

No. 766,153.

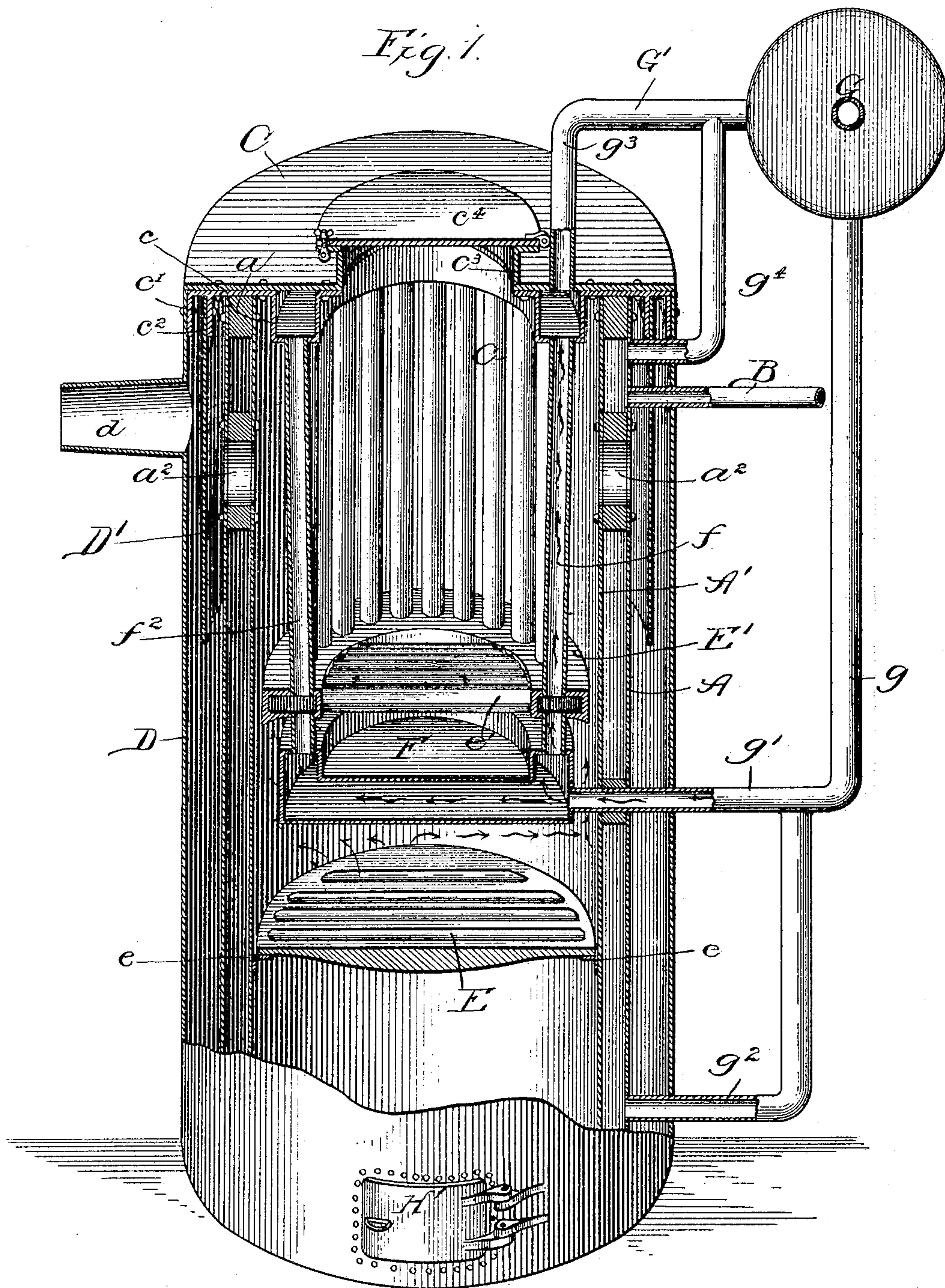
PATENTED JULY 26, 1904.

G. W. MATHEWS.
HEATER AND GARBAGE BURNER.

APPLICATION FILED SEPT. 24, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



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3 SHEETS—SHEET 2.

