

J. W. CARTER.

GAS HEATER.

APPLICATION FILED OCT. 27, 1902.

NO MODEL.

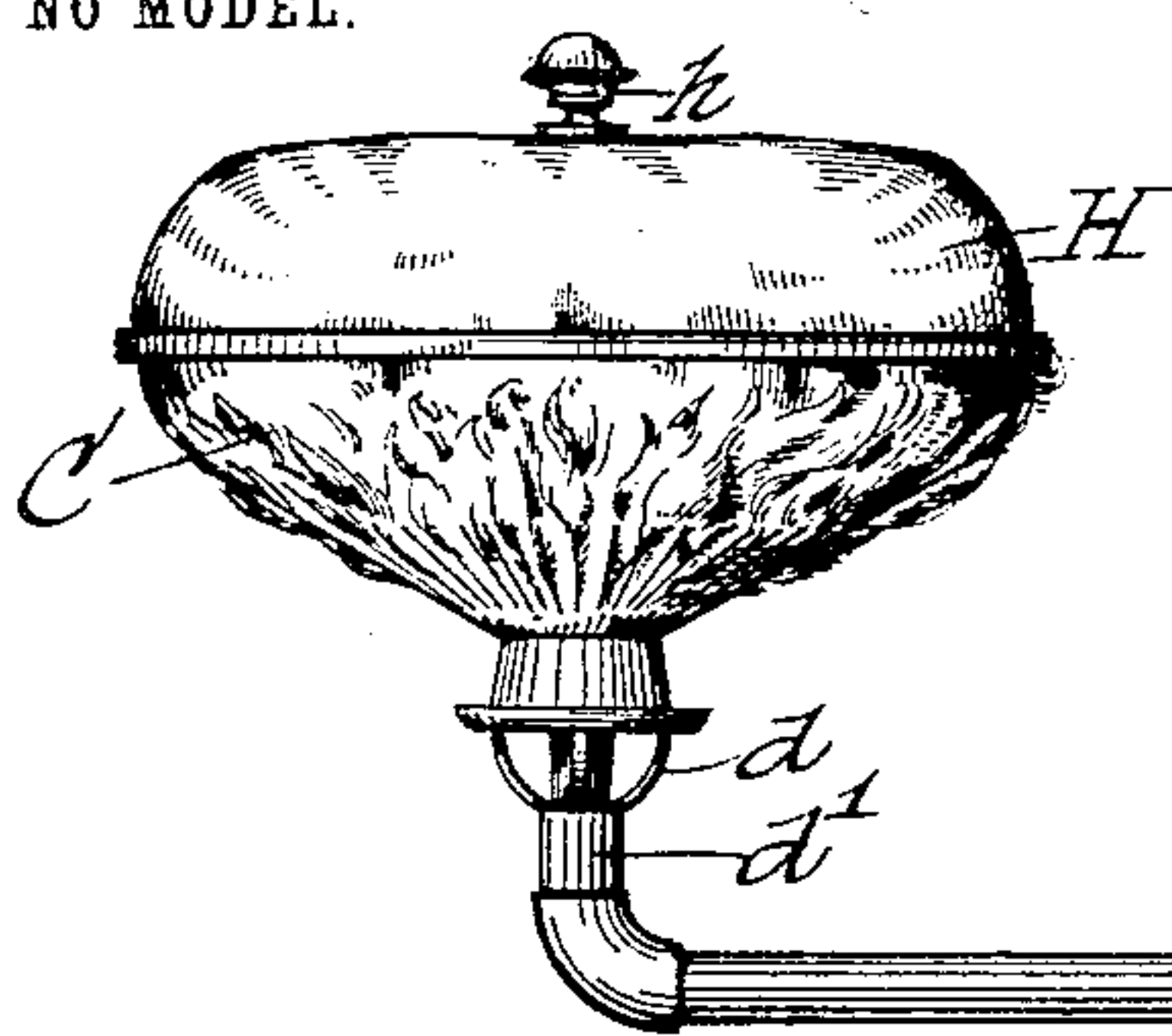


Fig: 1.

