transverse tube 11 forms a trap, and in the event of the overflow of oil the lower transverse tube 11 will become filled before the oil rises higher in the vaporizer. Any oil flowing into the lower transverse tube or trap 11 will become vaporized and will pass upward through the feed-tube 13 to the upper transverse tube 10.

The body of the burner is provided at its ends with upwardly - extending converging arms 15, which are adapted to support the vaporizer and which are located off from the line passing through the centers of the burner-tubes. The vaporizer is provided at opposite sides of the feed-tube 13 with projecting lugs 16, which are secured to the arms by screws 17 or other suitable fastening devices. By this construction the vaporizer and the parts carried by the same may be instantly detached from the rest of the burner when necessary or desirable for cleaning or otherwise.

The vaporizer is provided with an upwardly-extending rod 18, forming a support for the sleeve 19, which is provided with projecting mantle-supporting hooks 20. The sleeve and the hooks form an adjustable mantle-support, which is secured at any desired adjustment by means of a set-screw 21, piercing the sleeve and engaging the rod 18. The rod 18 extends upwardly from the center of the upper transverse tube 10, and the supporting-rod 22 depends from the center of the lower tube 11 and carries at its lower end a cup or receptacle 23, adapted to receive the alcohol for heating the parts of the burner in starting the same. The parts are arranged above and in close proximity to the cup or receptacle 23, whereby they are highly heated by the same and condensation and deposits of hydrocarbon are prevented when lighting the burner. The vaporizer is also pierced at the upper portion of the supply-tube in line with the upper and lower tubes 10 and 11 and is provided at those points with threaded flanges for the reception of screws 24 and 25, which afford access to the upper and lower horizontal passages of the vaporizer for cleaning the same. As the passages of the vaporizer are straight, they may be conveniently cleaned and access may be had to any portion of the vaporizer.

The burner is mounted upon a bracket or yoke 26, having upwardly - extending arms and secured to the bottom of the body of the burner by screws 27 or other suitable fastening devices, the arms of the burner being iso-

lated or protected from the burner by asbestos 26 or other suitable material to prevent them from being heated by the burner. The bracket or yoke 26 is provided with a depending threaded stem 29, which may be mounted on a lamp fixture, stand, font, or receptacle or other support. A globe support or holder 30 of the ordinary configuration may be arranged on the threaded stem 29 immediately beneath the arms of the bracket 26, as shown.

It will be seen that the hydrocarbon-burner is especially adapted for burning kerosene-oil, that its parts are compactly arranged to permit the burner to occupy a comparatively small space and also to enable the parts of the burner to be effectually heated by the contents of the cup when starting the burner, and also to be maintained at a high temperature by the heat of the burner after the same is started, whereby subflames and supplemental heating means are eliminated. Also it will be clear that owing to the close proximity of the vaporizer, the mixing-chamber, and the body of the burner to the burner-tubes sweating, dripping, condensation, and foul odors are effectually prevented, and that carbon deposits are reduced to a minimum. Also it will be apparent that the vaporizer may be instantly detached and the parts of the burner may be readily and quickly cleaned should the same become necessary or desirable. The semicircular body portion of the burner forms a recess at its inner or concaved side to provide a central open space above the alcohol or starting cup, so that the flame therefrom is afforded an open space or passageway for heating the vaporizer. The burner-body is also heated by the flame simultaneously with the vaporizer in order to prevent the first vapor which enters the body from condensing rapidly and producing a slow, inactive, weak, smoky flame, that would not maintain the vaporizer at the proper temperature for producing the required amount of vapor to properly start off the light. The vaporizer has straight passages which are easily cleaned, and it is provided with a trap for catching any overflow of the oil to prevent the latter from rising in the vaporizer and interfering with the production of a steady white light free from flare or pulsation. It has been found by experience that where the vapor lifts the fluid and causes an overflow in that part of the vaporizer next to the mixing-tube the flame is rendered yellow and is caused to pulsate. This objection is overcome by the use of the trap.

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

1. A burner of the class described, comprising a curved burner-body forming an open space or recess at the center of the burner, a mixing or commingling chamber extending

upward from the body, a vaporizer located above the space or recess and discharging into the mixing or commingling chamber, and a starting-cup located beneath the space or recess, substantially as described.

2. A burner of the class described, comprising a curved burner-body forming an open space or recess at the center of the burner, a mixing or commingling chamber extending upward from the body, a vaporizer located above the open space or recess and discharging into the mixing or commingling chamber and provided with a depending support extending through the said space or recess, and a starting-cup carried by the support and located beneath the burner-body, substantially as described.

