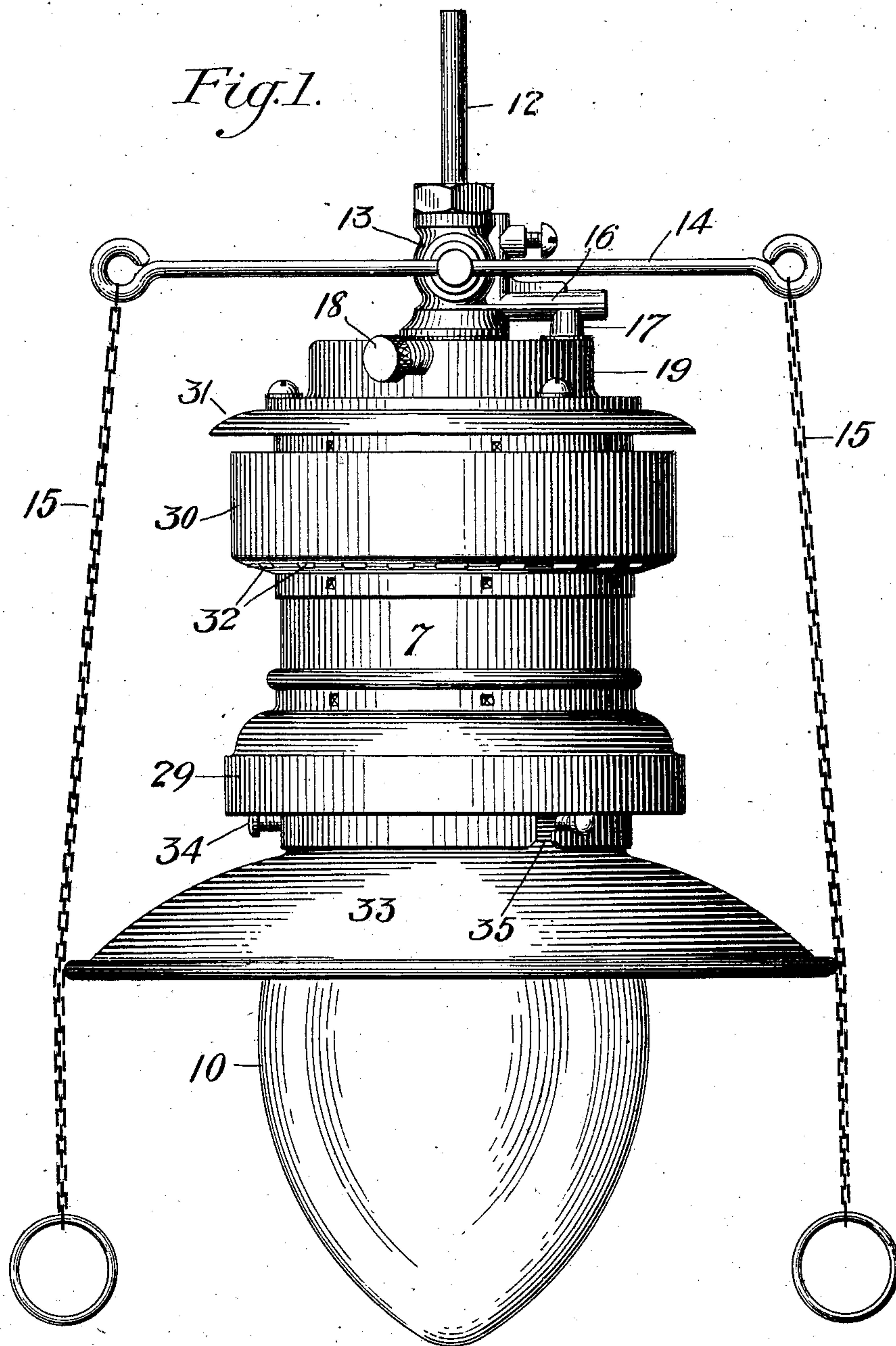


J. MAAS.  
INCANDESCENT GAS LAMP.  
APPLICATION FILED SEPT. 18, 1909.

973,950.

Patented Oct. 25, 1910.

4 SHEETS—SHEET 1.



Witnesses:  
D. W. E. E. E.  
J. B. E. E. E.