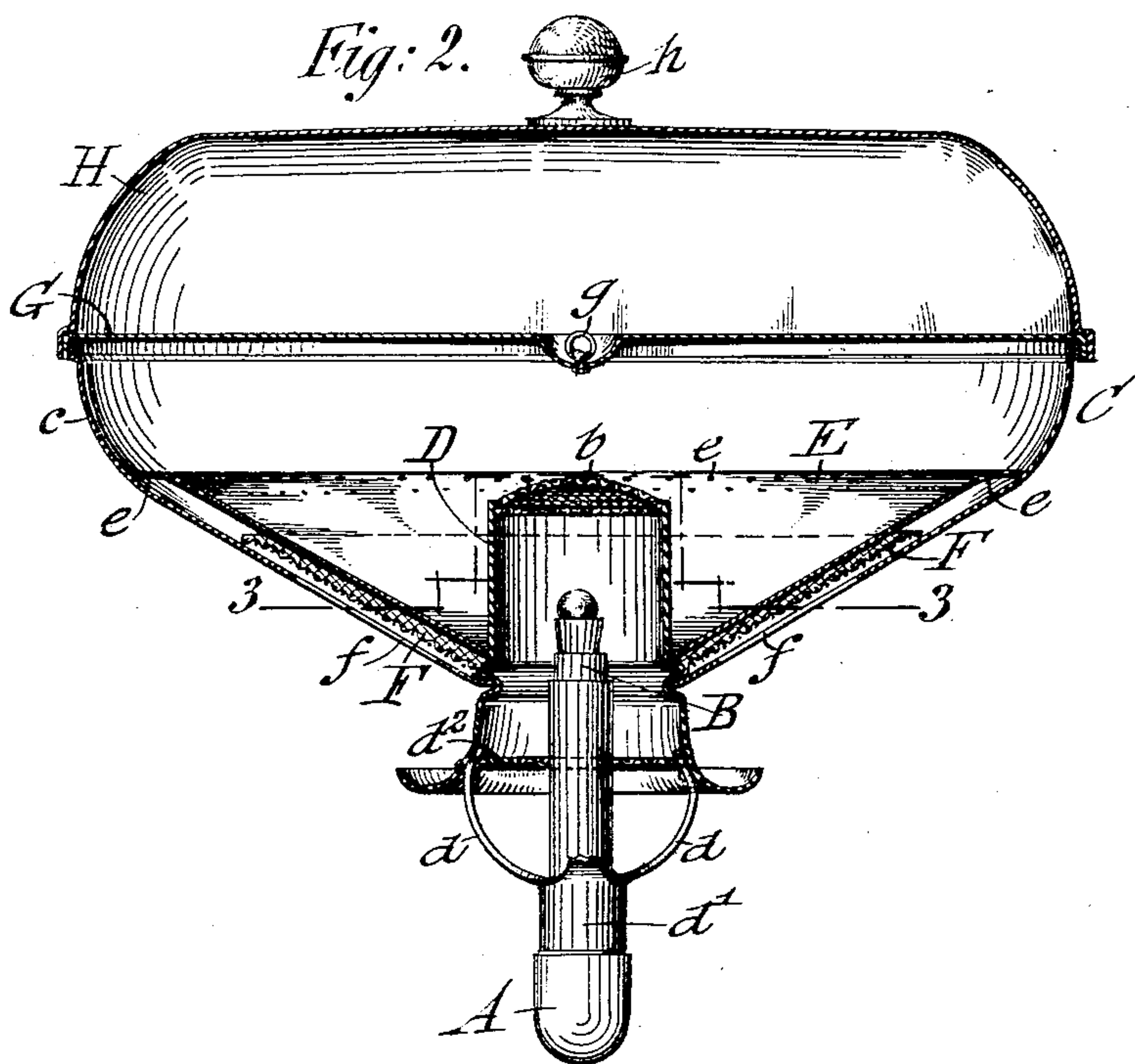


Fig: 2.