3. A burner of the class described, comprising a horizontally-disposed approximately semicircular burner-body, a starting-cup below the body, the shape of the latter forming an open space or recess at the center of the burner to permit the upward passage of the flame from the starting-cup, a mixing or commingling chamber mounted on the burner-body, and a vaporizer arranged above the said space or recess and discharging into the mixing or commingling chamber, substantially as described.

4. A burner of the class described, comprising a horizontally-disposed approximately semicircular burner-body provided at its ends with burner-tubes, a starting-cup below the same, said burner-body forming an open space or recess at its inner side to permit the upward passage of the flame from the cup, a short mixing or commingling chamber mounted upon the burner-body at the center thereof and extending upward therefrom, and a vaporizer arranged above the said space or recess and discharging into the mixing or commingling chamber, substantially as described.

5. A burner of the class described, comprising a horizontally-disposed approximately semicircular burner-body forming an open space or recess at its inner side, a mixing or commingling chamber extending upward from the body portion, a vaporizer located above the space or recess and discharging into the mixing or commingling chamber, said vaporizer being provided with a depending supporting-rod extending through the said space or recess, and a cup carried by the supporting-rod and located beneath the burner-body, substantially as described.

6. A burner of the class described, comprising a burner-body of approximately semicircular form having a recess at its inner side and having terminal burner-tubes and provided with projecting arms, a mixing-chamber mounted on the burner-body at an intermediate point, and a vaporizer supported by the said arms and located above and discharg-

ing into the mixing-chamber, substantially as described.

7. A burner of the class described, comprising a burner-body having a recess at its inner side and provided with opposite burner-tubes, an upwardly - extending mixing - chamber mounted on the burner-body and located at one side of the burner, arms extending from the burner-body at the opposite side of the burner, and a vaporizer mounted on and supported by the arms and located above and discharging into the mixing-chamber, substantially as described.

8. A burner of the class described, comprising a burner-body forming a recess at the inner side and provided with opposite burner-tubes, a mixing-chamber extending upward from the body intermediate of the burner-tubes and off from the line passing through the centers of the same, a supporting-arm projecting from the body at the opposite side thereof and also located off from the line passing through the centers of the tubes, and a superimposed vaporizer supported by the arm and discharging into the mixing-chamber, substantially as described.

9. A burner of the class described, comprising a body having a burner-tube, a mixing-chamber mounted on the body, and a superimposed vaporizer provided with opposite upright passages, and having a connecting-passage, one of the upright passages being connected with a fuel-supply, and the other arranged to discharge into the mixing-chamber, said vaporizer being also provided with a passage closed at its inner end and communicating at the outer end with the fuel-supply passage and forming a trap to receive any overflow, substantially as described.

10. A burner of the class described, comprising a body having a burner-tube, a mixing-chamber mounted on the body, and a superimposed vaporizer composed of opposite upright passages and connected at the top, and a transverse passage communicating with one of the upright passages and terminating short of the other and forming a trap to receive any overflow of oil, substantially as described.

11. A burner of the class described provided with a vaporizer comprising straight upright tubes and straight upper and lower connecting transverse tubes, the passage of

the lower connecting transverse tube being closed at one end and forming a trap to receive any overflow of oil, substantially as described.

12. A burner of the class described provided with a vaporizer comprising straight upright tubes and straight upper and lower connecting transverse tubes, the passage of the lower connecting transverse tube being closed at one end and forming a trap to receive any overflow of oil, said vaporizer being provided at one end of the transverse passages with removable closures, substantially as described.

13. A burner of the class described, embodying a vaporizer having a discharge-aperture, a removable tip fitting into the discharge-aperture, a rod supporting the tip, and means for detachably securing the rod to the burner, substantially as described.

14. A burner of the class described, comprising a burner-body, a vaporizer provided with a nozzle, and a rod provided at one end with a tip fitted within the nozzle, said rod being provided at its other end with a resilient portion detachably interlocked with the burner-body, substantially as described.

15. A burner of the class described, comprising a burner-body, a vaporizer having a nozzle, and a rod having one end fitted in the nozzle and forming a tip, said rod being provided at its other end with a resilient loop having one side interlocked with the burner-body, substantially as described.

16. A burner of the class described, comprising a burner-body, a mixing-chamber extending upward from the burner-body, a vaporizer having a nozzle located above the mixing-chamber, a removable plug piercing the burner-body in line with the nozzle and having a groove, and a rod provided at its upper end with a tip fitted within the nozzle, said rod having a loop at its lower end, and provided with a slot or bifurcation for engaging the groove of the plug, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM THOMAS WOOD.

Witnesses:

J. J. ANDERSON,

J. H. CLAYTON.