

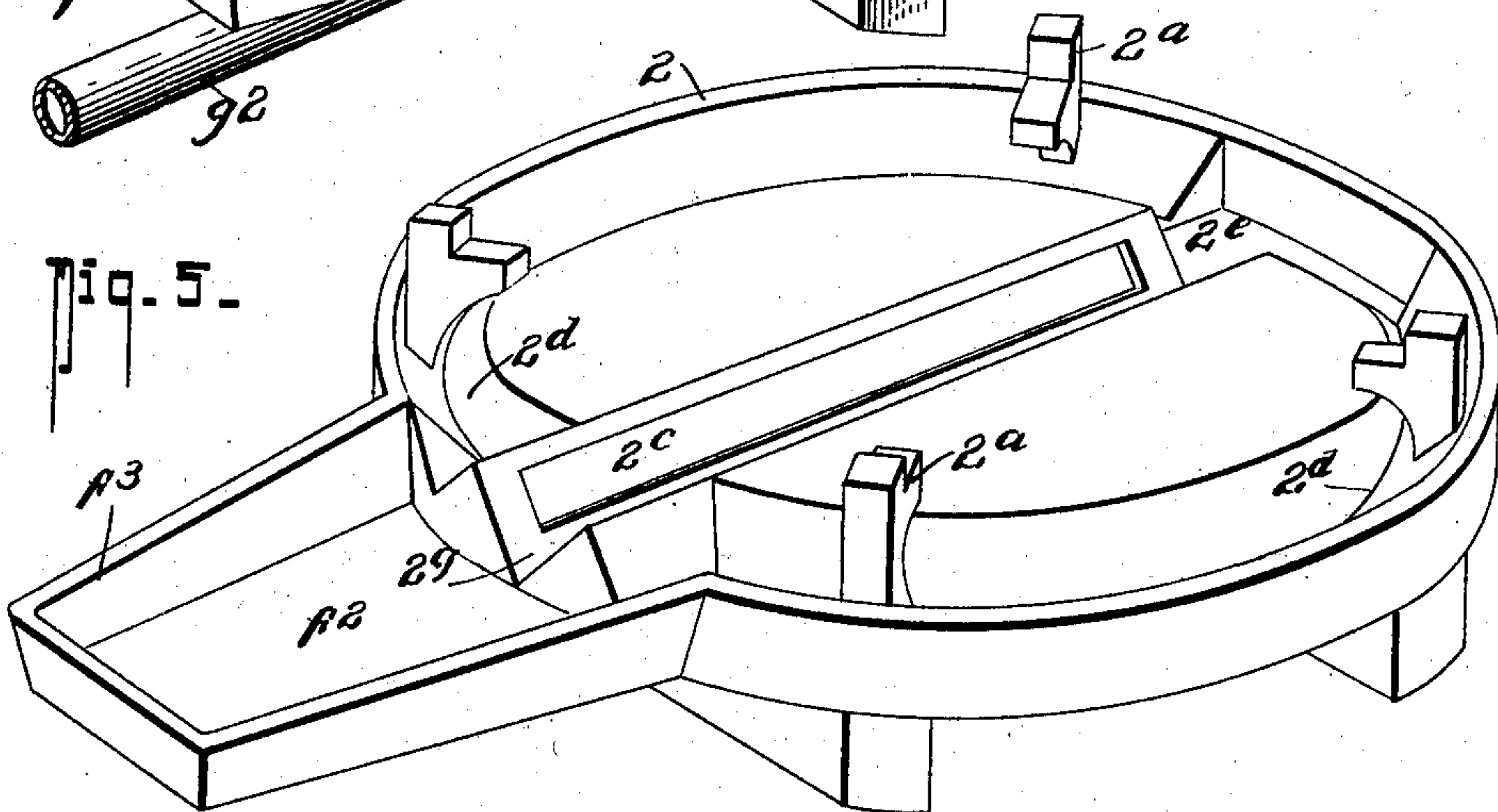
