No. 607,996. Patented July 26, 1898.

A. KITSON.

VAPOR BURNING APPARATUS.

(Application filed Dec. 11, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

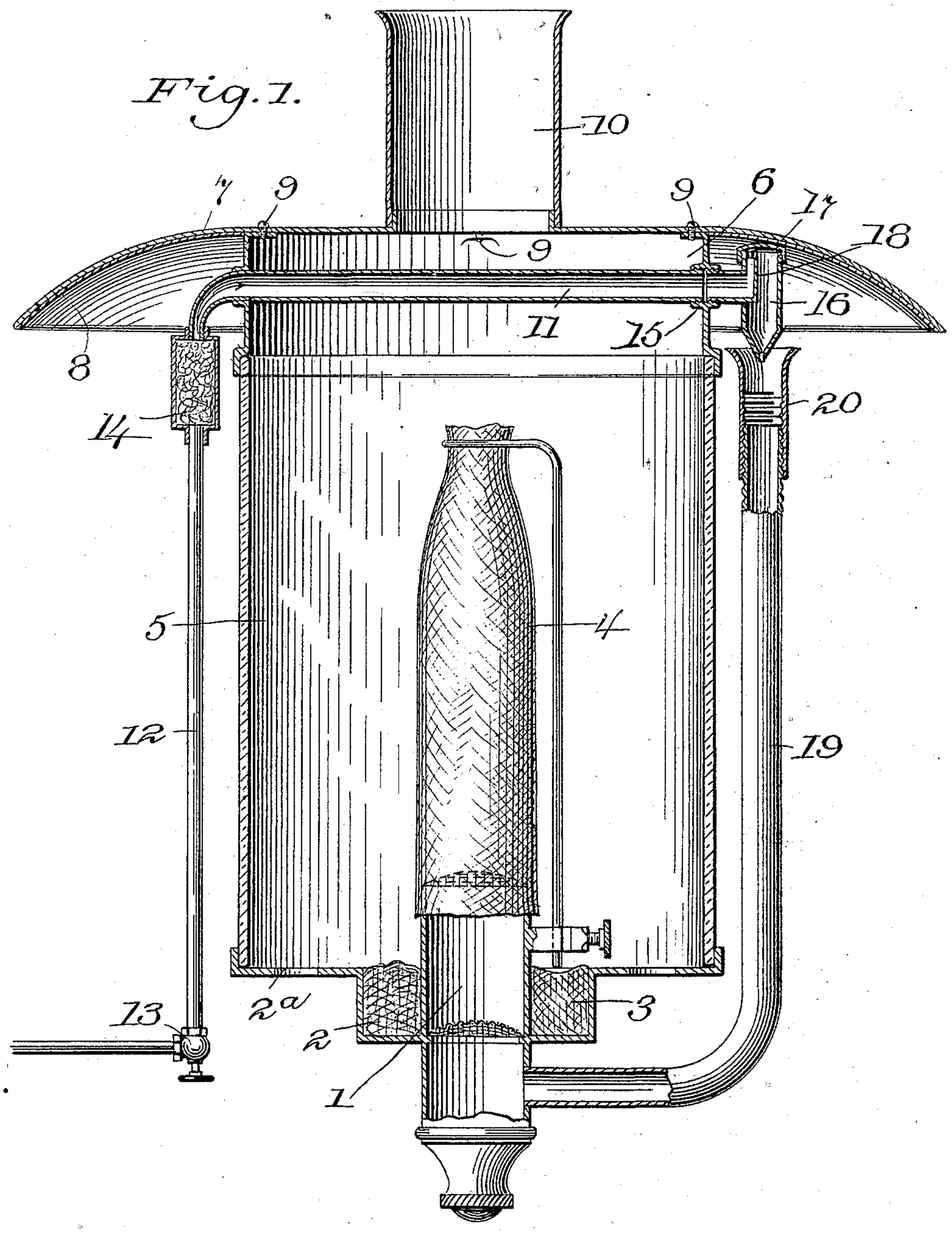

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Fig. 2.