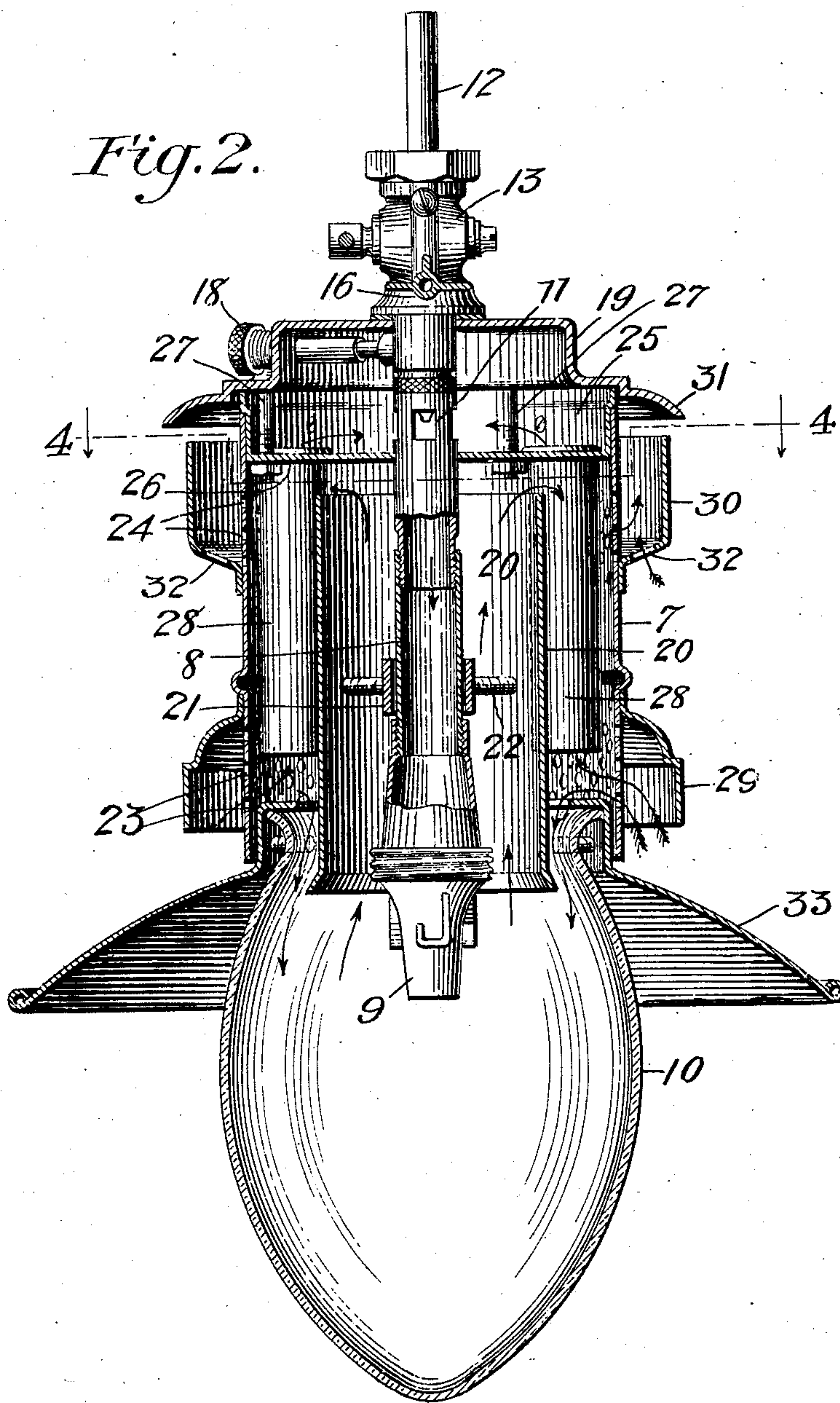
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4 SHEETS—SHEET 2.



Witnesses:  
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4 SHEETS-SHEET 3.

Fig. 3.

