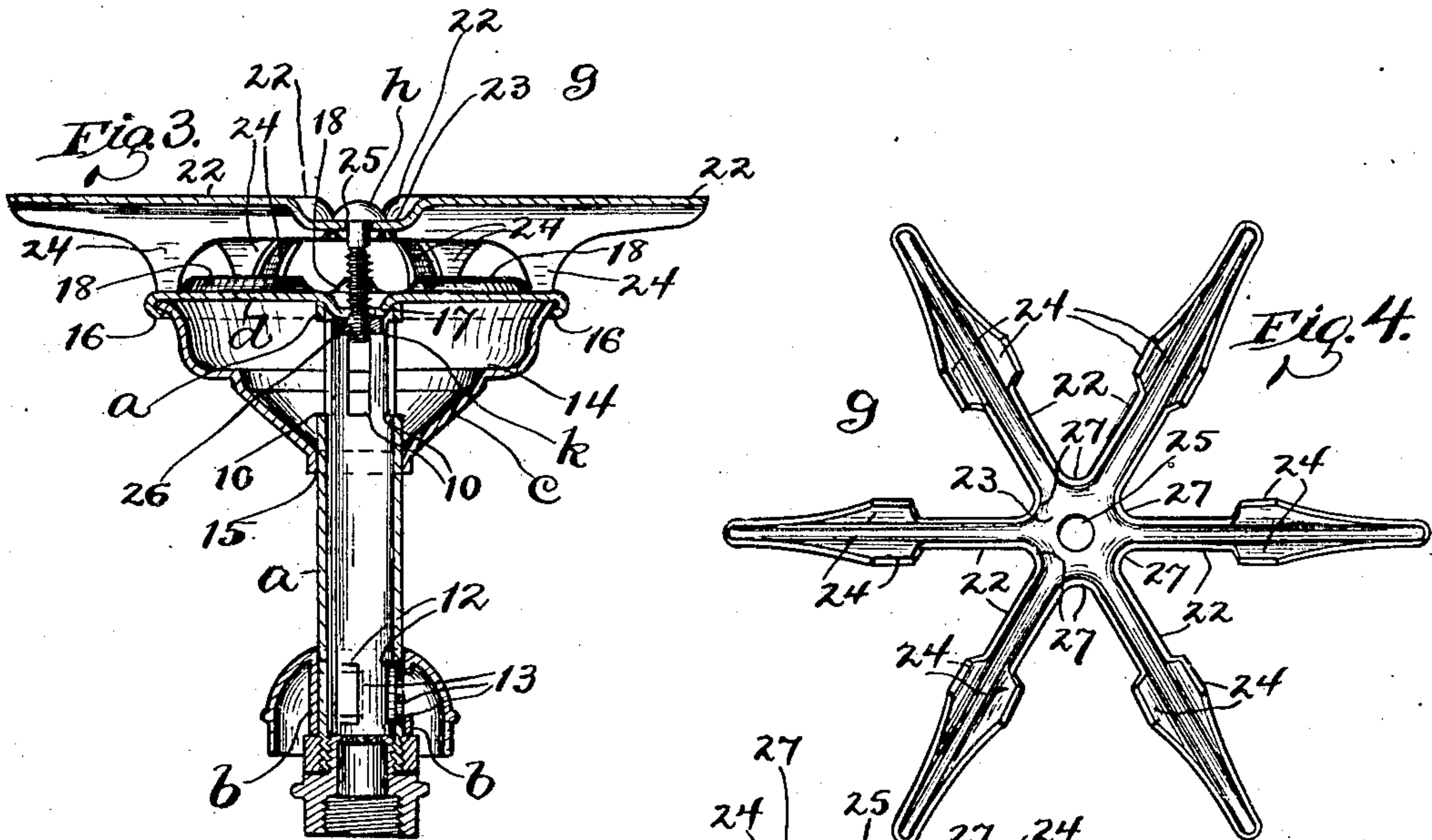
