

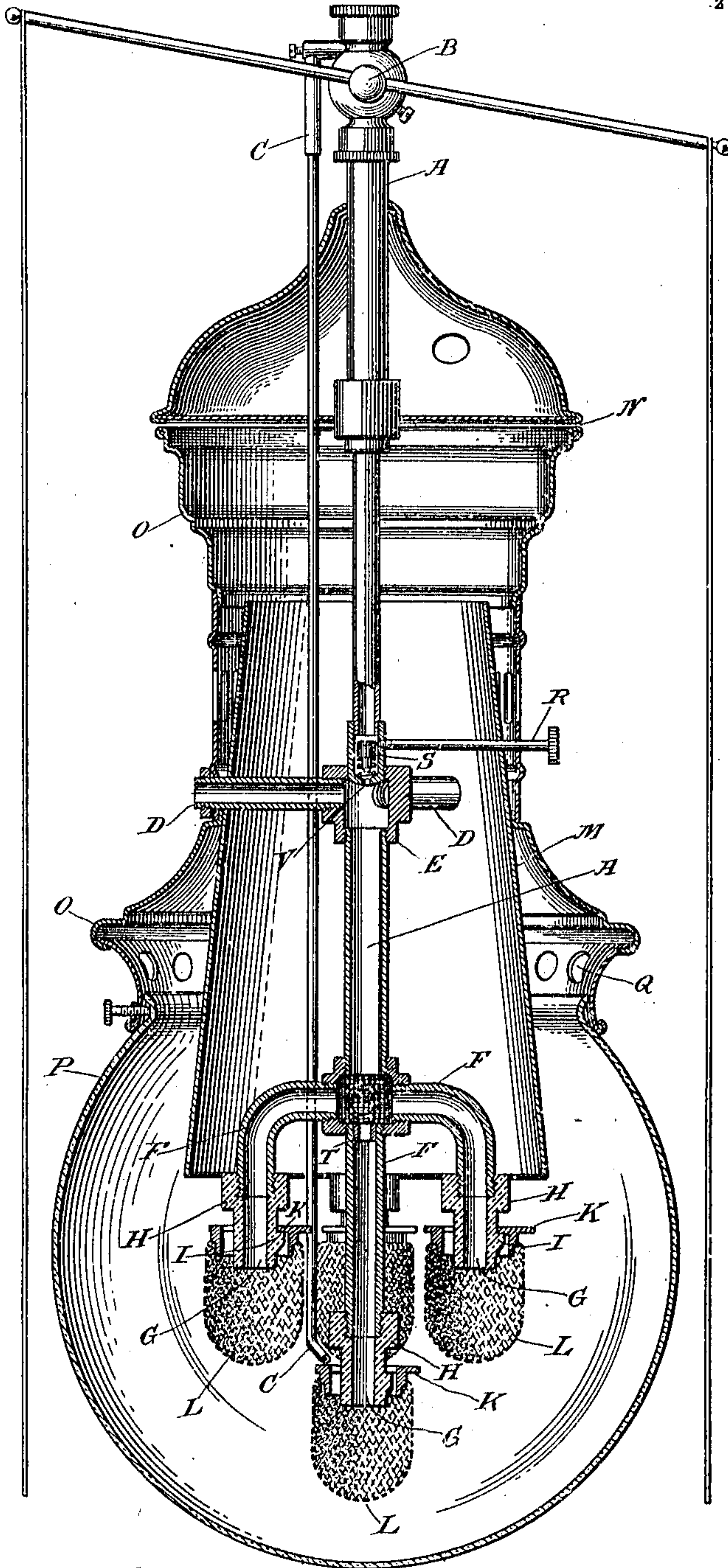
J. LEDERER.
 INVERTED GAS BURNER.
 APPLICATION FILED APR. 5, 1909.

955,973.

Patented Apr. 26, 1910.

2 SHEETS—SHEET 1.

Fig. 1.