Fig. 2.

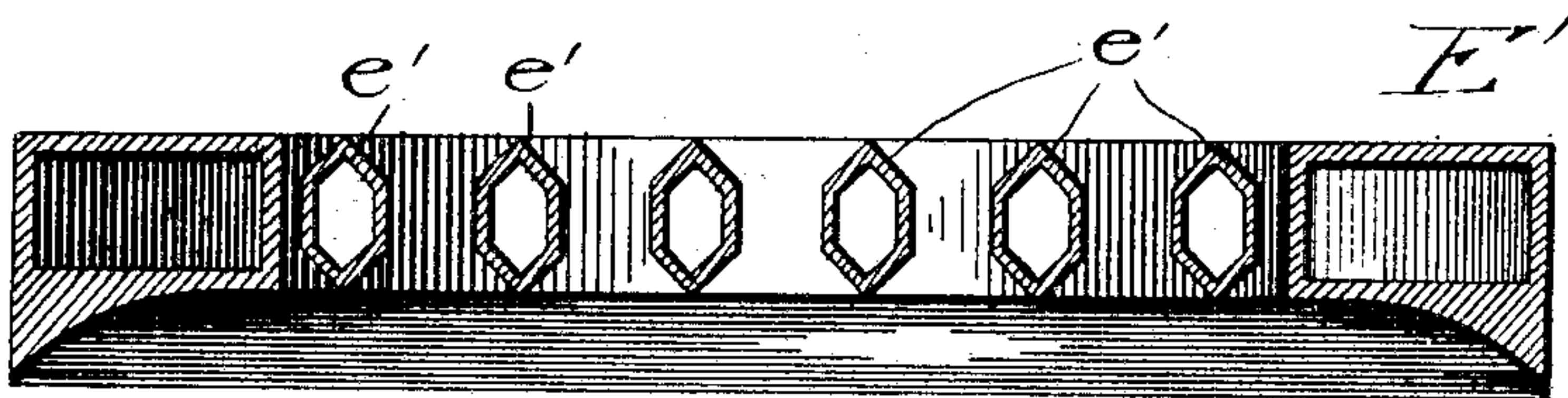


Fig. 3.