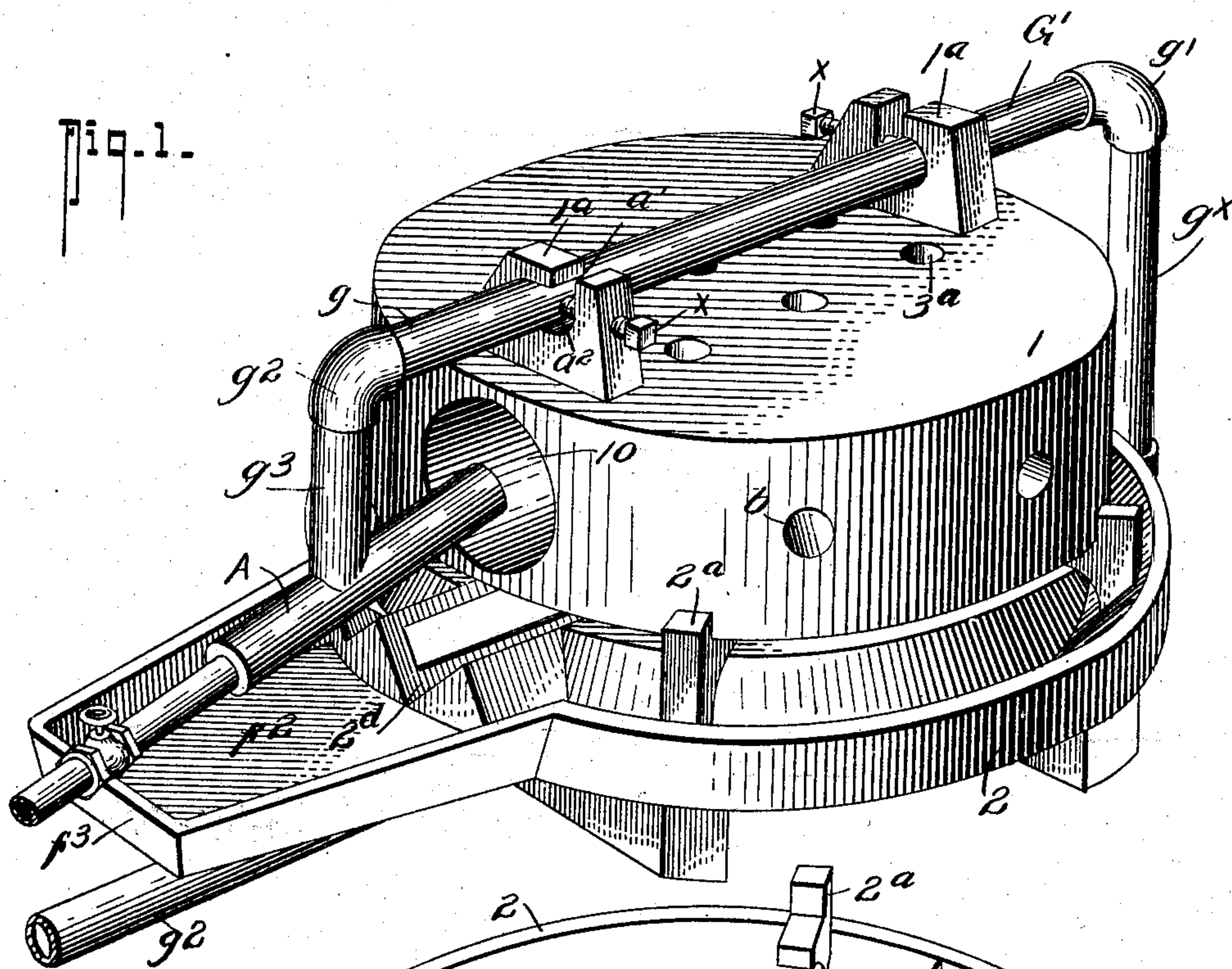
**No. 757,395.**