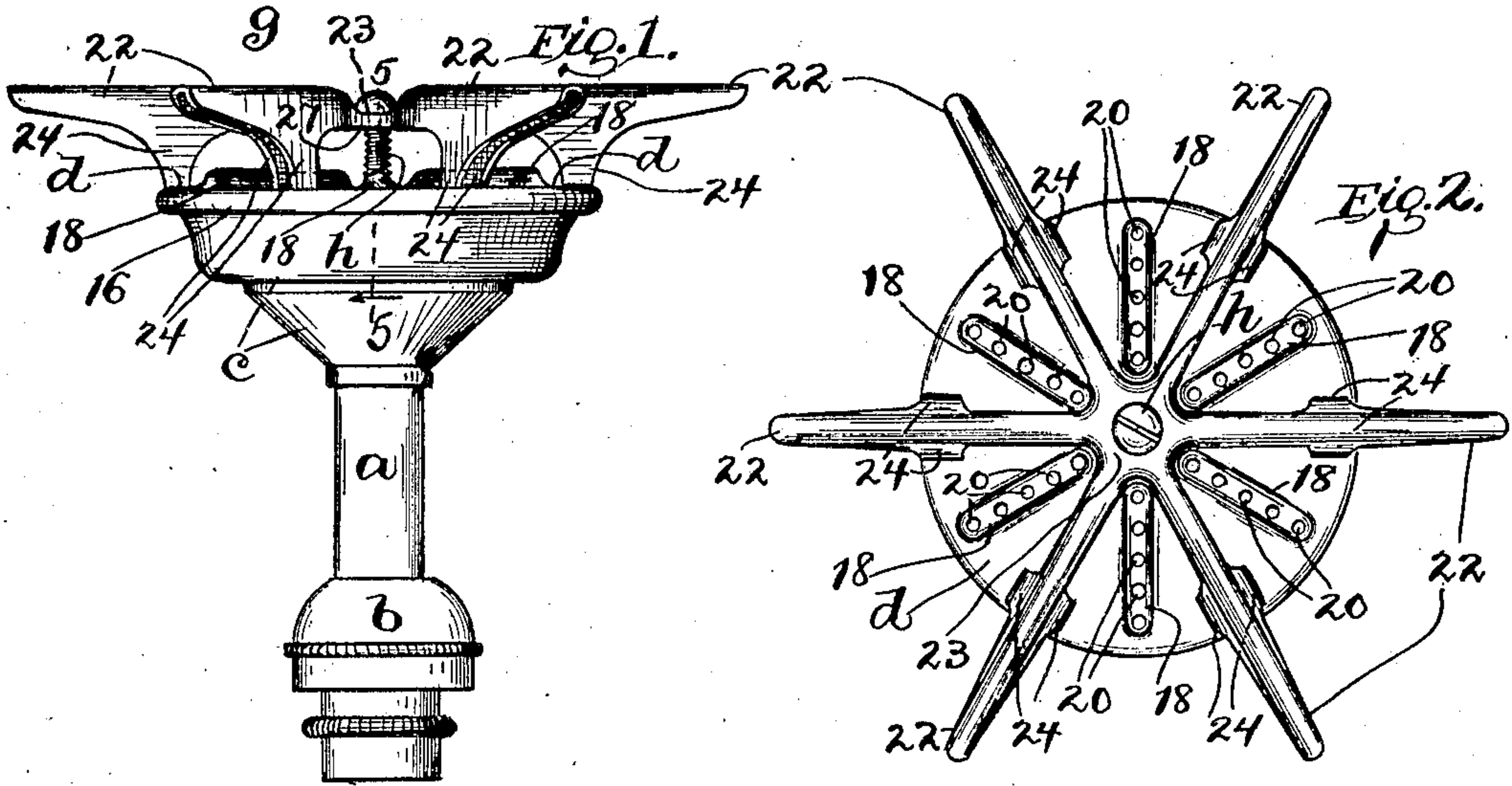


