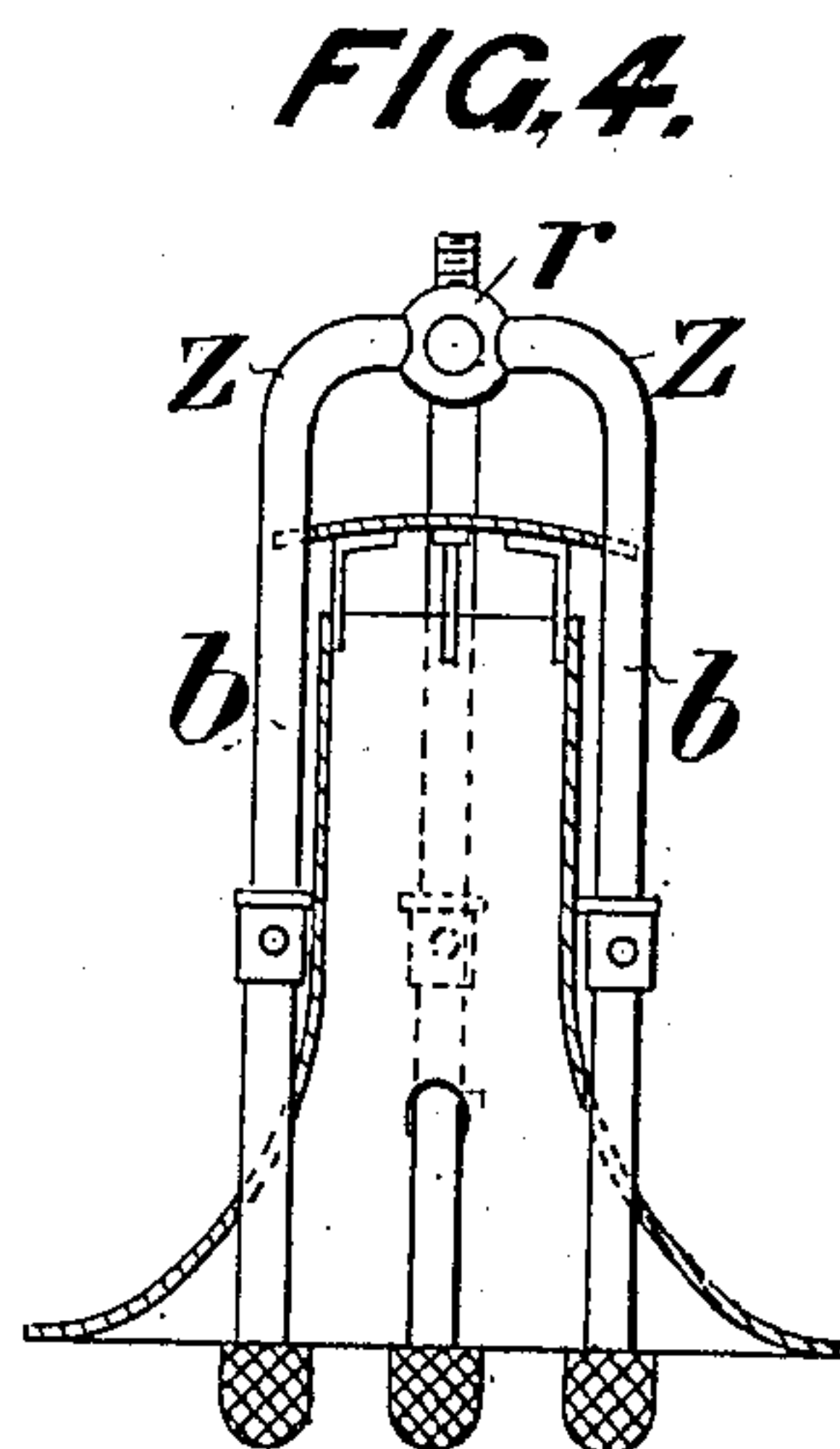