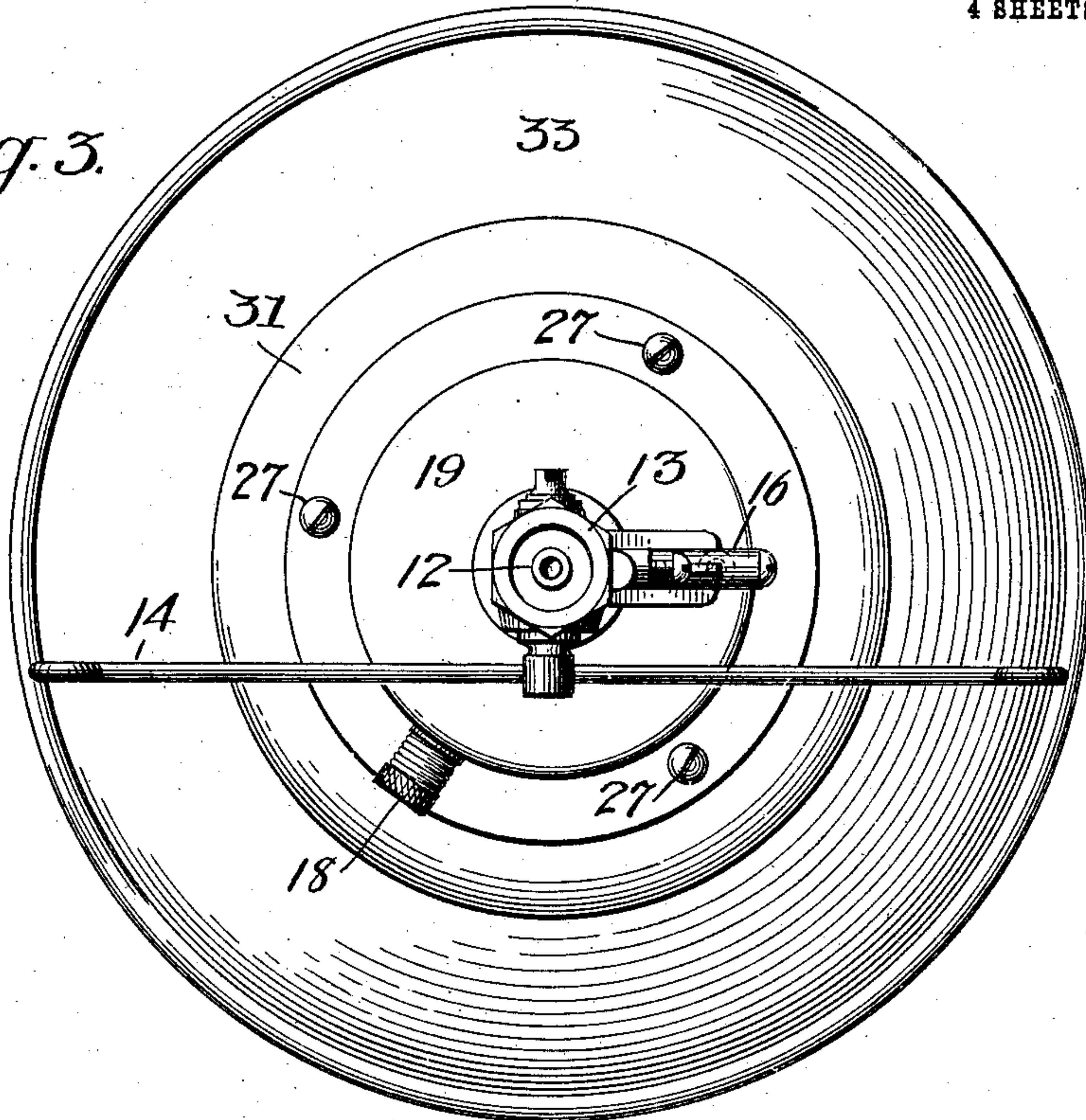
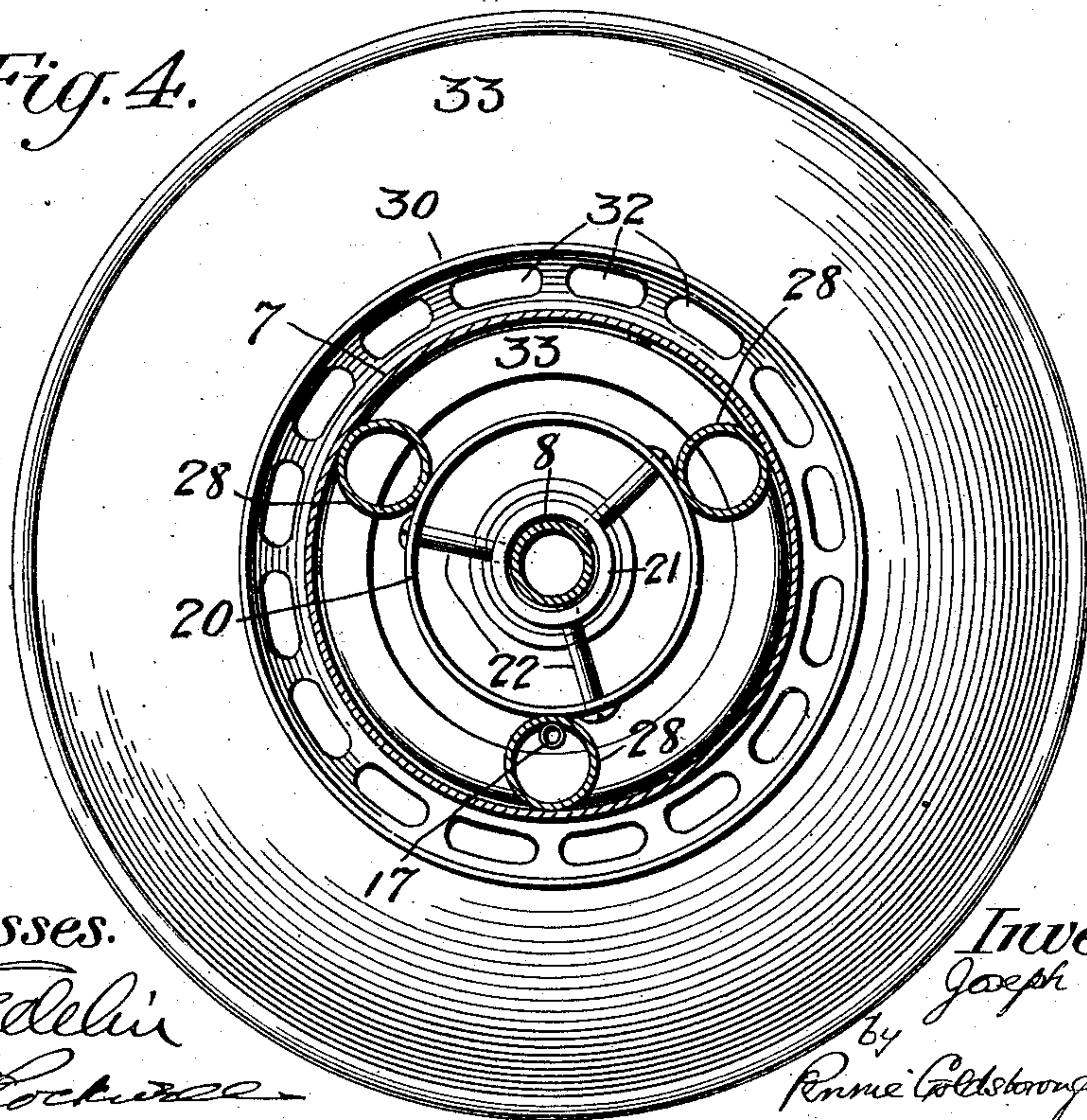