PATENTED APR. 12, 1904.

O. FALKENWALDE.  
GASEOUS FUEL BURNER.  
APPLICATION FILED JULY 17, 1903.

NO MODEL.

2 SHEETS--SHEET 1.



WITNESSES:

*F. C. Gibson.*

John T. Schrott

*Oscar* <sup>INVENTOR</sup> *Falkenwalde.*

BY  
*Fred G. Dietrich*  
ATTORNEYS.

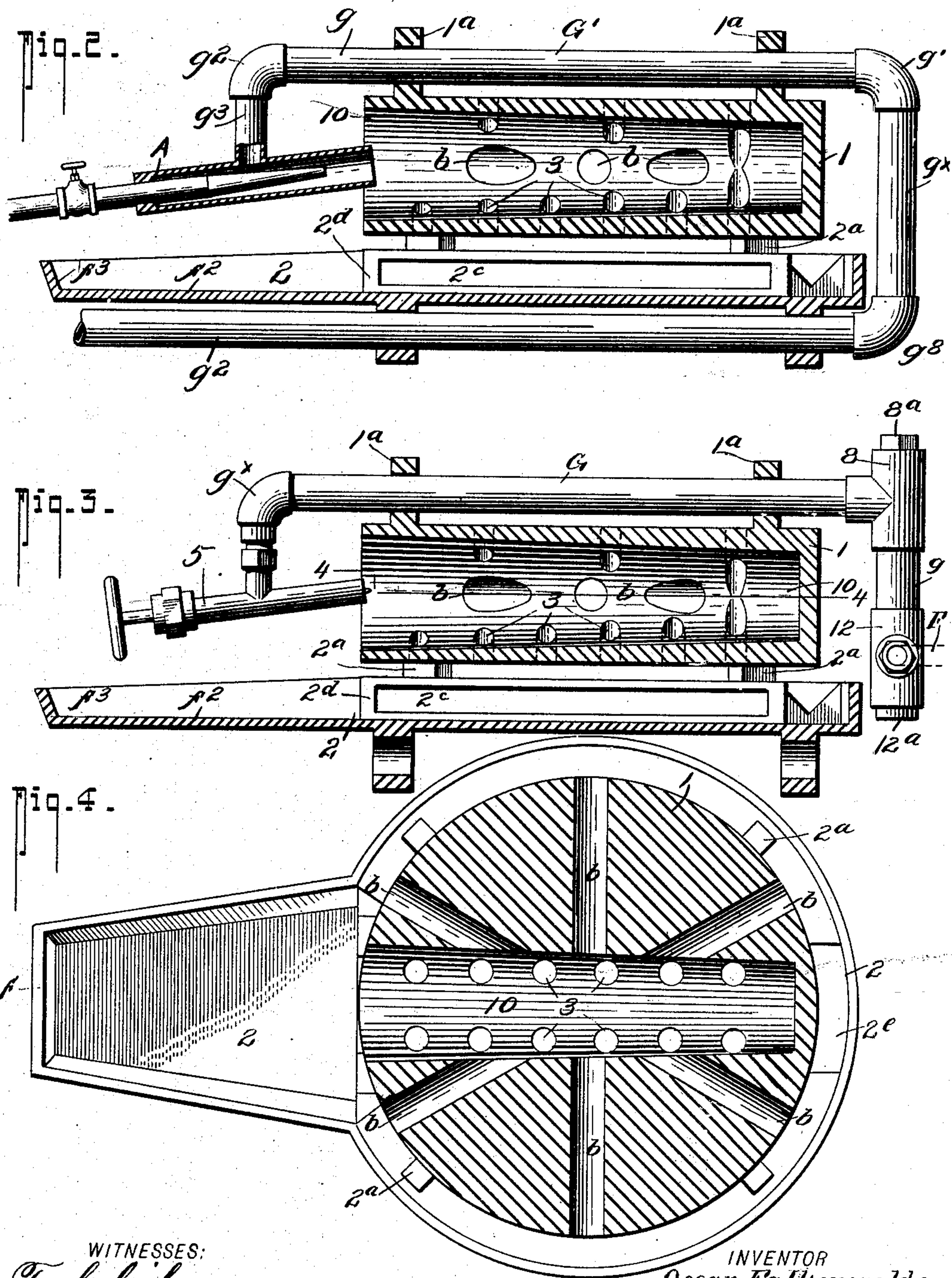
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# UNITED STATES PATENT OFFICE.

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## GASEOUS-FUEL BURNER.

SPECIFICATION forming part of Letters Patent No. 757,395, dated April 12, 1904.

Application filed July 17, 1903. Serial No. 165,968. (No model.)

*To all whom it may concern:*

Be it known that I, OSCAR FALKENWALDE, residing at Baltimore city, in the State of Maryland, have invented certain new and useful Improvements in Gaseous-Fuel Burners, of which the following is a specification.