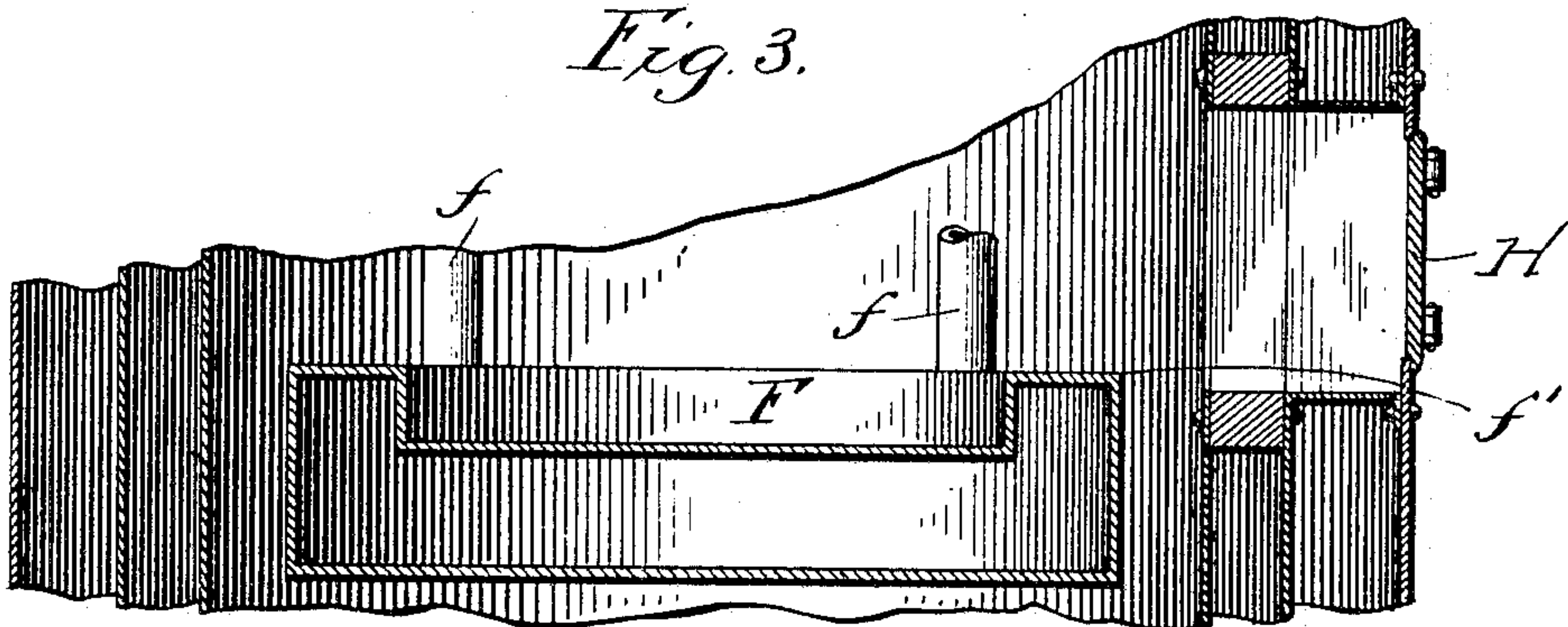
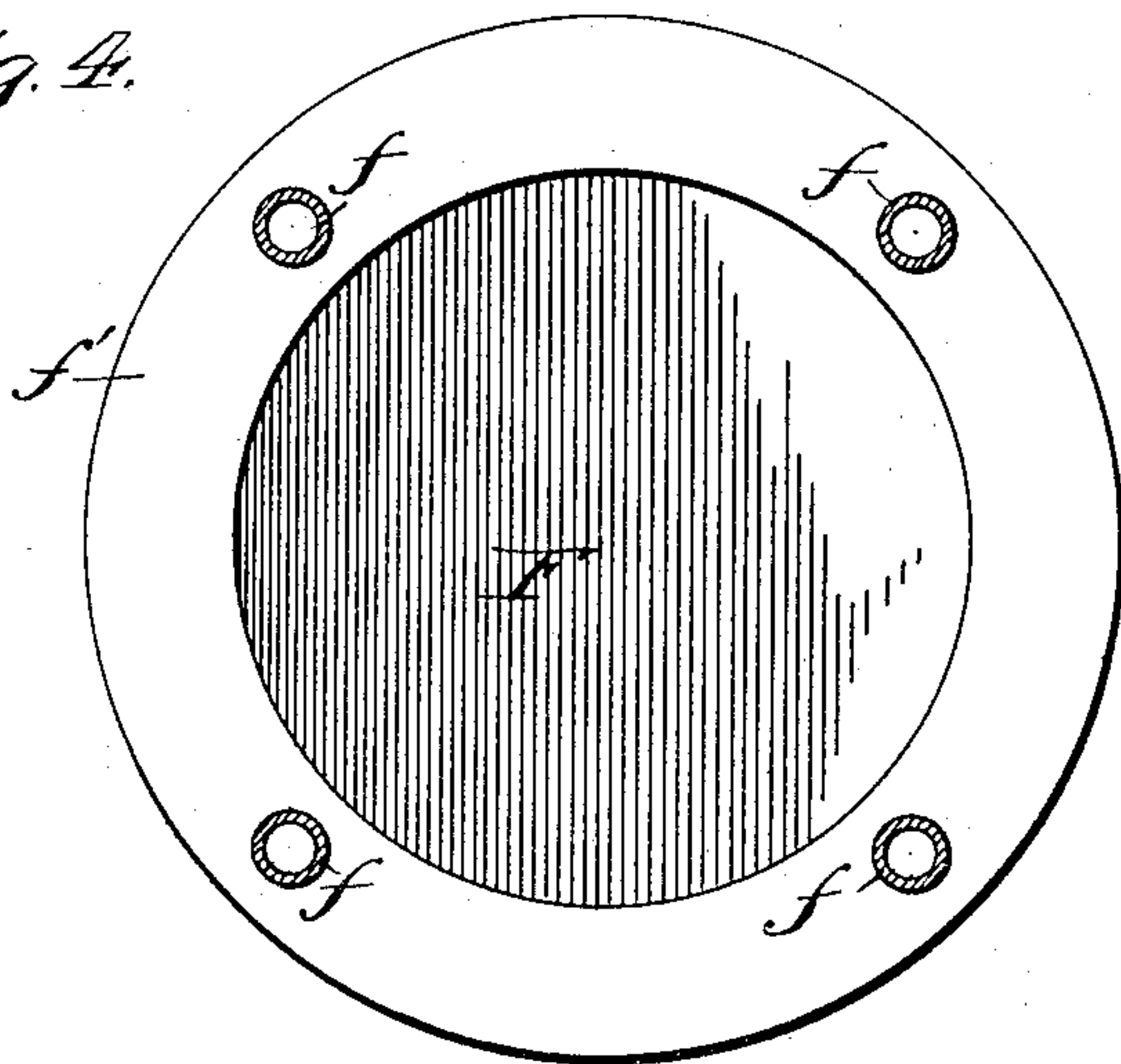