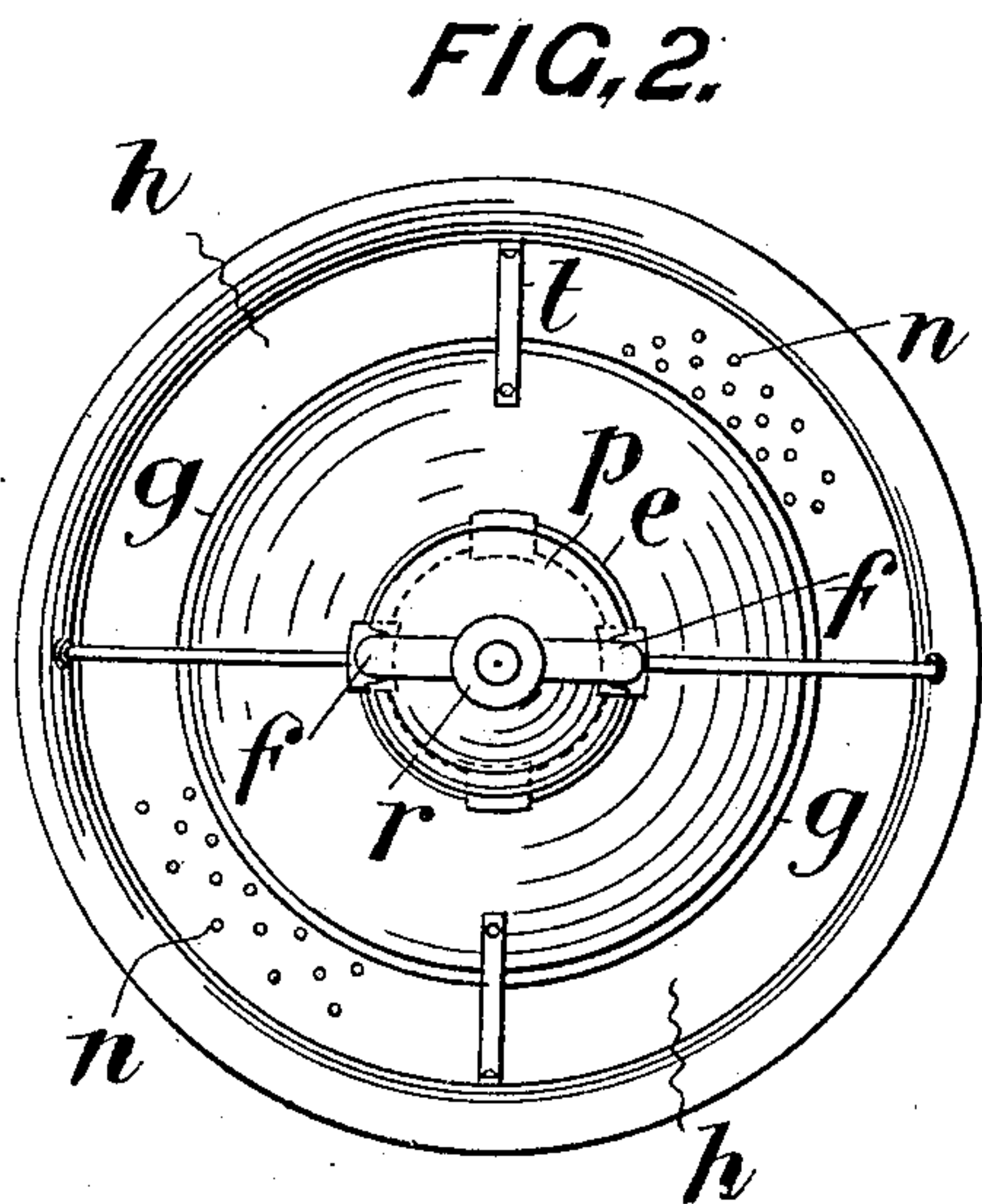
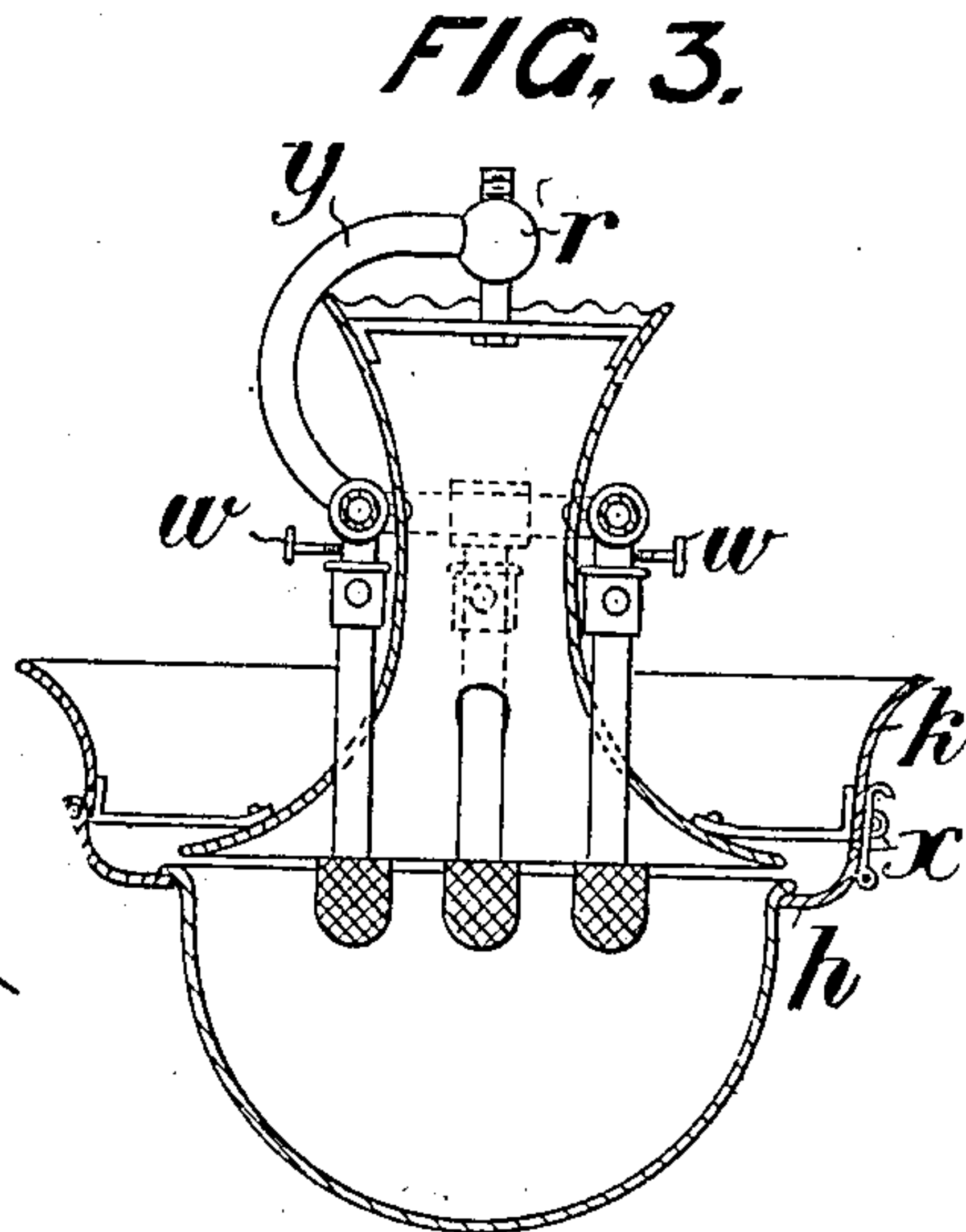