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PATENTED APR. 9, 1907.

F. G. NICOLAUS.
HEATING GAS BURNER.
APPLICATION FILED MAY 20, 1905.



WITNESSES:
Daniel E. Daly.
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Fig. 5 is a side elevation of the burner assembly, similar to Fig. 1 but with a different port arrangement. It shows the burner head (9) with a central jet (23) and a surrounding ring of ports (18). The burner is mounted on a vertical pipe (a) which has a flange (b) at the bottom. Various parts are labeled with numbers: 22, 24, 18, 16, 5, 21, 27, 20, 25, 26, 14, 15, 12, 13, 17, 10, 11, 19, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

Fig. 6 is a top plan view of the burner head (9), showing the arrangement of the ports (18) and the central jet (23). The ports are arranged in a circular pattern around the central jet. The burner head is shown with its various components and their relative positions.

INVENTOR
Frederic G. Nicolaus
BY
[Signature]
his ATTORNEYS

UNITED STATES PATENT OFFICE.

FREDERIC G. NICOLAUS, OF CLEVELAND, OHIO.

HEATING GAS-BURNER.

No. 849,634.

Specification of Letters Patent.

Patented April 9, 1907.

Application filed May 20, 1905. Serial No. 261,427.

To all whom it may concern:

Be it known that I, FREDERIC G. NICOLAUS, a citizen of the United States of America, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Heating Gas-Burners; and I hereby 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 pertains to make and use the same.

This invention relates to improvements in stove-forming or heating gas-burners designed to be mounted on a gas-fixture—such, for instance, as a gas-bracket—and more especially suitable for use in nurseries or any place where an ordinary stove would be in the way or otherwise objectionable.

One object of this invention is to provide a burner or heater of the character indicated which is simple and durable in construction and convenient.

Another object is to provide a burner or heater in which substantially perfect combustion is attained.

With these objects in view and to the end of realizing other advantages hereinafter appearing this invention consists in certain features of construction and combinations of parts hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a heating gas-burner embodying my invention. Fig. 2 is a top plan of the same. Fig. 3 is a central vertical section. Fig. 4 is a bottom plan of the spider of the burner detached. Fig. 5 is a vertical section on line 5 5, Fig. 1.

My improved heating gas-burner comprises a vertically-arranged metal tube *a*, which is adapted to be connected at its lower end with a gas-supply pipe in any approved manner. The tube *a* is provided near its upper end with lateral slots or holes 10, which are arranged at suitable intervals circumferentially of the tube and form the outlets of the tube.

The tube *a* is provided near its lower end with lateral slots or holes 12, arranged at suitable intervals circumferentially of the tube and forming the air-inlets of the tube.

A valve-forming sleeve *b* turnably embraces the lower portion of the tube *a* and is provided with lateral slots 13, adapted to

register with the air-inlets 12 of the tube, and obviously the supply of air to be mixed with the gas conducted into and through the tube *a* is regulated by turning the sleeve *b* more or less, as required.

The tube *a* above the air-supply regulator extends through the bottom of a chamber 14, which surrounds the upper portion of the tube *a* and is in communication with the lateral outlets 10 of the said tube. The chamber 14 is formed in the main by a bowl-shaped section *c*, of sheet-steel. The section *c* is provided at the bottom and centrally with an aperture 15, engaged by the tube *a*. The tube *a* extends through the aperture 15 to and into contact with the top wall of the chamber 14, which wall is formed by a cap *d*, of sheet-steel. The upper end of the section *c* flares somewhat upwardly, and the cap *d* is provided with a depending annular flange 16, which projects in under the flaring upper end of and is thereby held down upon the section *c*.

The cap *d* is depressed centrally, as at 17, into the upper end of the tube *a*. The depressed portion 17 of the cap *d* snugly fits internally of the upper end of the tube *a* and centers the said tube relative to the chamber 14—that is, the depressed portion 17 of the cap *d* is arranged exactly in line vertically with the aperture 15 in the section *c*, so that when during the assemblage of the parts the tube *a* is slid through the said aperture into position embracing the depressed portion 17 of the cap *d* the tube is arranged exactly vertically and centrally of the chamber 14.

The cap *d* is provided with several narrow raised portions 18, arranged radially of the cap and spaced equidistantly circumferentially of the tube *a*, and each raised portion 18 is provided in the top thereof with orifices 20, spaced equidistantly longitudinally of the said raised portion. Each raised portion 18 forms a correspondingly-arranged recess 19 in the under side of the cap *d*, as shown in Fig. 5, and the raising of the orifices 20 above the main upper surface of the cap *d* is desirable because the supply of air to and around the raised portions 18 of the cap is accommodated and required to support proper combustion in the flames issuing from the orifices 20 during the operation of the burner.

A spider *g* (shown detached in Fig. 4) is mounted on the cap *d* and is composed of a

single piece of sheet-steel. The spider *g* has as many inverted-U-shaped arms 22 as there are raised portions 18 on the cap *d*. The arms 22 are arranged radially of the cap *d* and spaced equidistantly around the central depressed portion 17 of the said cap. The arms 22 alternate with the raised portions 18 of the cap *d*, and preferably each arm 22 is arranged centrally between the two adjacent raised portions 18 of the cap.