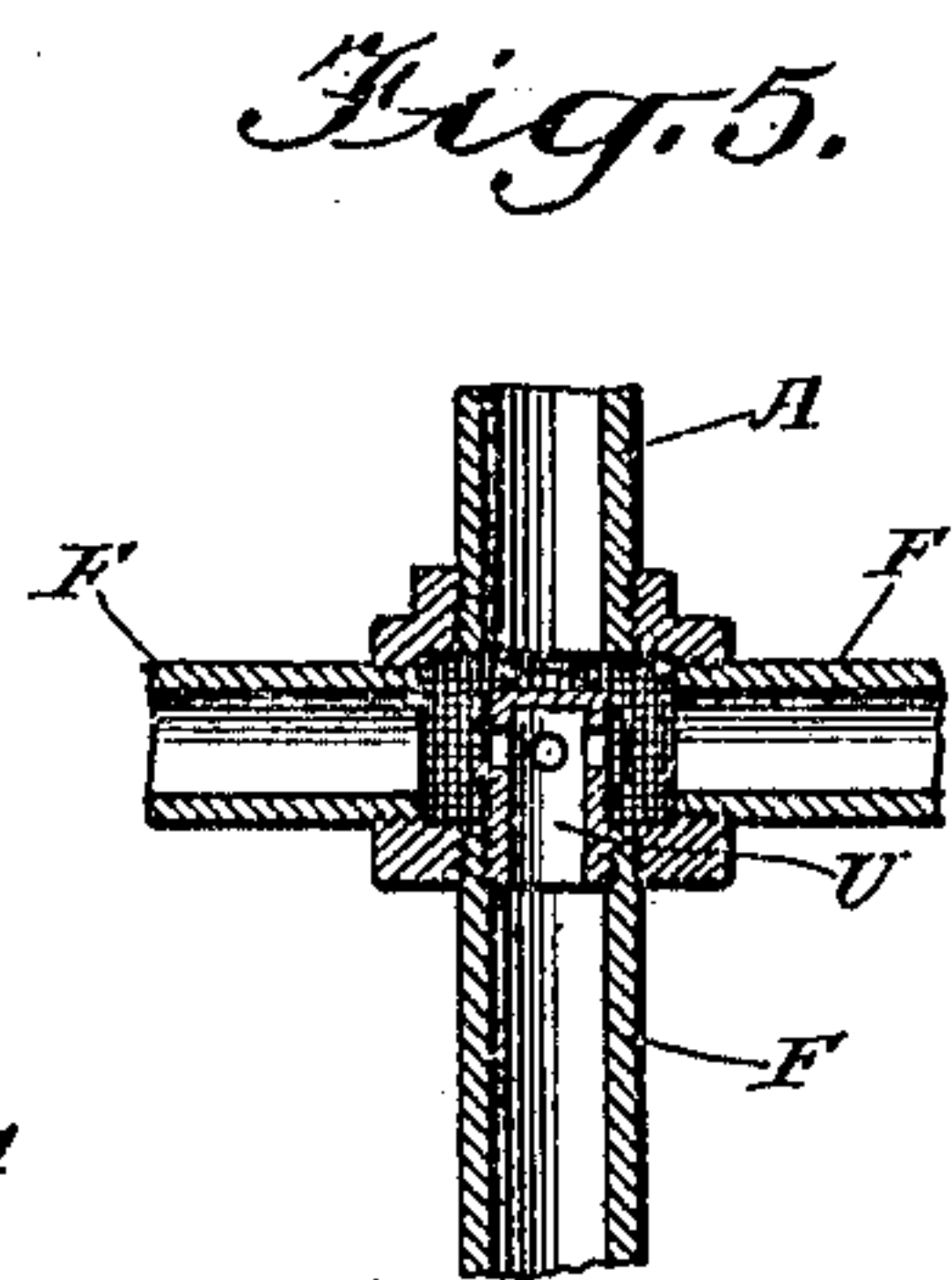
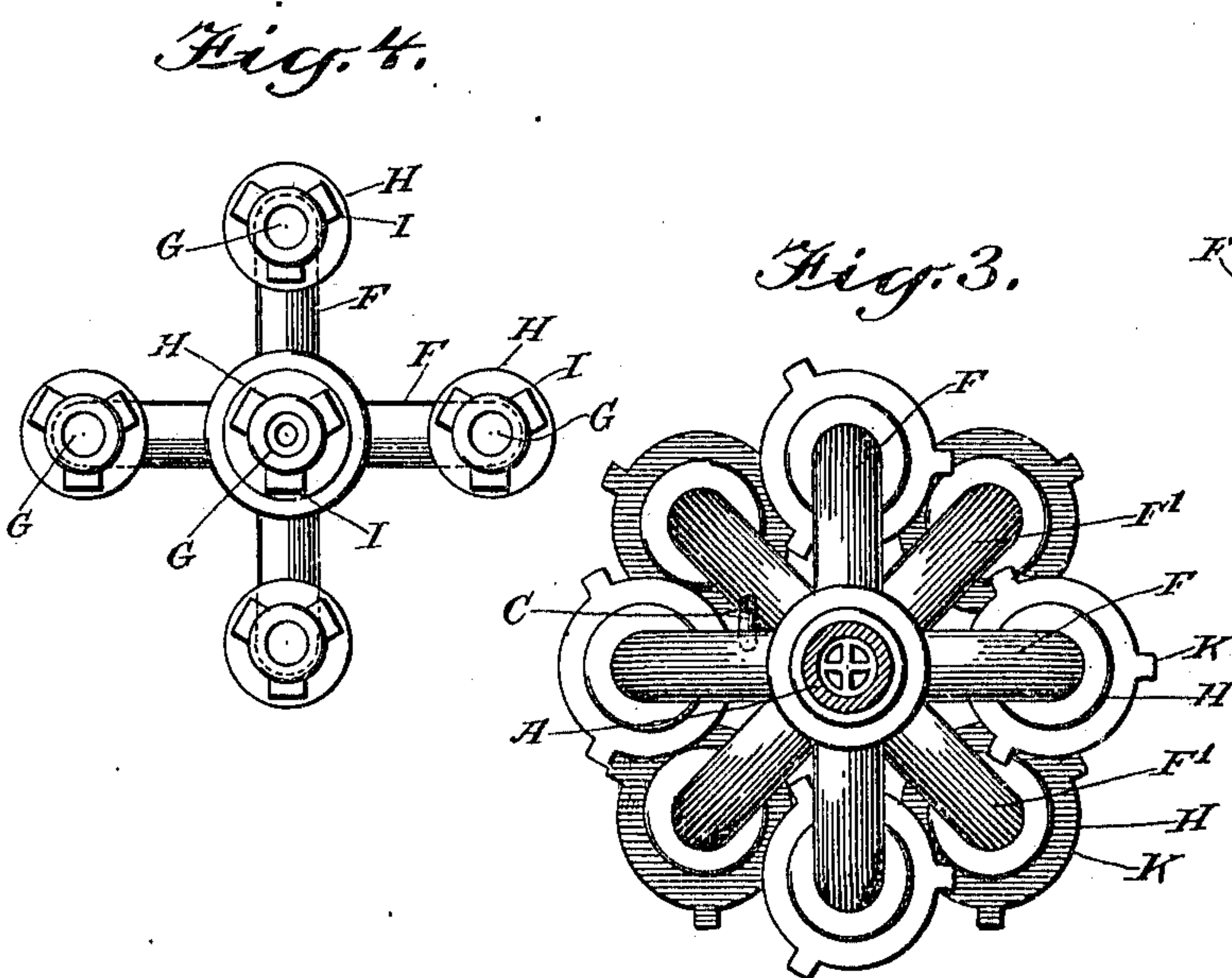