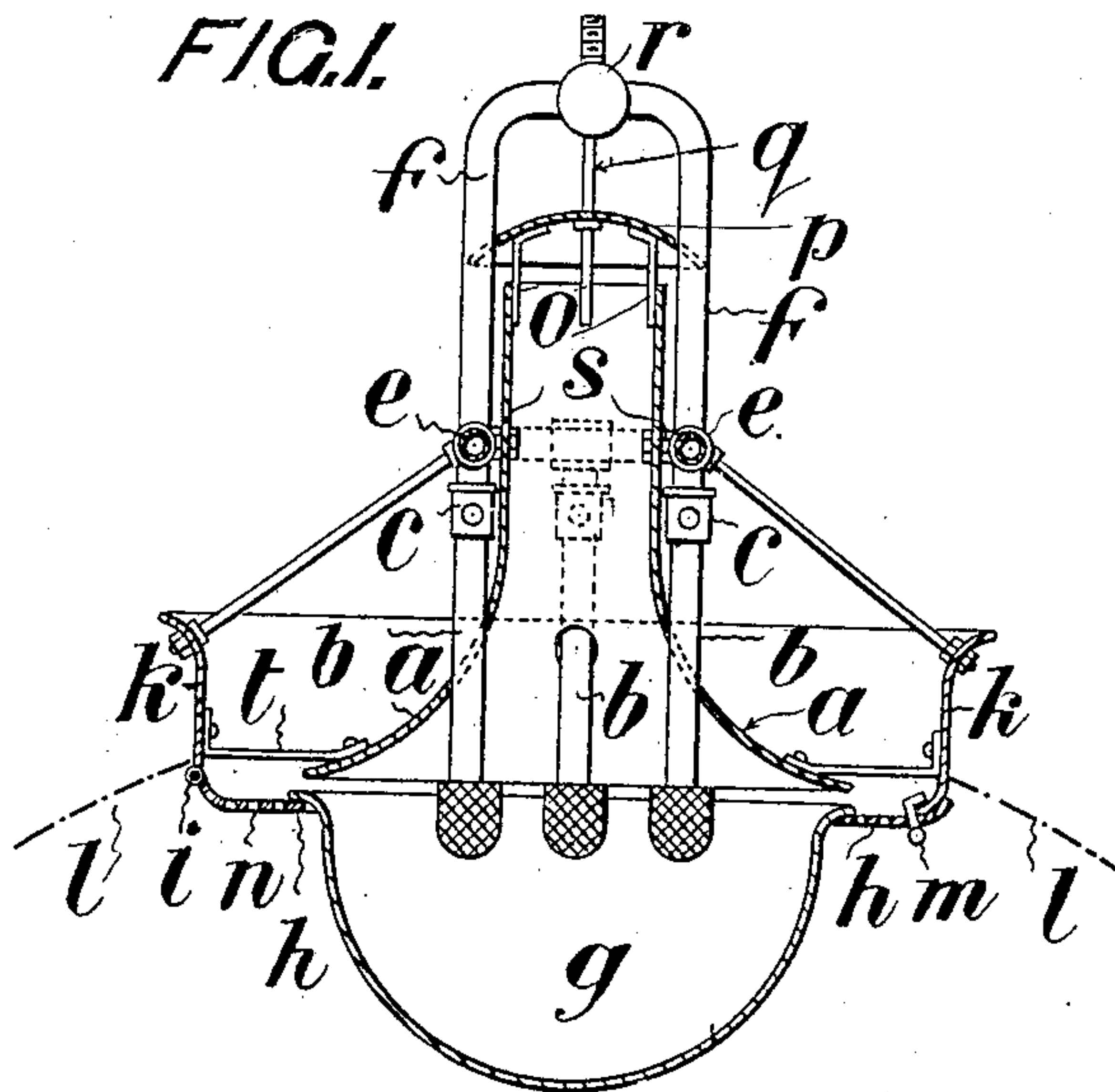