Fig. 4.



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3 SHEETS—SHEET 3.

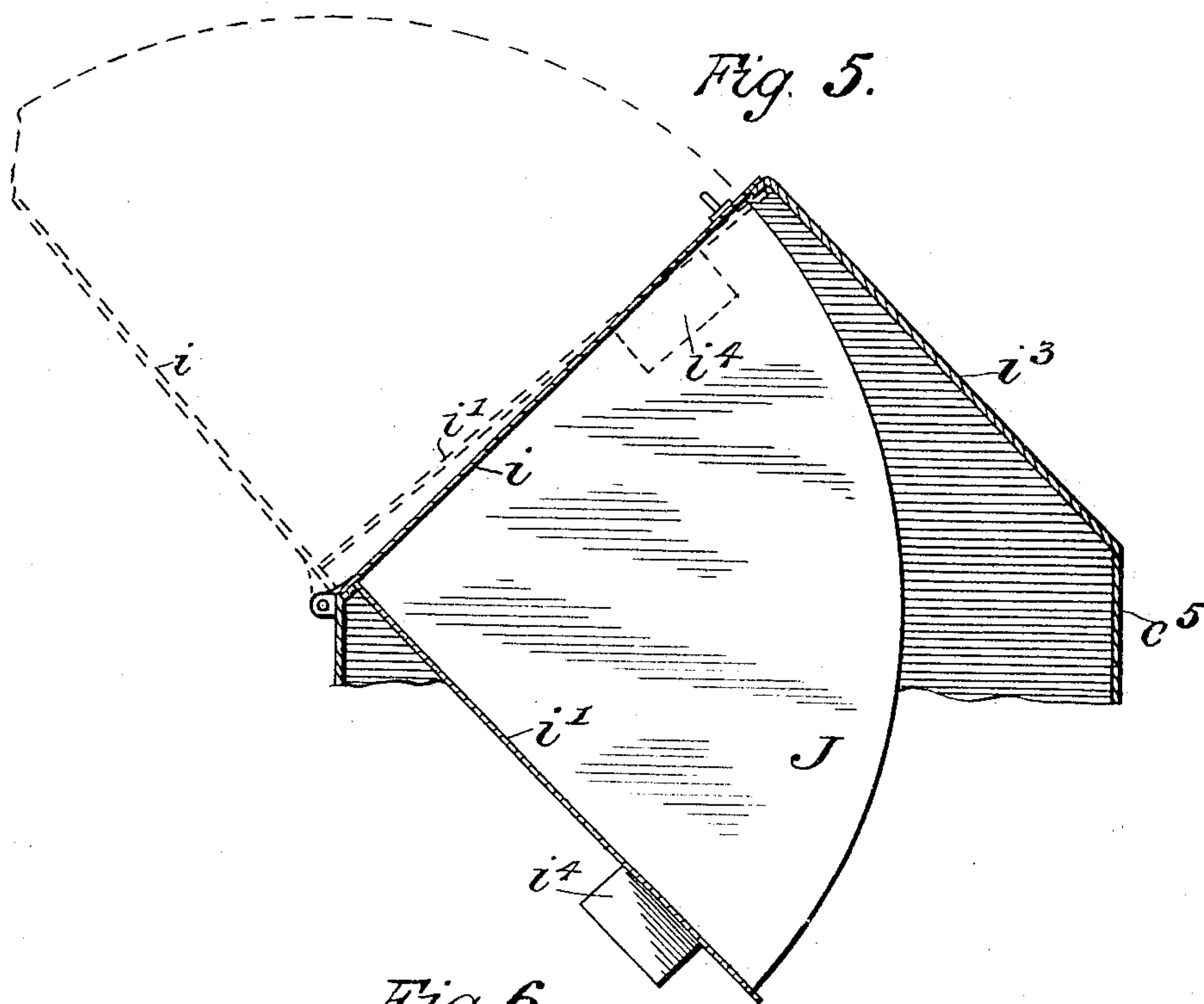
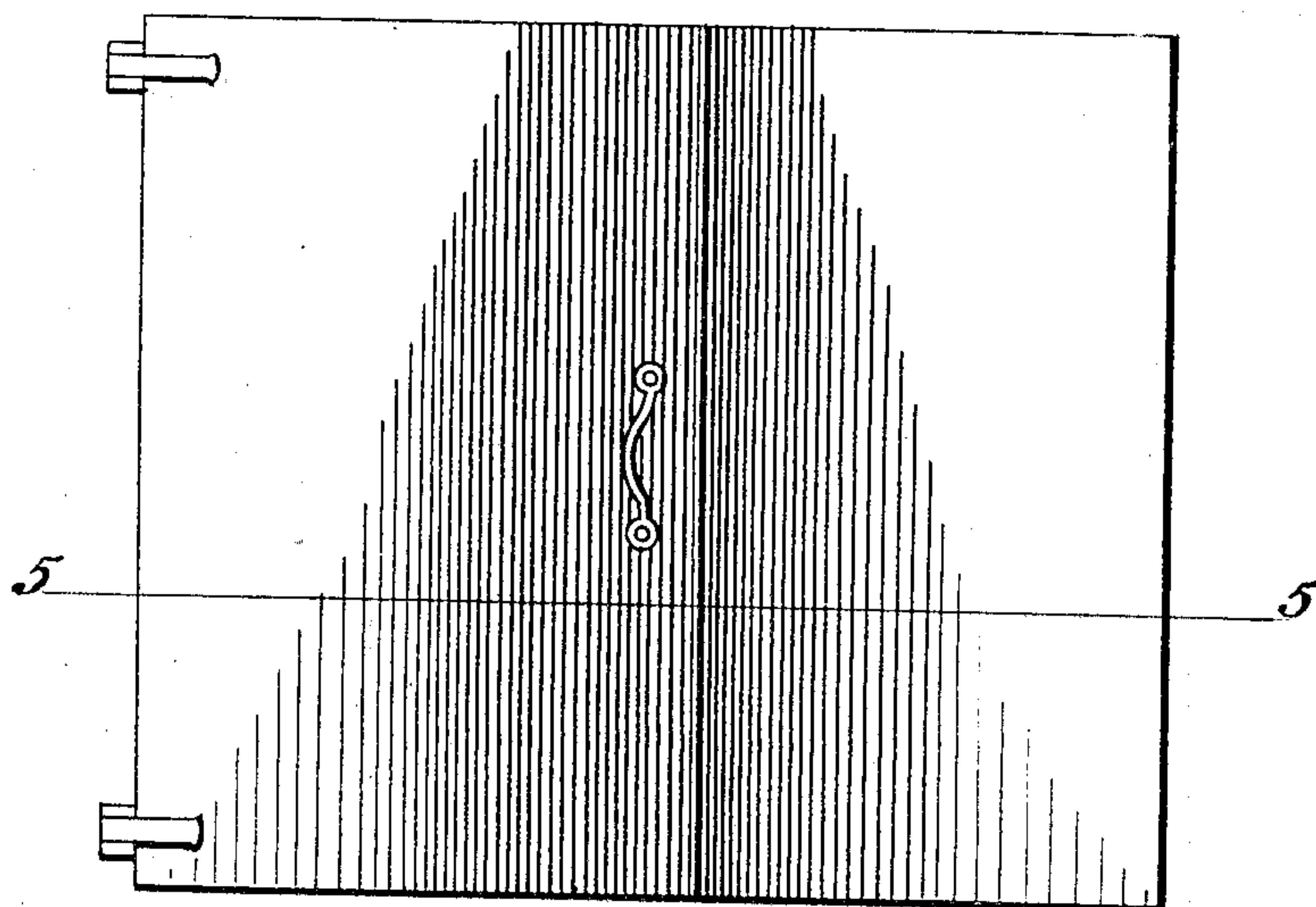


Fig. 6.



Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE W. MATHEWS, OF CHICAGO, ILLINOIS.

HEATER AND GARBAGE-BURNER.

SPECIFICATION forming part of Letters Patent No. 766,153, dated July 26, 1904.

Application filed September 24, 1902. Serial No. 124,627. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. MATHEWS, a citizen of the United States, and a resident of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Heaters and Garbage-Burners; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to an improvement in a combined water-heater and garbage-burner, and more particularly to a construction designed to permit garbage and other refuse to be utilized in providing hot water for residences or the like. Heretofore much expense has been occasioned in municipalities and elsewhere in providing for the removal and destruction of garbage. Frequently, also, delay in removing garbage from premises results in contamination of the atmosphere, producing inconvenience and disease.

The object of this invention is to provide a construction which shall enable garbage to be burned or destroyed on the premises, utilizing the same in part for the purpose of providing a supply of hot water to the premises.

The invention consists in the matters hereinafter described, and more fully pointed out and defined in the appended claims.

In the drawings, Figure 1 is a vertical section, partly broken, of a device embodying my invention. Fig. 2 is an enlarged vertical section of the garbage-grate. Fig. 3 is an enlarged fragmentary vertical section taken at the middle of the heater or burner and showing the water-pan. Fig. 4 is a top plan view of the water-pan, showing the means for supporting the same. Fig. 5 is an enlarged vertical section of a magazine-receptacle for the garbage, illustrating the open position in dotted lines. Fig. 6 is a top plan view of the same, showing the magazine closed.

As shown in said drawings, said burner comprises a vertical boiler consisting of an outer and an inner shell A and A', in which at the top is connected the water-supply pipe B. Said inner and outer shells are of metal of

any desired thickness and are permanently secured by riveting or like means to a mud-ring at the bottom of the shell in the usual manner and at the top to a ring a, as shown in Fig. 1. Over the top of the boiler thus formed and rigidly secured thereto is the annular head C, of sheet metal, beneath which is secured by riveting or the like an annular casting, providing an annular water-chamber c, and the peripheral flange c', to which is secured by riveting or the like the outer jacket of sheet metal D. Intermediate of said peripheral flange c' and the outer shell A of the boiler proper is a similar annular flange c'', extending downwardly from said casting. As shown, said casting is rigidly secured on the head C by riveting or other means to afford a tight joint. A magazine-aperture is provided through the middle of the head, as shown in Fig. 1, about which is provided a peripheral flange c³, at the top of which is hinged the cover c⁴, which may be of any desired type. Within the boiler at a height to afford supports for the grates are secured by riveting or like means angle-bars e, on which are supported a grate E of any desired type, adapted to support fuel used in drying and burning the garbage. Above said fuel-grate E at a convenient distance is supported the garbage-grate E', which, as shown, is constructed of a hollow casting adapted to permit a circulation of water around and through the grate at all times. Said garbage-grate is also circular in form and fits loosely in the boiler, providing a restricted annular passage between the same and the inner shell A'. Said grate comprises an annular rim, which on the under side is beveled downwardly and outwardly, providing a deflector adapted to direct the heat and gases of combustion inwardly through the garbage on the grate. Said rim is hollow and provides a water-chamber in which communicate the tubular grate-bars e', which, as shown, are angular, the upper surfaces thereof inclining downwardly to direct ash or fluids into the water-pan F. Said water-pan, as shown, is circular and hollow, comprises a casting having a depression in the upper surface or top thereof to form an evaporating-pan, and provided