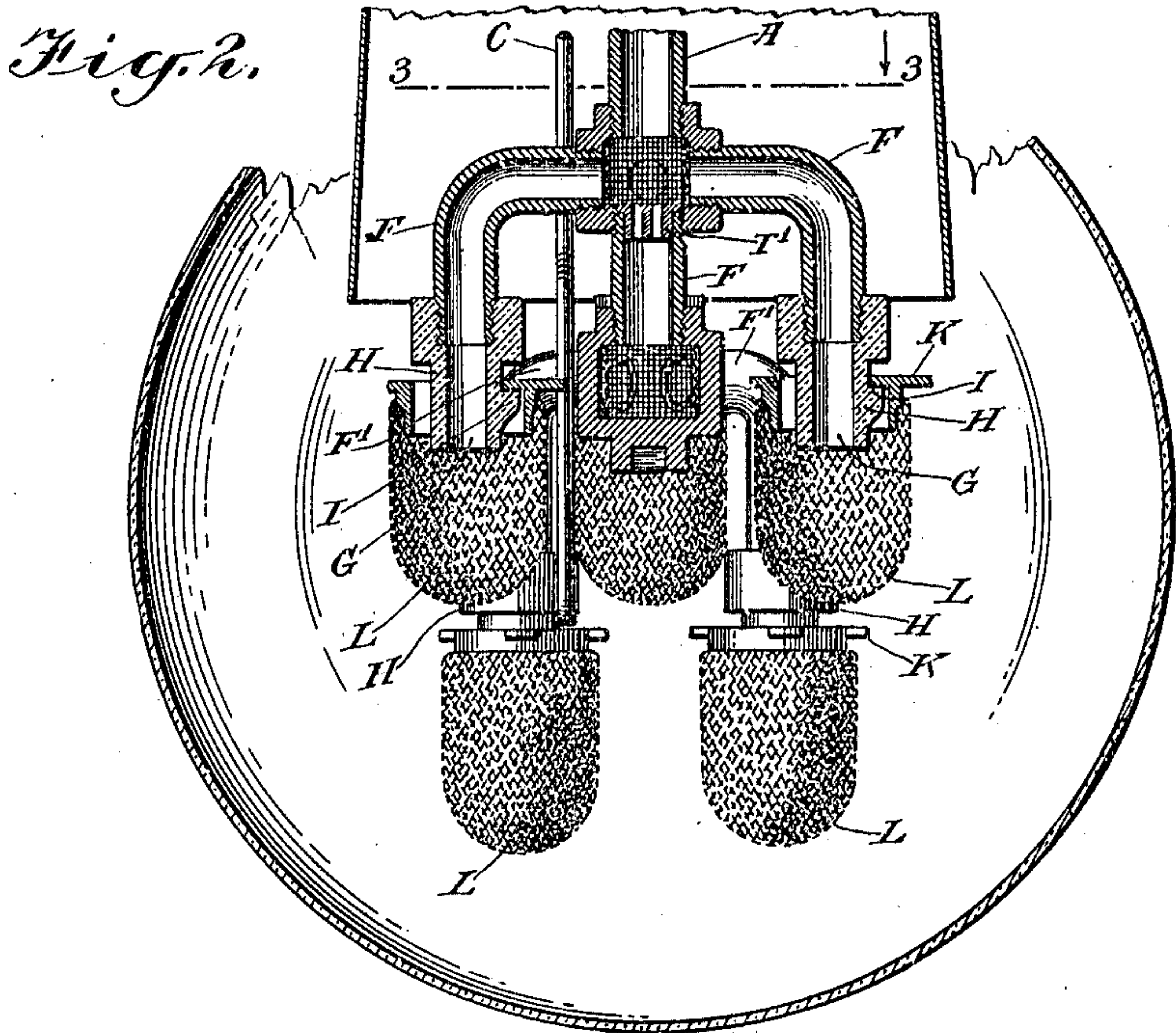
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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INVERTED GAS-BURNER.