A. S. FRANCIS.  
GAS LAMP FOR INVERTED INCANDESCENT BURNERS.  
APPLICATION FILED NOV. 17, 1906.

906,623.

Patented Dec. 15, 1908.

2 SHEETS—SHEET 1.



Witnesses.  
O. M. Rommers  
Jesse H. Sutton.

Inventor  
Adolphus Sydney Francis  
by *Henry Ott*  
Atty.

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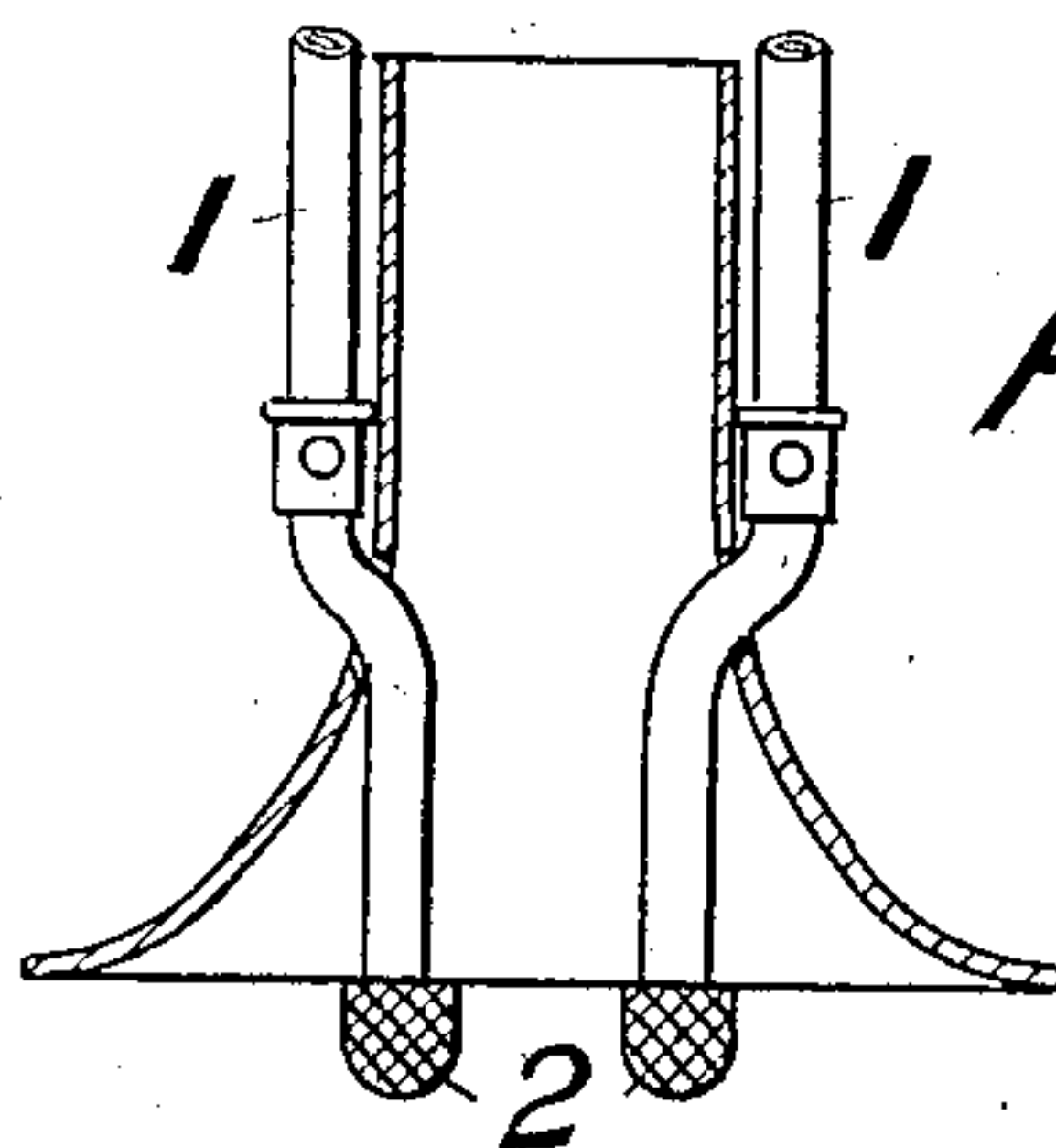