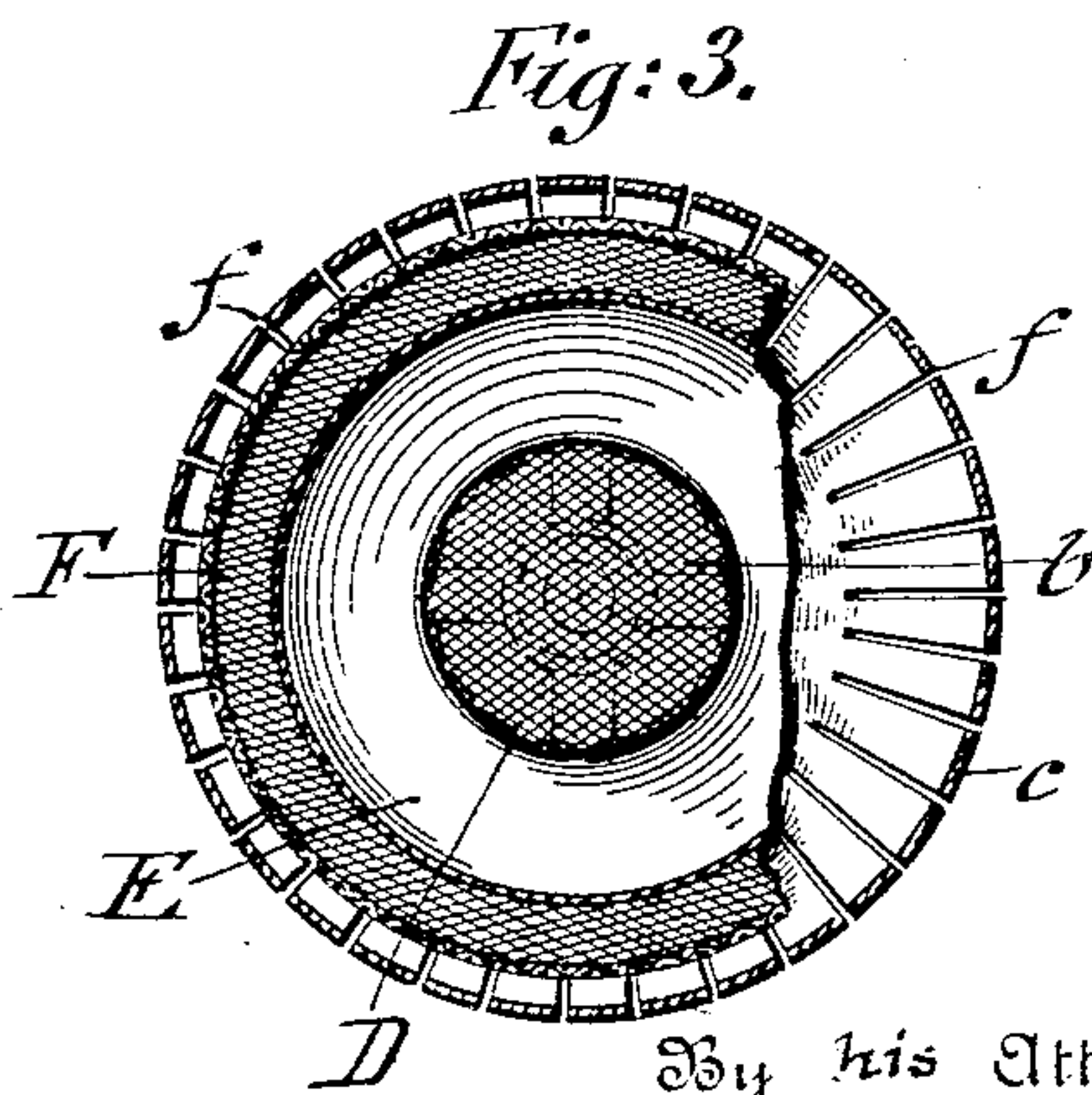


Fig: 3.

Witnesses  
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By his Attorneys

Inventor  
John W. Carter,  
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# UNITED STATES PATENT OFFICE.

JOHN W. CARTER, OF NUTLEY, NEW JERSEY.

## GAS-HEATER.

SPECIFICATION forming part of Letters Patent No. 735,063, dated August 4, 1903.

Application filed October 27, 1902. Serial No. 128,925. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN W. CARTER, a citizen of the United States, residing in Nutley, in the county of Essex, State of New Jersey, have invented certain new and useful Improvements in Gas-Heaters, of which the following is a specification.