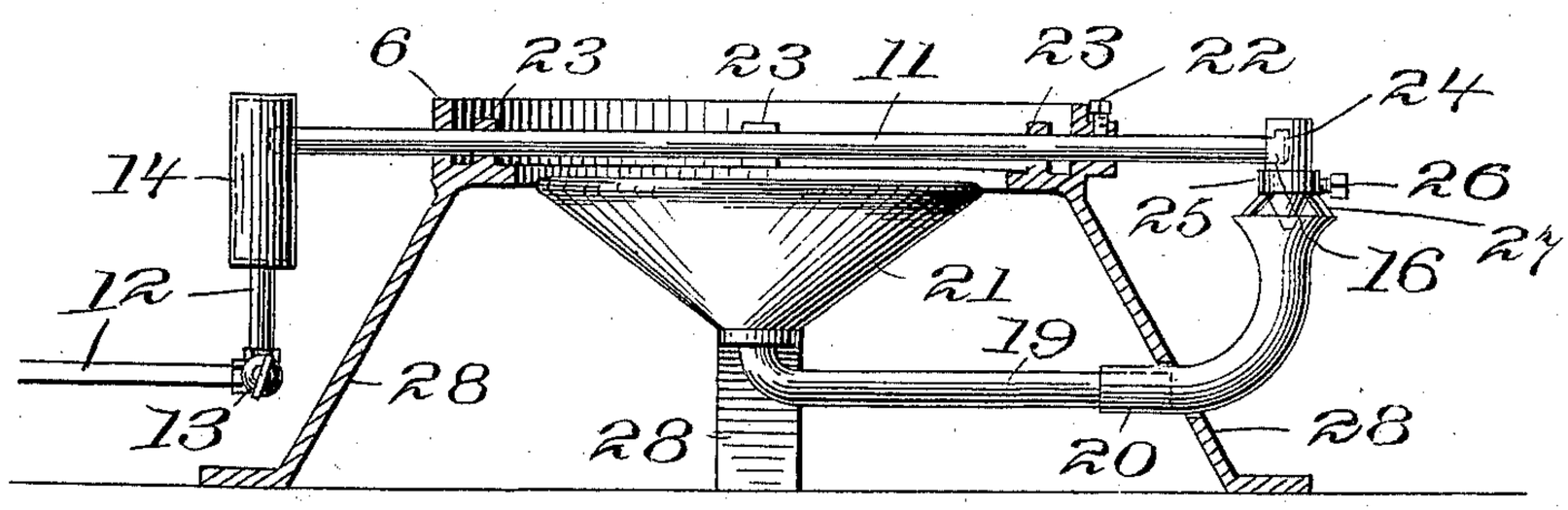
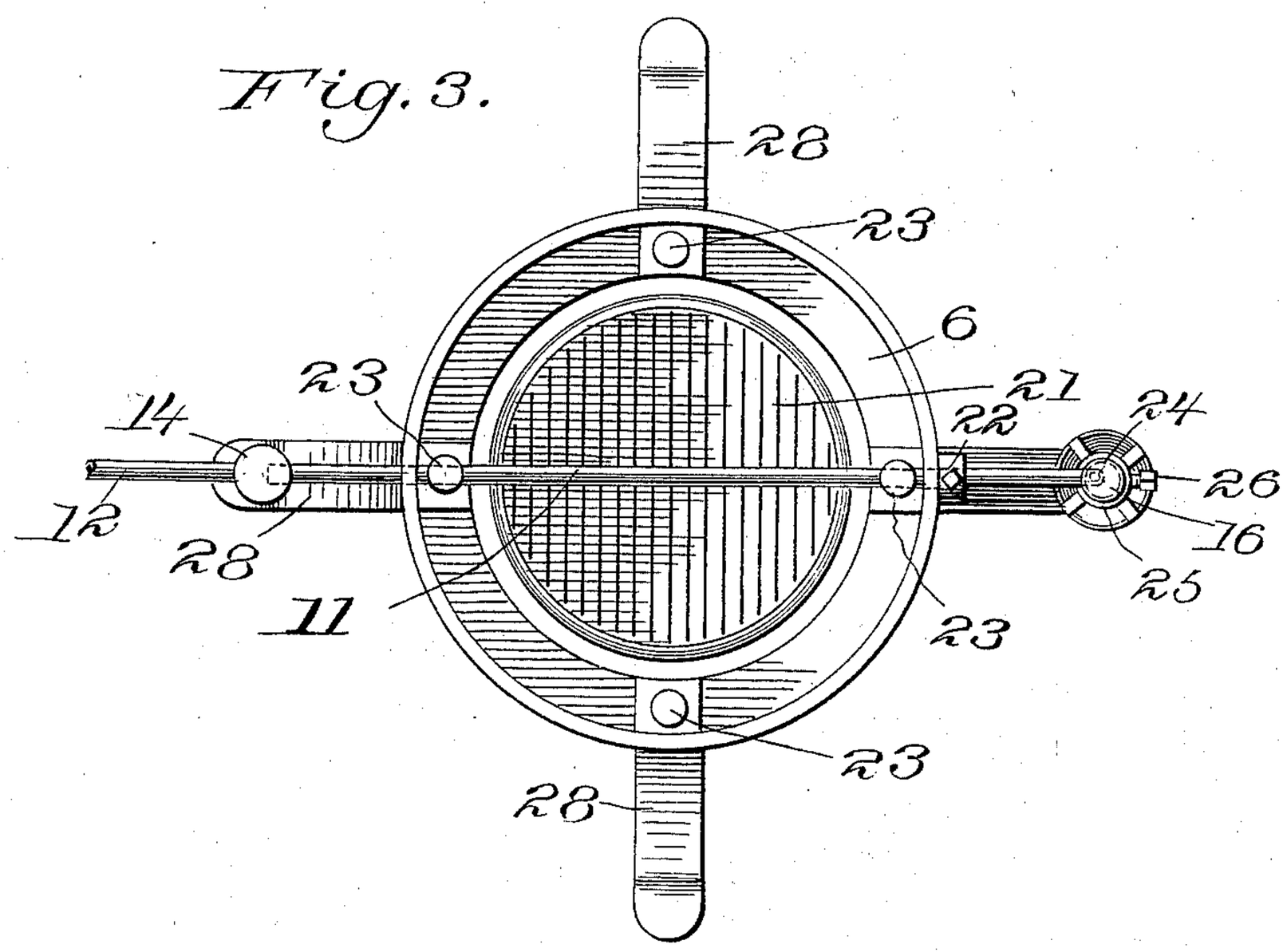