FIG. 5.

FIG. 6.

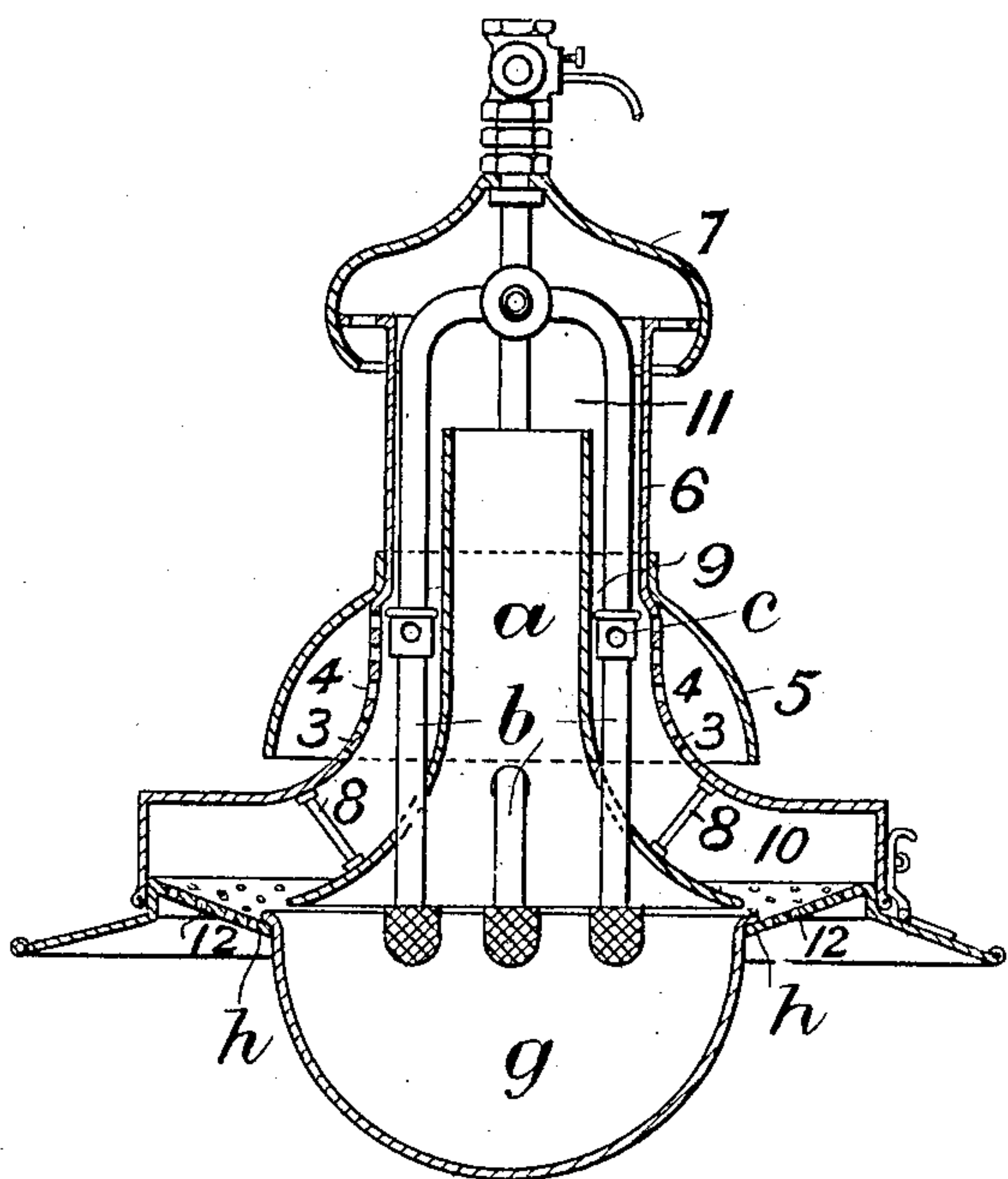
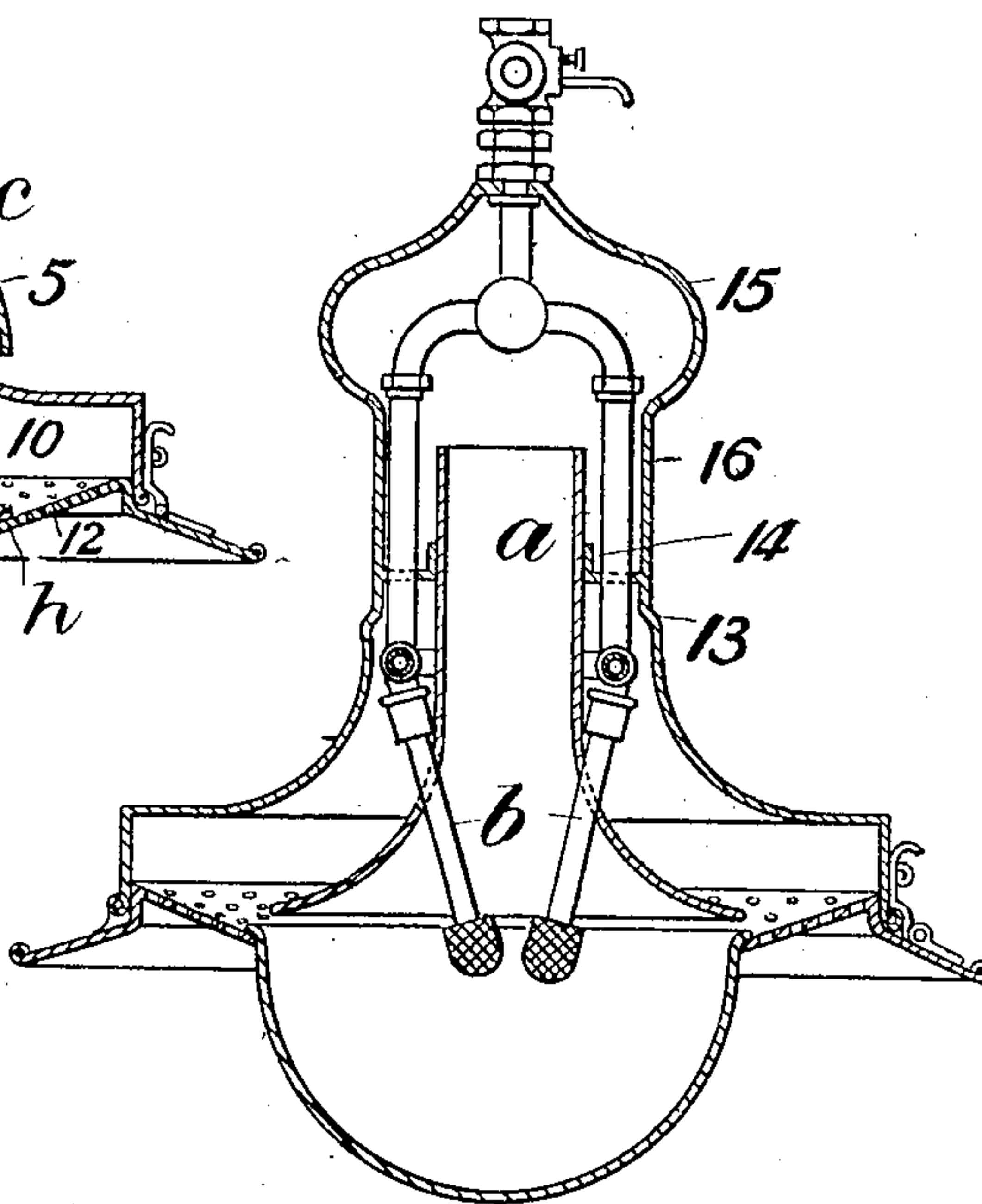


FIG. 7.



Witnesses  
O. M. Sommers  
Jesse H. Lutton

Inventor  
Adolphus Sydney Francis,  
by *Henry O. H. J.* Att'y.



# UNITED STATES PATENT OFFICE.

ADOLPHUS SYDNEY FRANCIS, OF LONDON, ENGLAND.