The object of this invention is to provide in a gas-heater of the type in which the flame or flames issue in downward direction and thence pass upwardly at the outside of the heater means whereby a rapid and complete mixing of the air and gas for burning is accomplished and at the same time means whereby the liability of the flame to strike back into the heater is reduced.

The invention consists of a gas-heater comprising a hollow shell, means for delivering a mixture of gas and air into said shell, jet-openings in the bottom of said shell, a screen covering said jet-openings, and a baffle-plate provided with openings at or near its edge and arranged between said screen and the inlet of the gas and air mixture into the shell.

The invention consists, further, in certain details of construction and combinations of parts, which will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view of a gas-heater constructed according to my invention and supported upon a gas-arm. Fig. 2 is a detail central section through the heater; and Fig. 3 is a horizontal section on line 3 3, Fig. 2.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A indicates a gas-arm of the usual type projecting from a wall or other suitable support.

B indicates a burner-tip, which may be of the usual form.

C is the shell of the gas-heater, which is preferably formed of sheet metal and composed of a body portion *c* and a top G. The body portion is in cup or dish shape and is provided at its lower portion near the center or apex with jet-openings in the form of radiating slits *f* for the gas to be burned. The top G of the shell is preferably made flat, as shown, and is secured tightly and permanently over the body *c* of the shell, thereby

closing the same at the upper part. At its lower portion or apex the body *c* of the shell is connected to an inlet-tube D, which extends from the outside of the heater through the shell to approximately the middle of the shell-chamber. The inlet-tube supports the shell and upper parts of the heater and is itself supported on the gas-arm A by means of a suitable bracket or tripod having the socket *d'* and arms *d*. Across the lower portion of the inlet-tube is arranged a screen *d*<sup>2</sup> for minimizing the influence of drafts or gusts of wind in the air about the heater, and thereby securing the steady burning of the same. A second or mixing screen *b* is arranged in the inlet-tube above the gas-tip B. This screen is for the purpose of finely dividing, and thereby causing the thorough mixture, of the gas and air entering the shell-chamber and also in connection with the draft-screen *d*<sup>2</sup> for insuring the steady flow of the gas and air mixture into the shell.

Adjacent to the bottom of the shell C is located a screen F, which covers the jet-openings *f* of the shell and is preferably arranged closely thereto, as shown. Over the screen—that is to say, between the same and the upper end of the inlet-tube D—is arranged a baffle-plate E. This plate is preferably a closed plate, with the exception that it is provided with a number of fine perforations arranged at or near the circumference of the same. The baffle-plate E is preferably dished, as shown, so as to lie adjacent the bottom of the shell, and thereby form a mixing-chamber between the same and the shell, this mixing-chamber being of comparatively little depth but considerable area and presenting a large exposed surface of metal to the gas within the same.

The heater may be provided with a cover H, of any suitable form, which is removable therefrom, the same being lifted off and replaced at will by means of its handle *h*. When removed, the top G of the heater is exposed, and as the same is perfectly flat a vessel of any desired size may be placed thereon for heating. The top G is provided, preferably at its center, with a socket or recess, in which is located a small ring *g*, which does not project above the top. By means of this ring



the heater may be conveniently handled, even when in heated condition, by any suitable metallic hook, such as a button-hook or other device. This ring *g* serves also as means for readily hanging the heater on a nail or other suitable support when not in use.

The perforations *e* of the baffle-plate are preferably arranged beyond the outer edge of the screen *F*, as shown, and the screen is preferably provided with a downturned edge at its circumference, so as to raise the screen slightly from the bottom of the shell *P*. The gas issues from the burner-tip *B*. Air enters through the inlet-tube *D*, mixes in the inlet-tube with the gas, and passes with the same through the screen *b* into the interior of the shell above the baffle-plate. During their passage through the inlet-tube and the interior of the shell the gas and air mix, and the mixture is again subdivided by the baffle-plate. It then issues into the flat chamber between the baffle-plate and the shell below the same and mixes still more thoroughly in said chamber and becomes further heated by reason of the flame beneath. The mixture then passes through the screen *F*, whereby it is still further caused to be subdivided. After leaving the screen it passes almost immediately through the slits *f* of the shell and burns as it issues from the same. By reason of the thorough mixture to which the gas and air are subjected and the preliminary heating of the same in the heating-chamber between the baffle-plate and screen the combustibility of the mixture is largely increased, so that even gas of poor quality yields a flame of intense heat and perfect combustion. The screen *F* assists in the preliminary heating and in connection with the small depth of the mixing-chamber effectually prevents the striking back of the flame into the heater.