955,973.

Specification of Letters Patent.

Patented Apr. 26, 1910.

Application filed April 5, 1909. Serial No. 487,841.

To all whom it may concern:

Be it known that I, JOSEPH LEDERER, a citizen of the United States, residing in the city, county, and State of New York, have
5 invented certain new and useful Improvements in Inverted Gas-Burners, of which the following is a specification.

This invention relates to inverted gas-burners of the Bunsen type and has for its
10 object the production of such an inverted gas-burner provided with a plurality of downwardly opening orifices for the exit and ignition of the gas and air mixture and
formation, upon ignition, of inverted flames
15 adapted to render incandescent mantles for incandescent gas-light, so arranged that one or more mantles extend below other mantles with which the burner is provided, and the
other features and advantages hereinafter
20 described and claimed.

Heretofore in the construction of inverted gas-burners of the Bunsen type for use with
mantles for incandescent gas-light difficulty
has been experienced and, in constructing
25 such burners to supply, in a single lamp, a gas and air mixture to more than one downwardly opening orifice or inverted flame and to heat to incandescence two or
more inverted mantles, separate downwardly
30 extending ducts, one for each mantle and each provided with holes or openings for the admission of air, have generally been employed. The construction of such or similar gas-burners for use with two or more in-
35 verted mantles is complicated, difficult, expensive and unsatisfactory. Furthermore, in the construction heretofore of such or similar gas-burners for use with two or more inverted mantles, the mantles have been so
40 arranged that each inverted mantle was substantially level with each of the other inverted mantles with which the burner was provided, with the result that each mantle intercepted to a very considerable extent the
45 light emitted by the other mantles and the full light giving power of the mantles was not secured.

It is the primary object of this invention
so to arrange the several inverted mantles of
50 a burner that the said interception of light emitted by the several mantles will be obviated to a very considerable extent and the light-giving power of the mantles will be made available to a far greater extent than
55 heretofore. Preferably I employ for this purpose a burner such as that hereinafter

described and illustrated in the drawings forming part of this specification.

Figure 1 is an elevation, mostly in vertical section, of an inverted gas-burner embody- 60
ing this invention. Fig. 2 is an elevation, mostly in vertical section, of the lower part of a modified form of an inverted gas-burner embodying this invention. Fig. 3 is a plan
view from above of a horizontal section 65
along the line 3—3 of the downwardly extending duct A shown in Fig. 2, and of those parts of the burner which are suspended
from duct A. Fig. 4 is a plan view from
below of the several arms, shown in Fig. 1, 70
extending from the lower end of the downward duct A, the mantles having been removed from the lower ends thereof. Fig. 5
is a vertical section showing a modification
of the means for communication shown in 75
Figs. 1 and 2 between the lower end of duct A and the upper end of the central arm extending downwardly therefrom.

In the drawings like letters denote like parts. 80

A is a downwardly extending duct or tube which may consist of one part but which is, preferably, made of several parts, as shown in the drawings.

B is a stop-cock for turning the gas on 85
and off.

C is a duct for a pilot-light leading from duct A above the stop cock B.

DD are air-supply ducts extending, preferably, horizontally and from a part E with 90
which the duct A is provided. The ducts DD, as shown, supply air to the downward duct A, preferably at a point above the point or points at which the plurality of arms FF extend from the lower part of duct A. 95
With the exception of such a central arm F as that shown in Fig. 2 and hereinafter described, the arms FF and F'F' are provided with downwardly opening orifices GG for the exit and ignition of the gas and air mix- 100
ture and formation, upon ignition, of inverted flames, and the orifices GG are, preferably, provided with mouth-pieces HH made of suitable, refractory material, such as porcelain or clay, having projecting 105
points or ledges II adapted to receive and carry rings KK or other suitable means for attachment of the upper ends of the inverted mantles LL.

As shown in Fig. 1 the lower part or end 110
of the downwardly extending duct A may be provided with a plurality of arms FF,

one of which may, preferably, be located centrally with respect to the others and may extend farther down than the others, so that the inverted mantle attached to the end thereof will be lower than the mantle attached to the end of any one of the other arms FF. As shown in Fig. 2, the lower part or end of the downwardly extending duct A may be similarly provided with a plurality of arms FF extending therefrom, one of which may be located centrally with respect to the others; but in the modification shown in Fig. 2, the lower part or end of the central arm F may, instead of being provided with an orifice G and mouth-piece H, be similarly provided with a plurality of arms F'F' extending therefrom to a point or points below the point or points to which the other arms FF extend downwardly, so that the mantles attached to the lower ends of the arms F'F' will be below the mantles attached to the lower ends of the other arms FF.

As shown in the drawings, the arms FF, excepting such as those centrally located, and the arms F'F' extend, preferably, horizontally and vertically, being bent at an angle.