My present invention seeks to provide certain improvements in that type of gaseous-fuel burners disclosed in my copending application allowed April 21, 1903, Serial No. 153,628, and it primarily seeks to provide for readily adapting the form of burner shown in my application referred to for burning crude oils in a manner to obtain a maximum heat from a minimum amount of fuel by a constant mixture of fuel vapor and superheated steam and water, and also to prevent carbonization of the fuel within the burner.

In its more complete nature my present invention embodies means for feeding crude oil to the mixing-valve and superheating steam by passing the same through the hot zone of the burner and injecting the same in its dry condition into the mixing-valve, whereby to force the crude oil under pressure through the injector-valve in an uninterrupted flow and without danger of its depositing within the valve or burner; and in its still more subordinate features this invention consists in certain details of construction and peculiar arrangement of parts, especially with relation to the burner-body and its support, whereby a simple and effective means is provided for interchangeably attaching a generating means in the hot zone of the burner utilized for vaporizing the refined oils to adapt the burner for use as an ordinary domestic or cold-oil burner and whereby the said refined-oil generator can be conveniently detached and replaced by a similarly-constructed generator designed as steam superheater for coöperating with any well-known type of mixing-valve to which crude oil can be fed in a cold state, all of which will be hereinafter fully explained, and specifically pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of my improved gaseous-fuel burner, the same being arranged for burning crude oil. Fig. 2 is a longitudinal section thereof. Fig. 3 is a similar view showing the same arranged as kerosene-oil burner. Fig. 4 is a horizontal section thereof on the line 4 4 of Fig. 3. Fig. 5 is a perspective view of the bottom casting hereinafter referred to.

In my present construction the burner comprises a horizontally-disposed body, preferably of circular shape, adapted to detachably seat upon the base-casting 2, presently again referred to, and the said body 1 has a longitudinally-extending conical bore or flue 10, which tapers from the entrant to the exit end of the body, as clearly shown in Figs. 2 and 4.

$b\ b$  designate a series of transverse flues, disposed radially with respect to the center of the body 1 and which bisect the conical bore 10, and 3 designates a series of air-inlets, which extend through the bottom of the body and communicate with the central bore 1 at a point where the flues  $b\ b$  join therewith.

3<sup>a</sup> designates a series of combined oil mixing and burner flues that open through the top of the body 1 into the bore 10 at the point between the radial flues  $b$  and the several flues  $b$  and 3<sup>a</sup> and the inlets 3, coöperated with the bore 10, to provide for a thorough mixing of the oil and gas and for discharging the flame in radial and vertical directions.

At the front and rear ends the top of the burner-body 1 is cast with vertical extensions or bridge-pieces 1<sup>a</sup>, each of which is provided with a seat produced by a slot  $a'$ , that connects with the lateral recess  $a^2$ , and the recess  $a^2$  in one of the bridge-pieces is extended in the opposite direction to that of the recess  $a^2$  of the opposite bridge-piece, whereby when the generating-chamber G is fitted in place the same can be firmly locked from pulling up out of the end seats, and to securely hold the said member G from lateral motion in the recesses  $a^2$  clamp-bolts  $x$  are fitted through the bridge-pieces to engage the said member G in a manner clearly shown in the drawings.



By providing the bridge-pieces 1<sup>a</sup> with seats, as shown, it is obvious the generator G can be conveniently mounted on the burner-body or removed therefrom, such means of attaching the generator being especially designed to permit of interchangeably attaching a second generator G'.

The generator G includes an elbow  $g^x$ , to which is connected an ejector or needle valve 5, which when the generator G is used discharges into the entrant end of the bore 10, and the said generator G also includes a T-coupling 8, provided with a detachable screw-plug 8<sup>a</sup> in the top and a screw-tap at the bottom to receive a pipe-section 9, with which joins a union-coupling 12, having a threaded bore to receive the oil-feed pipe F and the screw-plug 12<sup>a</sup> in the bottom, as shown.

In practice the members G, 9, 12, and 8 are filled with a suitable fluid-absorbing packing to screen the fluid and effect a thorough distribution thereof.