## GAS-LAMP FOR INVERTED INCANDESCENT BURNERS.

No. 906,623.

Specification of Letters Patent.

Patented Dec. 15, 1908.

Application filed November 17, 1906. Serial No. 343,789.

*To all whom it may concern:*

Be it known that I, ADOLPHUS SYDNEY FRANCIS, a subject of the King of Great Britain, residing at 155 Farringdon road, London, England, have invented new and useful Improvements in Gas-Lamps for Inverted Incandescent Burners, of which the following is a specification.

This invention relates to improvements in gas lamps for containing clusters of inverted incandescent burners of the type in which a cluster of two or more inverted burners is employed in a globe or lantern the invention having for object to increase the efficiency of the burners in such lamps and to render them readily accessible for cleaning, adjustment and repair.

Heretofore it has generally been the practice to employ a cluster of two or more straight burners of the ordinary inverted type with a deflector or insulator for each burner. The separate deflectors took up a good deal of space and the result was that it was impossible to arrange the lamp in a convenient form and of such a size as to allow of the necessary space for the access of sufficient pure air to supply both the mixing chamber and the flame. Besides these objections difficulty has been experienced inasmuch as the products of combustion in ascending became mixed with the pure air entering the lamp and passed into the mixing chambers, the result being that an imperfectly burning gaseous mixture was produced and the combustion at the point of the burner was not perfect.

To obviate the aforesaid drawbacks the top portions of the burners have been shut off from the bottom portions and the lamp thus divided into two parts the products of combustion escaping below such division and the air for the mixture entering above but in this case certain portions of the products of combustion enter with the fresh air. In this case it is also necessary to use a globe with air inlets at the bottom or thereabouts to supply air to the point of combustion. It has also been proposed to make a lamp of the above described type with a ring gas supply pipe and a number of so-called "bent tube" Bunsen burners connected to and arranged to project radially inwards from the said ring pipe, the said bent tube burners passing through holes in a chimney of metal or other suitable material, which chimney was flared at its

lower end or both at its lower and upper ends. Now according to this invention a chimney of this description is employed having holes in the sides thereof according to the number of burners to be used and through each hole passes a straight or vertically arranged inverted Bunsen burner, which burners are either connected to a ring supply pipe or by branches or otherwise to an ordinary gas supply pipe.

Figure 1 of the accompanying drawings illustrates in sectional elevation an indoor lamp constructed according to this invention and Fig. 2 is a plan thereof. Fig. 3 is a sectional elevation of a slightly modified form. Figs. 4 and 5 are details of other modifications in sectional elevation and Figs. 6 and 7 are similar views of two constructions of outdoor lamps.

Referring to Figs. 1 and 2 it will be seen that the lamp is provided with a trumpet-shaped chimney *a* that is to say the chimney is shaped more or less like the frustum of a cone, the wider part of which is below while the narrower part is above and if desired and as is shown the upper part may also be formed more or less cylindrical. This chimney is conveniently made of enameled iron or it may be made of other suitable material. The straight inverted burners *b* which are preferably merely straight metal Bunsen tubes provided with gas nipples and with mixing chambers *c* at the top and suitable mouthpieces and mantle supports at the bottom but without deflector or other like contrivance, pass vertically or thereabouts through holes in the side of the chimney near the lower end thereof so that the points of the burners are within the cone of the chimney, while their mixing chambers or heads *c* with their air inlets are outside of the chimney, thus the products of combustion flow straight up within the chimney, away from the air inlets. There may be two, three or more of these burners arranged equidistant from each other and parallel to the axis of the chimney (four being shown in this construction) and these burners may be connected to a circular gas pipe *e* common to all the burners, which circular pipe is connected by a bent tube or tubes *f* to the gas supply pipe which is provided with a cock for opening and closing the gas supply.

The lamp is provided with a globe *g* to prevent drafts from affecting the burners. This globe is preferably, but not necessarily, en-



5 tirely closed at the bottom and is suspended  
 from an annular plate *h* hinged at *i* or other-  
 wise connected to a ring or corona *k* which  
 forms, or may have connected thereto a re-  
 flector as shown in dotted lines and marked  
 10 7. The annular plate has on the other side  
 opposite to the hinge a latch *m* or it may be  
 a hasp or other simple fastening. This an-  
 nular plate *h* may if desired be provided with  
 a number of holes *n* to admit air to the inter-  
 15 10 of the globe to support the combustion  
 of the flames, and if desired to the upper part  
 of the lamp for the supply of additional air  
 to the mixing chamber but unless the upper  
 15 part of the lamp is inclosed it is not abso-  
 lutely essential. The chimney may be held  
 in position by means for instance of small  
 brackets *o* fixed to the smoke shade or bell *p*  
 and the latter is suitably attached by a lug *q*  
 20 to the main gas supply pipe connection *r*.  
 The chimney may also in addition be at-  
 tached to the pipes by screws or lugs *s* and  
 below it is fixed to the corona *k* by brackets *t*.  
 The corona is further supported by stays *u*  
 25 from the gas supply pipes *f*.