Fig. 4.



Witnesses.

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Inventor:  
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By  
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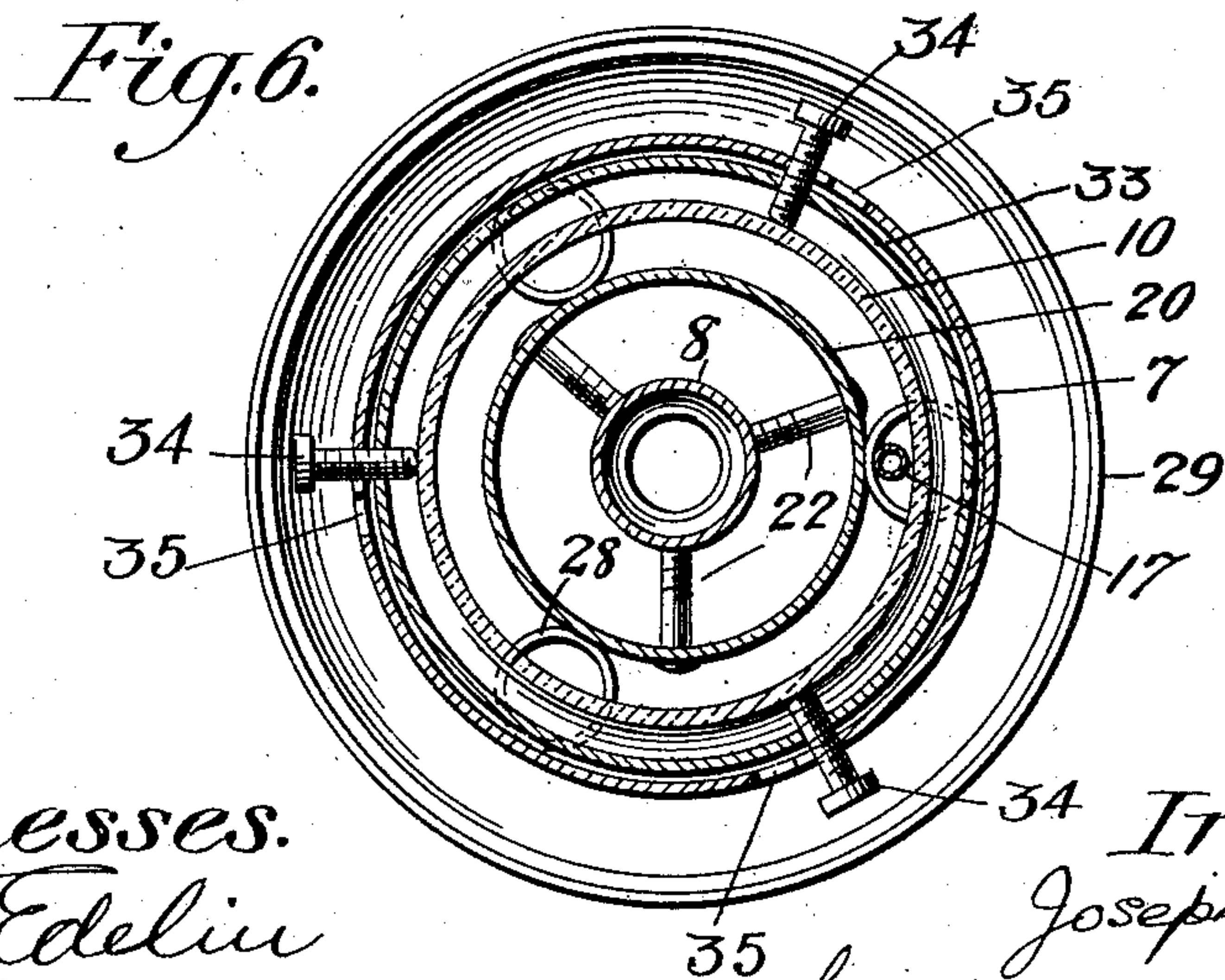
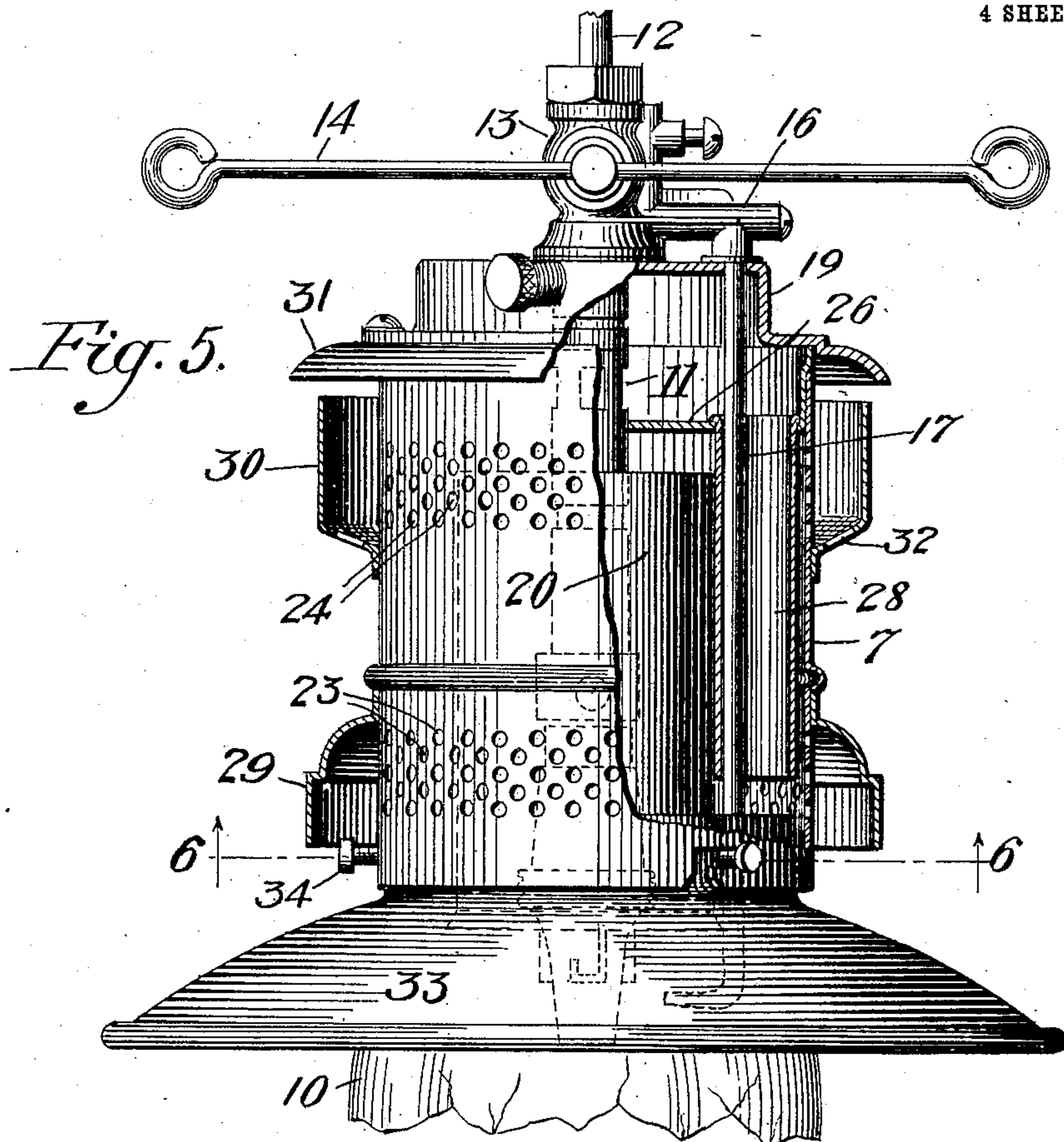