It is obvious that in place of the numerous small openings near the edge of the baffle-plate the edge of the plate itself may be notched, thereby forming these openings directly at the edge of the plate between the same and the shell of the heater, or the plate may be slightly raised at its edge from the shell, so as to form a fine slit through which the gas and air mixture may enter the heating-chamber. It is also obvious that in place of slits *f* the jet-openings of the shell may be of any desired form—for example, fine perforations distributed promiscuously or arranged in any suitable manner in the bottom of the shell.

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

1. A gas-heater, consisting of a hollow shell or body, provided at its lower part or bottom with jet-openings, a baffle-plate arranged in the shell adjacent the bottom of the same and covering said jet-openings, whereby a mixing and heating chamber of large area and little depth is formed between said shell and baffle-plate, said baffle-plate having openings at or near its edge, a screen in said mix-

ing-chamber between the baffle-plate and shell-bottom, and also covering said jet-openings, and an inlet-tube extending through the bottom of the shell, the screen and the baffle-plate for delivering the gases for combustion into the interior of the shell, substantially as set forth.

2. A gas-heater, consisting of a hollow shell or body, provided at its lower part or bottom with jet-openings, a baffle-plate arranged in the shell adjacent the bottom of the same and covering said jet-openings, whereby a mixing and heating chamber of large area and little depth is formed between said shell and baffle-plate, said baffle-plate having openings at or near its edge, a screen in said mixing-chamber between the baffle-plate and shell-bottom and also covering said jet-openings, an inlet-tube extending through the bottom of the shell, the screen and the baffle-plate for delivering the gases for combustion into the interior of the shell, said inlet-tube being adapted to receive a suitable burner, and a screen arranged in said tube above the burner, substantially as set forth.

3. A gas-heater, consisting of a hollow shell or body, provided at its lower part or bottom with jet-openings, a baffle-plate arranged in the shell adjacent the bottom of the same and covering said jet-openings, whereby a mixing and heating chamber of large area and little depth is formed between said shell and baffle-plate, said baffle-plate having openings at or near its edge, a screen in said mixing-chamber between the baffle-plate and shell-bottom and also covering said jet-openings, an inlet-tube extending through the bottom of the shell, the screen and the baffle-plate for delivering the gases for combustion into the interior of the shell, said inlet-tube being adapted to receive a suitable burner, a screen arranged in said tube above the burner and a screen arranged in the lower portion of said tube, substantially as set forth.

4. A gas-heater, consisting of a hollow shell or body, provided at its lower part or bottom with jet-openings, a baffle-plate arranged in the shell adjacent the bottom of the same and covering said jet-openings, whereby a mixing and heating chamber of large area and little depth is formed between said shell and baffle-plate, said baffle-plate having openings at or near its edge, a screen in said mixing-chamber between the baffle-plate and shell-bottom and also covering said jet-openings, said screen being of less diameter than the baffle-plate and the openings of the latter arranged beyond the edge of the screen, and an inlet-tube extending through the bottom of the shell, the screen and the baffle-plate for delivering the gases for combustion into the interior of the shell, substantially as set forth.

5. A gas-heater, consisting of a hollow shell or body provided at its lower part or bottom with jet-openings, a baffle-plate arranged in the shell adjacent the bottom of the same and covering said jet-openings, whereby a mixing



and heating chamber of large area and little  
depth is formed between said shell and baffle-  
plate, said baffle-plate having openings at or  
near its edge, a screen in said mixing-cham-  
5 ber between the baffle-plate and shell-bottom,  
and also covering said jet-openings, and an  
inlet-tube connected with said shell and ar-  
ranged for delivering the gases for combus-  
tion into the interior of the same at the up-

per side of the baffle-plate, substantially as is  
set forth.

In testimony that I claim the foregoing as  
my invention I have signed my name in pres-  
ence of two subscribing witnesses.

JOHN W. CARTER.

Witnesses:

JOSEPH H. NILES,

HENRY J. SUHRBIER.