M is a hollow piece of suitable material such as sheet metal, preferably in the shape of the frustum of a cone, forming a conveyer of the products of combustion, surrounding the duct A and supported by ducts DD which pass through it. The conveyer M extends upwardly from a line preferably just above the uppermost of the inverted mantles LL. The products of combustion resulting from the inverted flames rise and pass off through the conveyer or hollow piece M and some suitable exit, such as N, with which the conveyer or an extension thereof is provided at the upper part of the inverted gas-burner. Inasmuch as the conveyer M does not extend down so as to surround the inverted mantles LL, it does not interfere with the supply of air to the mantles from the outside of the mantles.

As shown in Fig. 1, the upper part of the burner may be provided with a suitable casing O adapted at its lower end to support a globe P, which globe may, as shown, be closed at the bottom. The casing O or globe P, with which it is provided, has holes Q through which air is drawn and supplied to the outside of the mantles, the products of combustion rising and passing off above through the conveyer.

R is a gas-supply regulator shown as consisting of an accessible head on the outside of the burner and a rod passing, preferably, horizontally through perforations of the casing O, conveyer M and duct A. The perforation of duct A may be provided with screw-threads and so may the inner end of the rod and by reason of the screw-threads,

when the rod is turned, the inner end of the rod, which tapers to a point, is made to advance into or to withdraw partially from the channel of duct A. The channel of duct A is provided with a gas-check S at the place where the rod of the gas-supply regulator R enters. The gas-check S may, as will be well understood, be of any suitable construction so that, upon turning the gas-supply regulator R so as to cause the tapered end of its rod to advance into the channel of duct A, the supply of gas to the burner through duct A will be regulated and diminished, and, on turning the gas-supply regulator R in the opposite direction, the supply of gas to the burner through the duct A will be regulated and increased.

Experience in the use of an inverted gas-burner made in accordance with this invention shows that means should be provided in order to obtain an equal and proper distribution of the gas and air mixture supplied by the downwardly extending duct A to the several arms FF, especially to arms F centrally located. As shown in Fig. 1, a plug T with a narrow bore may be inserted in the upper end of the channel of the centrally located arm F so that only a sufficient supply of gas and air will pass into and through the channel of said arm and a sufficient supply of gas and air will be diverted to the channels of the other arms. As shown in Fig. 2 a similar plug T', provided with two or more narrow bores, may for a like purpose, be inserted in the upper end of the channel of the centrally located arm F there shown. In Fig. 5 the upper end of a vertically extending arm F is shown with a hollow cap U, closed at the top and provided with perforations in its sides, inserted in the channel of said arm for a like purpose.

The operation of an inverted gas-burner made in accordance with this invention is as follows;—On turning the stop-cock B gas enters the downwardly extending duct A and passes to the gas-check S where the supply of gas is regulated as described. Upon passing through the contracted part V of the channel of duct A the gas mixes with pure air drawn from the outside of the burner through the air-ducts DD. The gas and air mixture then descends through duct A until it reaches the lower part thereof, where it is supplied to the plurality of arms FF, extending therefrom, and issues from the downwardly opening orifices GG of the arms FF and F'F', where it is ignited and forms inverted flames, which heat to incandescence the inverted mantles LL. The products of combustion rise and escape through the conveyer M and pass off through an opening, such as N, in the burner above the air-ducts DD. Since the products of combustion pass off above the air-ducts DD

and since the air-ducts DD extend from the channel of duct A to the outside of the casing O of the burner, the supply of air through the ducts DD is a supply of pure air, not exhausted of its oxygen as are the products of combustion, and a proper gas and air mixture is thus obtained for the formation of efficient, inverted Bunsen flames. For like reasons, as will be well understood, the supply of air to the outside of the mantles through openings such as Q, is a similarly pure supply of air.

In an inverted gas-burner constructed as above described the supply of gas can be regulated conveniently, because the gas-supply regulator R extends to the outside of the casing O and is located below the point at which the products of combustion escape from the burner, so that it is accessible for manipulation and does not become highly heated. A proper supply of pure air to the burner is obtained through the air-ducts DD which supply air to the downwardly extending duct A and a plurality of efficient inverted Bunsen flames is obtained at the orifices of the plurality of arms extending from a lower part of the downwardly extending duct A. By this simple arrangement of parts, there is obtained, in a single gas burner, a plurality of efficient, inverted Bunsen flames adapted to heat to incandescence a plurality of inverted mantles without the complicated construction, expense or disadvantages heretofore experienced in the construction of burners to produce in a single gas-lamp a number of inverted flames.