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4 SHEETS—SHEET 4.



Witnesses.  
D. W. Edelin  
J. H. Rockwell

Inventor:  
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# UNITED STATES PATENT OFFICE.

JOSEPH MAAS, OF KALAMAZOO, MICHIGAN, ASSIGNOR TO AMERICAN GAS LIGHT COMPANY, OF KALAMAZOO, MICHIGAN, A CORPORATION.

INCANDESCENT GAS-LAMP.

973,950.

Specification of Letters Patent.

Patented Oct. 25, 1910.

Application filed September 18, 1909. Serial No. 518,318.

*To all whom it may concern:*

Be it known that I, JOSEPH MAAS, a citizen of the United States, residing at Kalamazoo, county of Kalamazoo, and State of Michigan, have invented certain new and useful Improvements in Incandescent Gas-Lamps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to incandescent gas lamps, and the object of the invention is to provide an improved lamp for outdoor use in which the burner can, if desired, be of the inverted type, although the invention is not necessarily limited to such an arrangement.

The improved lamp is of the type shown in the patent to Gordon, 748,363, December 29, 1903, in so far as the use of a lower zone of inlet openings in the casing for the air, and an upper zone of similar outlet openings, is concerned, and the invention aims to improve the lamp described in said patent with a view of making it better adapted for outdoor use and also employing an inverted burner if such is desired, as stated above.

The improvements relate particularly to the arrangement of the preheating chamber in which atmospheric air is introduced and heated before being fed to the burner, and also to the means for collecting such air, introducing it into the preheating chamber and providing for its heating during such introduction.

The invention also aims to provide an improved connection between the reflector, casing and globe, whereby the globe and reflector may be instantly attached to the lamp and removed therefrom, and to improve other details of the lamp construction, as will appear from the following description.

In the accompanying drawing, Figure 1 is a front elevation of an incandescent gas lamp constructed in accordance with the invention. Fig. 2 is a vertical central section of the same. Fig. 3 is a top plan view of the lamp. Fig. 4 is a horizontal section on line 4—4 of Fig. 2, Fig. 5 is a detail view of the upper portion of the lamp, certain parts being broken away to show the interior con-

struction, and Fig. 6 is a horizontal section 55 on the line 6—6 of Fig. 5.