The spider-arms 22 are connected together at their inner ends by a web 23; but, as already indicated, the arms 22 and the web 23 consist of a single piece of sheet-steel stamped into the shape required to form the said web and the said arms.

To hold the spider in the main a suitable distance above the cap *d*, the arms 22 of the spider are provided with downwardly-projecting members 24 centrally between the ends of the arms, and preferably each arm 22 is provided with two downwardly-projecting members 24, formed at and depending from opposite longitudinal edges, respectively, of the said arm and diverging downwardly.

The spider is secured to the cap *d*, preferably removably. Simple and inexpensive means for attaching the spider to the cap comprises a screw *h*, which is arranged vertically centrally of the web 23 and extends loosely through a hole 25, formed in the web 23, and through a hole 26, formed in and centrally of the depressed portion 17 of the cap *d* into the upper end of the tube *a* and is arranged with its head at the upper side of the web, which is depressed below the inner ends of the arms 22 far enough to prevent the projection of the head of the screw above the said ends of the said arms. A correspondingly-screw-threaded nut *k* is mounted on the shank of the screw *h* at the under side of the depressed portion 17 of the cap *d* and within the tube *a*.

The web 23 to reinforce or strengthen the same is provided with downwardly-projecting flanges 27 between the arms 22, as shown in Figs. 4 and 5.

The operation of my improved heating-burner will be readily understood. The gas and air conducted by the tube *a* to the chamber 14 communicate or mix in the said tube and chamber, and the inflammable mixture rises from the chamber into the recesses 19 and thence escapes through the orifices 20, where it is ignited. The spider *g* constitutes a desirable support for a vessel in which food or liquid is to be cooked or heated, and the parts *c*, *d*, and *g* of the burner can be removed together from the tube *a* to accommodate the application to the said tube of a mantle-burner.

I would also remark that the arms 22 of the spider *g* are long enough to project a suitable distance outwardly beyond the flange 16 or

the cap *d*, and the downwardly-projecting member 24 of the said arms rest upon the cap *d* near the said flange.

What I claim is—

1. A heating-burner comprising a bowl-shaped section having its upper end flaring upwardly; a cap provided with a depending annular flange which projects in under the upper flaring end of and surrounds the bowl-shaped section, said cap having radially-arranged raised portions spaced around the central portion of the cap, with each raised portion of the cap provided with orifices which are in communication with the chamber formed interiorly of the bowl-shaped section and spaced longitudinally of the said raised portion; a gas-conducting tube discharging into the aforesaid chamber, and a spider mounted on and attached to the cap and having arms arranged radially of the cap and alternating with the raised portions of the cap, which arms are connected together at their inner ends and have downwardly-projecting members which raise the spider in the main above the cap.

2. In a heating-burner, the combination, with a chamber having a top wall which has perforated raised portions spaced around the central portion of the wall, and a gas-conducting tube discharging into the said chamber, of a spider arranged above and externally of the said chamber and having laterally-extending arms spaced around the central portion of the aforesaid wall, said arms having downwardly-projecting members and connected together at their inner ends by a web which is arranged above the central portion of the wall, and means attaching the spider at the web to the said wall.

3. The combination of a bowl-shaped section instrumental in forming a chamber and provided at the bottom and centrally with an aperture; a cap forming the top wall of the said chamber and attached to the bowl-shaped section, said cap having a central depressed portion and provided with raised portions which are spaced around the depressed portion of the cap and have orifices in communication with the aforesaid chamber; a gas-conducting tube extending through the aforesaid aperture and around the aforesaid depressed portion of the cap and having lateral holes which are formed in its upper portion and communicate with the said chamber, and a spider mounted on and attached to the cap and having radially-arranged arms spaced around the depressed portion of the cap, which arms are connected together at their inner ends and have downwardly-projecting members arranged to raise the spider in the main above the cap.

4. In a heating-burner, the combination, with a gas-receiving chamber, said chamber having a top wall which has a central depressed

portion and is perforated around the depressed portion, of a spider arranged above and externally of the said chamber and having laterally-extending arms spaced around the depressed portion of the aforesaid wall, said arms having downwardly-projecting members and connected together at their inner ends by a web; a screw extending through the web and through the depressed portion of the said wall and arranged with its head at the outer side of the said wall, and a nut mounted on the shank of the screw at the inner side of the said wall, and the aforesaid web being arranged low enough to accommodate the location of the head of the screw below the inner ends of the spider-arms.