As shown in Figs. 1 and 2 the gas and air mixture is distributed from the lower part or end of duct A to the arms FF extending therefrom, suitable means being provided to secure an equal or proper distribution of the mixture to the several arms FF, especially to such arms F as are centrally located and extend vertically directly below the lower end of duct A. In the arrangement shown in Fig. 1 the gas and air mixture supplied to the centrally located arm F, which extends farther down than the other arms F, issues from the orifice G thereof and forms, upon ignition, an inverted flame suitable to render incandescent a mantle for incandescent gas-light; while in an arrangement such, for example, as that shown in Fig. 2, the gas and air mixture supplied in proper quantity to the centrally located arm F is distributed in proper proportions to the channels of arms F'F', which extend therefrom and reach farther down than the other arms FF and issues from like orifices GG of the arms F'F' and, upon ignition, forms inverted flames suitable to render incandescent mantles for incandescent gas-light.

The light emitted by the mantles LL carried by the lower ends of the arms F'F' of

Fig. 2 or by the mantle L carried by the lower end of the centrally located arm F of Fig. 1 will not be intercepted to any considerable extent by the mantles or other parts of the burner above, nor will the light emitted by the mantles above be intercepted by the mantles below to the same extent as it would be if all the mantles were on substantially the same level, and by such arrangement of the mantles in an inverted burner made in accordance with this invention, whereby one or more mantles extend below other mantles with which the burner is provided, the light-giving power of the mantles is made available to a far greater extent than heretofore.

As shown in Figs. 1 and 2 the duct C for the pilot-light should, preferably, extend to one of the lower mantles in order to insure, when the gas is turned on by stop-cock B, the ignition of the gas and air mixture at such lower mantle, and thereby the certain ignition of the gas and air mixture supplied to the other mantles.

What I claim is;—

1. In a gas-burner for use with mantles for incandescent gas-light, the combination of a single downwardly extending duct for gas and air and a plurality of arms for gas and air extending from a lower part thereof provided with inverted mantles extending to different planes, substantially as described.

2. In a gas-burner for use with mantles for incandescent gas-light, the combination of a plurality of arms for gas and air extending downwardly to different planes from a single duct for gas, substantially as described.

3. In a gas-burner for use with mantles for incandescent gas-light, the combination of a single downwardly extending duct for gas and air and a plurality of arms for gas and air extending from a lower part thereof provided with inverted mantles one of which arms extends farther down than any of the other arms, substantially as described.

4. In a gas-burner for use with mantles for incandescent gas-light, the combination of a single downwardly extending duct for gas and air and a plurality of arms for gas and air extending from a lower part thereof provided with inverted mantles one of which arms is centrally located with respect to the other arms and extends farther down than any of the other arms, substantially as described.

5. In a gas-burner for use with mantles for incandescent gas-light, the combination of a plurality of arms for gas and air extending downwardly from a single duct for gas one of which arms extends farther down than any other arm, substantially as described.

6. In a gas-burner for use with mantles

for incandescent gas-light, the combination of a plurality of arms for gas and air extending downwardly from a single duct for gas, one of which arms is centrally located
5 with respect to the other arms, substantially as described.

7. In a gas-burner for use with mantles for incandescent gas-light, the combination of a plurality of arms for gas and air extending downwardly from a single duct for
10 gas one of which arms is centrally located with respect to the other arms and extends farther down than any other arm, substantially as described.

15 8. In a gas-burner for use with mantles for incandescent gas-light, the combination of a single downwardly extending duct for gas and air, a plurality of arms for gas and air extending downwardly from a lower

part thereof to different planes and means 20 for distributing the gas and air in suitable proportions to the different arms for gas and air, substantially as described.

9. In a gas-burner for use with mantles for incandescent gas-light, the combination 25 of a single downwardly extending duct for gas and air, a plurality of arms for gas and air extending downwardly from a lower part thereof to different planes, a duct for a pilot-light extending to a lower mantle,
30 and means for distributing the gas and air in suitable proportions to the different arms for gas and air, substantially as described.

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