In the drawing, the casing 7 of the lamp is illustrated as being of cylindrical form, and passing down through said casing is a Bunsen burner 8 having a nozzle 9 that enters a globe 10. The nozzle 9 is intended to receive and suspend a mantle of the inverted type (not shown), but the arrangement of the parts at the discharge end of the burner tube may be varied widely without affecting the gist of the invention. At its upper portion, within the upper part of the casing, the burner tube 8 is provided with the usual air inlets 11 and said tube is suspended, together with the lamp as a whole, from a gas inlet pipe 12, there being interposed between said gas pipe and the Bunsen burner a suitable valve 13 to control the passage of the gas. This valve may be of any preferred type and is preferably operated in the usual manner by a cross piece 14 and depending chains 15, as shown in Fig. 1. The valve 13 is provided with an extension 16 through which the gas enters, in the usual way, into a pilot tube 17 that leads downward through the casing to a point adjacent the burner nozzle, as will appear more clearly hereinafter. The Bunsen burner is regulated in the ordinary way by means of an adjusting screw 18, which passes in horizontal direction through the side wall of the casing at the top thereof, which is formed by a cap 19 upon the upper surface of which the valve 13 is positioned. The burner tube 8 serves as a support for a chimney 20 that is located at the center of the casing and concentrically with said burner tube, said chimney extending from the bottom of the casing to a point near the top thereof. The connection between the chimney and the burner tube is effected by means of a ring 21 that surrounds the burner tube, at the intermediate portion of the latter, as shown in Fig. 2, said ring having tapped openings therein through which screws 22 are threaded. Said screws are also threaded through the chimney and extend in horizontal direction and radially of the burner tube against which they abut at their inner ends in such a way as to effectively support the chimney on said tube.

The air to support combustion is sucked into the lamp casing through a horizontal



zone of perforations 23 that form inlet openings adjacent the lower edge of the casing, and the products of combustion pass off from the lamp by way of an upper zone of similar openings 24 arranged near the top of the casing. This arrangement of the inlet and outlet openings is similar to that described in the Gordon patent previously mentioned, but the mixing of the air and gas is effected in an entirely different manner. According to this invention, there is formed at the upper part of the casing a preheating chamber 25 located immediately beneath the cap 19 and surrounding the air supply 11 of the burner. The bottom of said chamber is formed by a partition 26 set in the upper part of the casing and secured thereto in any suitable manner, such as by the screws shown in Fig. 2. It is to this partition 26 that the cap 19 is secured, this being effected by means of bolts 27 (Fig. 2), and through the connections described the entire lamp structure is firmly supported from the gas inlet pipe. The bolts 27, which secure the cap to the diaphragm or partition 26, and therefore to the lamp casing as a whole, are preferably located near the outer edge of the cap, as shown in Fig. 3.

The air to be fed to the burner is led upward to the preheating chamber by means of a number of flues or tubes 28 that are located between the chimney and the side wall of the casing, as shown in Fig. 2; said flues or tubes extend down into proximity to the inlet openings 23 so that a certain amount of the air that is sucked into the casing is conducted upward into the preheating chamber. The tubes or flues 28 lead through the horizontal partition or diaphragm 26, and are preferably secured thereto by upsetting said tubes at their upper ends, as shown in Fig. 2.

The lower and upper series of air openings in the casing are protected by means of annular hoods 29—30 respectively, said hoods being secured to the casing in any suitable manner. The lower hood 29 is open at the bottom in order to cause an upward draft of air to pass into the casing through the openings 23, whereas the hood 30 is faced in the opposite direction, viz. it is open at the top and so arranged as to conduct in upward direction the products of combustion that pass out of the outlet openings 24. Said outlet openings are further protected by means of a ledge or rim 31 that is formed at the edge of the cap 19 and overhangs the hood 30, being in rather close proximity to the upper edge of the latter. At its lower portion, the hood 30 is provided with a series of openings 32 to promote an upward draft through the hood that will effectively carry off the products of combustion. The air and products of combustion take the course indicated by the arrows in Fig. 2.

I have found it advisable to make the

pilot tube 17 previously mentioned pass downward through one of the air tubes or flues 28 as shown in Fig. 5. This arrangement has the advantage that no separate opening in the partition or diaphragm 26 for the pilot tube is necessitated, and that the parts may be readily dismantled and put together.