Fig. 3.



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VAPOR-BURNING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 607,996, dated July 26, 1898.

Application filed December 11, 1897. Serial No. 661,531. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR KITSON, a subject of the Queen of Great Britain, residing in Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Vapor-Burning Apparatus, of which the following is a specification.

My invention relates to vapor-burning apparatus, and has for its more specific object the production of an improved apparatus for producing heat or light by burning the vapor of any fluid hydrocarbon, such as kerosene-oil, when mixed with the proper quantity of air to form a combustible compound, which will burn with a blue flame and produce an intense heat.

When the apparatus is to be employed to give light, an incandescent mantle of the general type known as the "Welsbach" mantle is preferably placed over said flame and heated to incandescence thereby.

When the apparatus is to be employed to give heat, the object to be heated is placed immediately over the flame produced as above described.

The preferred form of apparatus embodying my invention is illustrated in the accompanying two sheets of drawings, in which—

Figure 1 is a side elevation and partial section of my improved apparatus arranged to furnish light. Fig. 2 is a side elevation and partial section of my improved apparatus when arranged to furnish heat. Fig. 3 is a plan view of the apparatus shown in Fig. 2.

Throughout the drawings like reference-figures refer to like parts.

1 represents generally any form of vapor-burner, preferably one having the two sets of gauze, as shown. The cup 2 surrounds the burner for holding a mass of asbestos 3 or similar substance into which alcohol may be injected and ignited for the purpose of producing the initial heating of the vaporizing-tube.

2^a is a perforated or skeleton extension of said cup 2, which supports the globe 5, of glass or other translucent material. This globe is preferably made in a cylindrical shape, as shown, although any other form might be employed.

4 represents an ordinary incandescent mantle supported over the burner in any convenient way.

On top of the globe 5 is a small metal ring or other supporting-frame 6, on top of which again is mounted the hood 7, having the porcelain or other reflecting lining of refractory material 8.

The screws 9 9 or other convenient means of attachment fasten the hood to the frame 6. In the center of the hood is the chimney 10 over the burner.

11 represents a vaporizing-tube which is approximately horizontal in the position in which it is supported by the supporting-frame 6. Oil is supplied to this tube through the oil-supply pipe 12, controlled by the valve 13, and in the line of which is placed a strainer 14 of any suitable form, but preferably consisting of an enlargement of the pipe filled with cotton wicking or other fibrous substance. This strainer should be outside of the lamp proper to prevent the charring of the fibrous material by the heat. The other end of the vaporizing-tube is fastened to the supporting-ring 6 in any convenient manner. I have shown it screwed into the threaded boss 15, formed integrally with the frame. Into the other end of said threaded boss is screwed the nozzle 16 for the vaporizing-tube. This nozzle is arranged at an angle to the vaporizing-tube. It is preferably at right angles, as shown, and has a removable cap 17 at the back. In the vaporizing-tube at a point near the end discharging into the nozzle is a dam 18, which may be made in any way found convenient, either as a raised lip, as shown in Fig. 1, or by an upward turning of the end of the tube itself, as shown in Fig. 2, or by other arrangements of the parts which will occur to any skilled mechanic.

19 is the mixing-tube, connected to the burner 1 at the base thereof and extending up adjacent and parallel to the globe 5 on the outer side thereof and terminating in a

mouth or opening opposite the discharging-nozzle 16 of the vaporizing-tube. This vaporizing-tube has an adjustment axially of said nozzle, which may be produced by the threaded extension 20, or by giving such extension a slip-joint, or in any other convenient manner.