5. In a heating-burner, the combination, with a chamber having a top wall which has perforated raised portions spaced around the central portion of the wall, and a gas-conducting tube discharging into the said chamber, of a spider arranged above and externally of the said chamber and having laterally-extending arms spaced around the central portion of the aforesaid wall, said arms having downwardly-projecting members and connected together at their inner ends by a web which is arranged above the central portion of the wall and flanged downwardly between the arms, and means removably attaching the spider at the web to the said wall.

6. In a heating-burner, the combination, with a chamber having a top wall which is perforated around the central portion of the wall, and a gas-conducting tube discharging into the said chamber, of a spider arranged above and externally of the said chamber and having laterally-extending arms spaced around the central portion of the aforesaid wall, said spider being formed of a single piece of sheet metal and removably held in place, with the arms of the spider provided with downwardly-projecting members and connected together at their inner ends by a web which is arranged above the central portion of the aforesaid wall.

7. In a heating-burner, the combination, with a chamber having a bottom provided centrally with an aperture, said chamber also having a top wall which has a central depressed portion and perforated raised portions spaced around the depressed portion, and a gas-conducting tube extending through the aforesaid aperture and around the depressed portion of and into contact with the aforesaid wall and having an outlet communicating with the aforesaid chamber, of a spider arranged above and externally of the said chamber and having radially-arranged arms spaced around the depressed portion of the aforesaid wall, said arms having downwardly-projecting members and connected together at their inner ends by a web arranged

above the depressed portion of the wall; a screw extending through the web and through the depressed portion of the said wall into the aforesaid tube and arranged with its head at the outer side of the said wall, and a nut mounted on the shank of the screw within the tube, and the aforesaid web being depressed far enough to accommodate the location of the head of the screw below the inner ends of the spider-arms.

8. In a heating-burner, the combination, with a chamber having a top wall which has perforated raised portions spaced around the central portion of the wall, and a gas-conducting tube discharging into the said chamber, of a spider arranged above and externally of the said chamber and having radially-arranged arms spaced around the central portion of the aforesaid wall, said arms having downwardly-projecting members and connected together at their inner ends by a web which is arranged above the central portion of the wall and flanged downwardly between the arms; a screw extending through the web and through the depressed portion of the said wall and arranged with its head at the outer side of the said wall, and a nut mounted on the shank of the screw at the inner side of the said wall.

9. In a heating-burner, the combination, with a chamber having a top wall which has perforated raised portions spaced around the central portion of the wall; and a gas-conducting tube discharging into the said chamber, of a spider arranged above and externally of the said chamber and having radially-arranged arms spaced around the central portion of the aforesaid wall, said arms having downwardly-projecting members and connected together at their inner ends by a web which is arranged above the central portion of the wall and flanged downwardly between the arms; a screw extending through the web and through the depressed portion of the said wall and arranged with its head at the outer side of the said wall, and a nut mounted on the shank of the screw at the inner side of the said wall, and the aforesaid web being depressed far enough to accommodate the location of the head of the screw below the inner ends of the spider-arms.

10. In a heating-burner, the combination, with a chamber having a perforated top wall, and means for conducting an inflammable fluid to the said chamber, of a spider composed of a single piece of sheet-steel and arranged above and externally of the said chamber and attached to the aforesaid wall, said spider having radially-arranged arms which are spaced around the central portion of the said wall and have downwardly-projecting members arranged to rest upon the said wall.

11. In a heating-burner, the combination, with a chamber having a perforated top wall,

and a gas-conducting tube discharging into
the chamber, of a spider arranged above and
externally of the chamber and having radi-
ally-arranged arms spaced around the cen-
5 tral portion of the aforesaid wall, and each
spider-arm being provided with two down-
wardly-diverging members projecting down-
wardly at opposite longitudinal edges re-

spectively of the arm and over the aforesaid
chamber. 10

In testimony whereof I sign the foregoing
specification in the presence of two witnesses.

FREDERIC G. NICOLAUS.

Witnesses:

C. H. DORER,
B. C. BROWN.