with a raised hollow rim surrounding said pan, through which the water from the boiler circulates, and indicated by f' . Said pan is of less diameter than the garbage-grate, providing a comparatively large annular passage for the draft and gases of combustion between the same and the inner shell. Said water-pan is supported below the garbage-grate by means of tubes f , as shown four in number, which communicate with the interior water-chamber of the pan through the rim f' and with the annular chamber surrounding the garbage-grate. Said garbage-grate and water-pan are supported from the top of the boiler by means of pipes f^2 , a plurality of which communicate with the annular chamber c and at their lower ends communicate with the interior of the annular chamber surrounding the garbage-grate and form the support for said grate and pan. Located adjacent to and above the burner or heater is the hot-water tank G , from the lower side of which the pipe g extends downwardly and communicates with the interior chamber below the water-pan through the pipe g' and with the boiler near the bottom through the pipe g^2 . From the side of the tank projects the tube or pipe G' , from which branches g^3 and g^4 extend into the annular water-chamber c and into the top of the water-space between the shells A A' .

A fire-door (not shown) is provided conveniently above the grate E , and an inspection and clean-out door (indicated by H) is hinged to the outer shell D and opens through the boiler approximately on a level with the top of the water-pan and slightly below the garbage-grate and permits the removal of ashes or the like from the pan and the stirring or agitating of the material upon the grate. An ash-door of convenient form is also located below the grate E to permit removal of ashes from below the fire-box.

A flue d communicates, through the jacket D , with the space between said jacket and the outer shell A of the boiler. A depending sheet or plate of metal D' is rigidly secured on the annular flange c^2 by riveting or like means and extends below the flue d and also below the flues a^2 , which open through the boiler, near the top thereof, and permit the escape of the gases of combustion from the fire-box into the space inclosed by the outer jacket D .

The operation is as follows: Any garbage dumped upon the garbage-grate is quickly dried, the water thereof running downwardly through the grate and into the pan F . The heat from the fire-box, aided by the circulation of hot water through the pan and garbage-grate, serves to evaporate all fluid from the garbage, causing the same to pass outwardly through the flues. The upwardly-flowing current of the heated gases of combustion is deflected inwardly by the downwardly-inclined edge of

the garbage-grate and passes upwardly between the tubular grate-bars, thoroughly heating and drying and eventually consuming the garbage supported thereon. In so doing the garbage is not only consumed, but the water contained in the hollow pan, the garbage-grate, and the tubes and the water contained between the shells A A' is heated, and the convection thereof causes circulation thereof through the system including the water-tank G and the connecting-pipes. The heating effect of the gases of combustion upon the contents of the boiler is further increased by the deflector-shells D' , which extend downwardly below the flues and which direct the gases of combustion downwardly close to the outer shell A of the boiler, thus heating the boiler both in the outer and the inner side at one and the same time. It is obvious, inasmuch as the garbage-grate is of but slightly less diameter than the diameter of the inner shell of the boiler and the under surface thereof is inclined downwardly and outwardly, as shown in Fig. 1, overlapping the periphery of the water-pan to a considerable extent, that the hot gases of combustion rising on each side of the pan are deflected inwardly by said inclined surface of the garbage-grate, and thereby directed through the garbage.

Obviously, if preferred, a garbage-magazine may be substituted for the cover c^4 , and such a construction is illustrated in Figs. 5 and 6, in which the annular flange surrounding the top of the feed-aperture for the garbage is indicated by c^5 , and the opening, as shown, is approximately rectangular and on one side of the same is provided the inclined wall i^3 , forming a tight joint with the sides of the casing surrounding the garbage-aperture. On the other side is hinged the triangular bucket I , the sides i i' of which are of approximately equal lengths and fit closely in said casing and close the opening into the garbage-burner either when said bucket is in filling or in dumping position, so that when it is desired said triangular bucket may be turned outwardly, as shown in dotted lines in Fig. 5, and the garbage placed therein without escape of fumes from the furnace. The receptacle then by its own weight, aided by a counterweight i^4 , secured on the inner side of the side wall, acts to dump the garbage inwardly upon the garbage-grate. Obviously said heater and burner is adaptable for use as a water-heater in the usual manner and affords exceptional advantages for said purpose, being a water-flue boiler of great heating efficiency and may be used continuously for water-heating independently of the consuming of garbage; but inasmuch as it affords a convenient means for disposing of garbage whenever the same may be necessary it serves a double purpose—protecting the health of the user and economizing in supplying hot water.