In the modified form of my apparatus for producing heat (shown in Figs. 2 and 3) the relation of the parts and their functions are the same. The supporting-ring 6 is, however, in this case supported on a series of short legs 28, and the vaporizing-tube 11 may also be supported in part by the perforated lugs 23 23. The end of the vaporizing-tube nearest the nozzle is fastened to the supporting-frame by the set-screw 22. The ordinary cast-iron burner 21, with slots, (see Fig. 3,) is substituted for the burner shown in Fig. 1, and the upper end or mouth of the mixing-tube 19 is adjusted to and from the nozzle 16 of the vaporizing-tube by means of the elasticity of the mixing-tube 19, and is held in any particular position of adjustment by means of the collar 25 and the set-screw 26. Said collar is connected to the mouth of the mixing-tube by a series of arms 27 27. The lip or dam 18 of Fig. 1 is replaced in Fig. 2 by an upwardly-turned portion 24 on the end of the vaporizing-tube 11.

The mode of operating my invention is evident from the foregoing description. Alcohol or other inflammable fluid being injected into the mass of asbestos 3 is lighted and the heat of the flame raises the vaporizing-tube 11 to the temperature necessary to vaporize the oil. The valve 13 is then opened and the oil oozes through the strainer 14 into the approximately horizontal vaporizing-tube 11 and running along the under side thereof is rapidly vaporized. The vapor passes out into the nozzle 16 and is discharged downwardly into the mixing-tube 19, entraining the necessary amount of air to form a combustible mixture, which is delivered to the burner and burned in the incandescent mantle 4 or under the kettle or other object placed on the supporting-ring 6 of the apparatus shown in Fig. 2. The kettle or other object to be heated may rest on the lugs 23 23. The vaporizing-tube being rigidly held only at the end nearest the nozzle is free to expand and contract by moving the other end without disturbing the adjustment of the nozzle with reference to the mixing-tube. The amount of air taken in is regulated by adjusting the movable slide 20 on the end of the mixing-tube, as shown in Fig. 1, or by bending the tube upward in the arrangement shown in Fig. 2 and clamping it in the desired position by means of the set-screw 26.

When the nozzle is to be cleaned, the cap 17 is removed and a wire pushed down through the nozzle. It is understood, of course, that after the supply of vapor reaches the burner the alcohol-flame may be allowed to burn out and the action of the apparatus becomes self-supporting.

The advantages of my invention consist in the compact arrangement of the apparatus and the consequent non-liability of the parts to displacement, the freedom of expansion of the vaporizing-tube without disarranging the adjustment of the parts, the removing of the fibrous strainer from the heating-zone of the burner, and in the complete evaporation of the oil by reason of the length of vaporizing-tube exposed in the heating-zone.

The great practical advantage of the apparatus, however, consists in doing away with the needle-valve common in this type of apparatus by means of employing the approximately horizontal vaporizing-tube and the dam near the nozzle for the purpose of preventing the oil from running over into the discharge-nozzle whenever a surplus of oil is delivered through the tube.

The needle-valve I have found to be a source of continual trouble, as particles of foreign matter, carbon, and the like deposit and burn on it and interfere with the evenness of the discharging-jet and the regulation thereof.

The construction above described also reduces the first cost of the apparatus and heightens the convenience of taking it apart for repairs, &c.

By removing the hood 7 the nozzle shown in Fig. 1 can be quickly unscrewed or the cap removed for cleaning. The vaporizing-tube 11 can also be unscrewed and removed or replaced.

There is but little bending to be done on the mixing-tube 19, and said tube by lying close to the globe is not so liable to be struck and bent out of position. In the arrangement shown in Fig. 2 the method of taking the apparatus apart would be to loosen the set-screw 26, spring the mixing-tube 19 down, unscrew the vaporizing-tube 11 from the strainer 14, and pull it out of the supporting-ring, the set-screw 22 having been first loosened, of course.

Evidently various changes could be made in the details of construction illustrated and described without departing from the spirit of my invention so long as the relative arrangement of parts shown in the drawings and the mode of operation described in the specification are adhered to.

Having therefore described my invention, what I claim as new, and desire to protect by Letters Patent, is—

1. In a vapor-burning apparatus the combination of the approximately horizontal vaporizing-tube, the nozzle for said tube, and the upwardly-turned end of the vaporizing-tube which delivers vapor into the nozzle, substantially as described.

2. In a vapor-burning apparatus the combination of the burner, the supporting-frame, the mixing-tube having its mouth located at

one side of said frame, the vaporizing-tube mounted in the frame, extending through the heating-zone of the burner and discharging into the mixing-tube, said vaporizing-tube being fastened to the frame only at a point near its discharging end, substantially as described.

In testimony whereof I have hereunto affixed my signature in the presence of two witnesses.

ARTHUR KITSON.

Witnesses:
A. PARKER SMITH,
LILIAN FOSTER.