The parts so far described when coöperatively joined provide for burning kerosene-oil, which is vaporized as it passes through the generator G by reason of the members 8, 9, and 12 being disposed in the heat zone at the rear end of the burner-body and the member G within the heat zone at the top of the burner, the flames through the openings 3<sup>a</sup> in the said burner discharging up out each side and over said member G when the burner is in operation.

The bottom casting 2 in my construction is substantially the same as is shown in my other application referred to, except that it is of a circular shape to conform to the shape of the burner-body 1 and which includes lugs 2<sup>a</sup> 2<sup>a</sup>, that project inwardly to form rests to support the body 1 and are located sufficiently above the base of the casting  $\alpha$  to provide for the free circulation of air under the burner 1 for feeding into the air-inlets 3, and the lugs 2<sup>a</sup> are also elevated sufficiently so as not to close off the concentrically-disposed channels 2<sup>d</sup>, that communicate at the rear end with the collecting-pocket 2<sup>e</sup>, formed in the base, and at the front end with a similar pocket  $f^2$ , formed in the forwardly-extending portion  $f^3$ , located under the ejector-valve 5. The bottom casting 2 in my present construction also has a central longitudinal V-shaped channel 2<sup>e</sup>, that connects with the two end pockets 2<sup>a</sup> and  $f^2$  and whose side walls have air-openings 2<sup>e</sup> 2<sup>e</sup>, as shown.

For burning crude or asphaltum oils I provide a second generator G', adapted to be detachably fitted in the bridge-seats on the top of the burner in place of the generator G, and the said generator G' comprises a pipe-section  $g$ , having a union-coupling  $g'$  at one end with which connects a pendent member  $g^x$ , that extends down in the heat zone at the rear end of

the burner-body and is joined with a union-coupling  $g'$ , with which the steam-feed pipe  $g^2$  is coupled when the generator G' is to be used. The pipe  $g$  at the front end connects with the elbow  $g^2$ , having a pipe-section  $g^3$ , which connects with the mixing-valve A of any well-known type provided with an air or steam inlet and an oil-inlet.

From the foregoing description, taken in connection with the accompanying drawings, it is manifest that by reason of the peculiar construction of the burner-body and the means for sustaining the oil and the steam vaporizers G and G' my generator can be conveniently utilized as an ordinary kerosene-oil burner or for burning crude oils for furnaces, boilers, &c., where intense forced heat is required, without changing any of the parts of the burner-body and its supporting-base. All that is required to change from one use to another is to interchange the burners G and G'.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. An improved oil-burner of the character described; comprising a body having a central longitudinal bore, a series of transversely-disposed apertures bisecting said bore, a series of inlets in the top and bottom that communicate with the central bore, said body having bridge portions on the top at each end, each bridge portion having an L-shaped slot in communication therewith, and a generator comprising a pipe-section adapted to be slipped down into the vertical portions of the L-shaped slots in the bridge portions and to be drawn into the horizontal portion thereof, means for clamping said pipe into said recesses, a pendent pipe-section secured to one end of the horizontal pipe-section and projected down in the heat zone at the rear end of the burner-body and an ejector pendently supported from the other end of the horizontal pipe-section to discharge into the front end of the central bore in the burner-body, as described.

2. A gaseous-fuel burner comprising a circular-shaped body having a central bore, apertures that communicate with and radiate from the said bore and extend through the sides of the body, inlets in the top and bottom that communicate with the central bore, said body having bridge members at the top at each end, a generator comprising a horizontal pipe, a pendent portion connected to one end thereof adapted to join with the feed-pipe to be held in the heat zone at the rear end of the burner-body, a pendent member on the other end of the said pipe, a valve connected therewith adapted to discharge into the central end of the central bore in the body 1, means for detachably mounting the horizontal pipe-section in the bridge-pieces, burner-inlets in the top of the burner-body, and a detachable base



having recesses for supporting the burner-  
body, said base having air-inlets, a collecting-  
pocket at each end, a longitudinal channel-  
way having air-inlets, and circular channel-  
5 ways communicating with the under pockets,  
said base having apertured cross-pieces or  
supports at the bottom, said feed-pipe run-  
ning through said cross-piece apertures and

disposed in the same vertical plane as the gen-  
erator-pipe, all being arranged substantially 10  
as shown and for the purposes described.

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Witnesses:

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