Obviously many details of construction

may be varied without departing from the principles of this invention.

I claim as my invention—

1. A water-heater comprising an upright
5 water-shell boiler, a grate supported therein,
a plurality of flat, annular water-chambers
supported above the grate, a grate comprising
a plurality of water-tubes extending trans-
10 versely of one of said chambers and communi-
cating therewith, and water-tubes connecting
said chambers and supporting the lower cham-
bers from the upper chambers.

2. A water-heater comprising a boiler, a
15 water-chamber therein concentric with said
boiler, an evaporating-pan in the upper side
of said chamber, an annular water-chamber
in the top of said boiler, pipes connecting said
chambers and supporting the lower one, a
20 fluid-containing tank above said boiler, and a
plurality of pipes communicating with the
boiler and with said water-chambers, respec-
tively at a plurality of points.

3. A heater comprising an inner and an
25 outer shell providing a comparatively thin
annular boiler, a fuel-grate supported on the
inner shell, a lower water-chamber located
above the grate and having a sunk top form-
ing a pan, an annular water-chamber above
said lower chamber, a plurality of parallel
30 water-pipes extending parallel with the an-
nular chamber and opening thereinto forming
a grate above the lower chamber, and water-
tubes connecting said lower chamber and grate
and supporting the same in the boiler.

4. The combination with a water-tube
35 boiler, of a fuel-grate, an annular water-cham-
ber above said grate, a plurality of parallel
pipes intersecting said chamber and forming
an upper grate, the lower surface of said cham-
ber being adapted to deflect the heat through
40 said upper grate, a water-chamber intermedi-
ate said grates and having an annular depres-
sion in the top thereof forming a water-pan,
a plurality of pipes supporting and affording
45 communication with said chamber, and a door
in the top of said boiler to permit materials
to be dumped upon the upper grate.

5. The combination with an annular boiler,
50 of a grate therein, a plurality of water-tubes
supported from the head of the boiler and ex-
tending downwardly therein, a hollow grate
supported thereon of slightly less diameter
than the interior of the boiler, a circular wa-

ter-chamber supported below said hollow grate
of materially less diameter than said grate, 55
and having a circular depression in the top
thereof forming a pan, tubes affording com-
munication with the interior of said hollow
grate and forming a support for said water-
chamber, a water-tank, and upper and lower 60
pipes leading from the tank and connecting
at each end of the boiler and with said water-
tubes.

6. The combination with an annular boiler,
of a fire-grate supported therein, outwardly- 65
opening flues near the top of the boiler, an
outer jacket or shell surrounding the boiler,
a flue connected therewith, a deflector-sheet
supported from the boiler-head and extending
downwardly between the jacket and the outer 70
shell and below the flues, a magazine-opening
in the top of the boiler and water-tubes con-
nected around said opening, a water-cham-
bered grate supported thereon and of a diam-
eter but slightly less than the interior of the 75
boiler, a water-chamber of less diameter than
and supported below said water-chambered
grate, both said water-chamber and the inte-
rior of said grate communicating with and
supported on said water-tubes, a water-tank 80
and upper and lower pipes each connecting
respectively with the water-pipes and with the
boiler.

7. In a water-heater the combination with
an upright water-shell boiler, of a grate there- 85
in, a plurality of water-chambers arranged
parallel with said grate and one above the
other, the upper of which is rigidly secured
in the top of the structure and the lower pro-
vided with a water-pan in the top thereof, an 90
upper grate supported on the chamber next
above the lower chamber comprising a plu-
rality of pipes extending across and opening
into said chamber, a plurality of pipes com-
municating with and supporting said lower 95
chamber from the upper chamber, a water-
tank and pipe affording communication be-
tween the tank and boiler.

In testimony whereof I have hereunto sub- 100
scribed my name in the presence of two sub-
scribing witnesses.

GEORGE W. MATHEWS.

Witnesses:

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ANNA B. HILLS.