Instead of making the chimney in the form  
 of the frustum of a cone below and if desired  
 also more or less cylindrical at the top as  
 shown in Fig. 1 it may as shown in Fig. 3 and  
 30 marked *v* be flared at both ends. Further  
 each burner may also be provided with a  
 valve *w* so that in case a mantle should be  
 damaged or destroyed it is easy to shut off  
 the supply of gas to take away the damaged  
 35 mantle and to replace it by a new one. In  
 this example the annular plate *h* is shown ad-  
 justably secured to the corona *k* by means of  
 a hasp *x*. Further the circular gas supply  
 pipe *e* is connected to the main gas supply *r*  
 40 by a single bent tube *y*.

If desired and as shown in Fig. 4 each  
 burner *b* is connected by a separate supply  
 pipe *z* leading from the main supply pipe *r* at  
 the top of the lamp instead of being all con-  
 45 nected to a common circular or ring gas sup-  
 ply pipe.

Fig. 5 shows a chimney having only two  
 burners (but there might be more) and the  
 burner tubes 1 parallel and straight for the  
 50 greater part of their length but provided  
 with two bends so that the mantles 2 may be  
 closer together without necessitating any  
 restriction in the diameter of the chimney.  
 If the lamp be intended for use out of doors,  
 55 the upper part of the lamp is as shown in  
 Fig. 6 incased and provided with a domed or  
 otherwise shaped top to prevent the ingress  
 of rain and wind the products of combustion  
 rising up the cone shaped chimney and es-  
 60 caping by way of openings below the top or  
 cowl of the lamp as is usual with street lamps.  
 The lower part of the chimney *a* is inclosed  
 by an outer chimney 3 so as to leave suffi-

65 cient space for the air to pass to the mixing  
 chambers of the burners. This outer chim-  
 ney may also be provided with holes 4 for the  
 admission of air to supply the burners and  
 such holes may be shielded from rain and di-  
 rect drafts or wind by an annular cap or cov-  
 70 ering 5. The holes 4 however are not essen-  
 tial and if they are dispensed with the annu-  
 lar cap is also superfluous. The outer chim-  
 ney 3, its extension 6 and the top 7 may be  
 in one piece or substantially so or as shown  
 the top 7 is separate while the extension 6 75  
 and the outer chimney 3 are in one piece.  
 The inner cone shaped chimney *a* is fixed  
 therein by means of stays 8, the spaces be-  
 tween the inner and outer chimneys being  
 divided by a plate 9 or other contrivance, 80  
 thus separating the annular space into two  
 parts the lower part 10 containing the heads  
 of burners effectually shutting same off from  
 the upper part 11 which contains products of  
 combustion because the upper end of the 85  
 chimney *a* opens into same. Air is admitted  
 through the perforations 12 in the annular  
 plate *h* aforesaid some of which passes into  
 the globe *g* while the rest passes between the  
 outer chimney 3 and the inner chimney *a* to 90  
 supply air to the mixing chambers of the  
 burners. Or as shown in Fig. 7 the burners *b*  
 are not quite vertical being slightly inclined  
 towards each other the outer chimney 13  
 may be fitted to the inner chimney *a* by the 95  
 flanged part 14 and the top 15 of the lamp  
 may be made in one piece with the annular  
 extension 16.

What I claim as my invention, and desire  
 to secure by Letters Patent is:—

100 An inverted incandescent gas lamp com-  
 prising a gas supply pipe, a flared chimney  
 presenting on its interior an inwardly convex  
 gradually curving surface, a number of  
 straight inverted Bunsen burner tubes pass- 105  
 ing through said chimney at some distance  
 from the lower end thereof, a supply pipe  
 connected with said Bunsen tubes, air inlets  
 to said tubes above the points of intersection  
 with said chimney, mantle supporting means 110  
 upon the free end of each burner, the points  
 of the burners with the mantle-supporting  
 means being within the circumference of the  
 flared chimney, a globe support and a globe  
 seated in said support and having its upper 115  
 edge situated in about the same plane as that  
 containing the lower edge of the chimney,  
 substantially as set forth.

In testimony whereof I have signed my  
 name to this specification in the presence of 120  
 two subscribing witnesses.

ADOLPHUS SYDNEY FRANCIS.

Witnesses:

V. JENSEN,  
H. D. JAMESON.