The globe 10 which incloses the mantle and burner nozzle, is detachably secured at its upper end to the rim of a reflector 33 by means of screws 34 that engage in the grooved upper end of the globe. The reflector and the globe are supported from the casing by the engagement of said screws 34 in a series of angular slots 35. In order to place the reflector and globe in position at the same time it is only necessary to raise said parts, while connected in the manner indicated, until the screws 34 enter the lower open ends of the angular slots 35, which slots are arranged at the extreme lower edge of the casing, whereupon the reflector and globe are turned as a unit to engage the screws 34 in the horizontal branches of the angular slots, so that the reflector and globe will be supported. It is obvious that the reflector and globe may be incidentally detached from the lamp by simply giving the reflector or the globe a twist in a direction opposite to that first indicated, whereupon the screws will be released from the slots.

In the operation of the improved lamp, the air is sucked into the casing through the lower zone of perforations 23, as before stated, and a certain amount of such air passes downward at the side of the chimney and into the globe, where it supports combustion. Another part of the air thus introduced, however, is sucked into the lower ends of the upright air tubes 28, whereupon it rises until it reaches the preheating chamber 25 and is fed into the burner through the air inlets 11. During the upward progress of the air through the tubes 28, the same is subjected to a thorough heating action inasmuch as the tubes 28 absorb a considerable amount of heat from the chimney, in close proximity to which they are located, and also because the products of combustion which rise through said chimney are given off in lateral direction at the upper edge of the chimney so as to pass around said tubes in a substantially horizontal direction to the outlet openings 24, as indicated by the arrows in Fig. 2. Not only are the tubes 28 heated, but also the preheating chamber 25, it being evident that a large amount of heat will be absorbed by the diaphragm or partition 26, which is located immediately above the upper edge of the chimney. In this way, the air that is to be fed to the burner is effectively preheated during its passage from



the inlet openings to the burner. After the products of combustion pass out of the openings 24 they are carried off upwardly through the inverted hood 30, as previously indicated. Gusts of wind have practically no effect on the discharge of such products of combustion owing to the arrangement of the hood and the ledge 31 overhanging the same in the manner previously described.

10 In the same way, the introduction of the air into the casing is controlled and made uniform by means of the hood 29.

The upright air tubes or flues form a very important feature of the invention as they provide for the effective supply of preheated atmospheric air to the burner and it is the use of such air tubes or flues that makes possible a successful outdoor lamp of the inverted type. The tubes are also extremely advantageous for the reason that they prevent the products of combustion, as they pass out of the lamp, from mixing with the incoming fresh air.

It is obvious that I have not attempted to describe all of the numerous modifications of the lamp that may be adopted without digressing from my inventive idea. In particular I wish it to be understood that although I have mentioned the burner tube as having a plural number of air inlets, the claims are intended to cover a construction in which a single air inlet is used.

What I claim is:—

1. In an incandescent gas lamp, a casing having a zone of outlet openings in its side wall, a burner tube extending down through the casing and having air inlets, and a preheating chamber inclosing said air inlets and having a substantially horizontal bottom closed to the passage of the products of combustion and extending completely across the space defined by the aforesaid side wall, above but adjacent said outlet openings.

2. In an incandescent gas lamp, a casing having outlet openings in its side wall, a burner tube extending down through the casing and having air inlets, a preheating chamber inclosing said air inlets and having a substantially horizontal bottom extending completely across the space defined by the aforesaid side wall, above but adjacent said outlet openings, and means to isolate a portion of the air rising in the casing and to supply it to said preheating chamber through the bottom of the latter.

3. In an incandescent gas lamp, a casing, a burner tube extending downward therein and having air inlets, a preheating chamber within the casing surrounding said air inlets, means to lead air up through the casing and into said chamber, and a chimney surrounding the burner tube and having its upper edge spaced from, but in close proximity to, the bottom of said preheating chamber.

4. In an incandescent gas lamp, a casing

having outlet openings in its side wall, a burner tube extending down through the casing and having air inlets, a preheating chamber inclosing said air inlets and arranged with its bottom extending completely across the space defined by the casing side wall, and a chimney having its upper edge in close proximity to the bottom of said chamber but spaced from the same to permit the escape of the gases in a lateral direction toward said outlet openings.

5. In an incandescent gas lamp, a casing, a burner tube therein, a preheating chamber inclosing the upper portion of the burner tube and having its bottom extending completely across the space defined by the casing side wall, a chimney surrounding the burner tube and having its upper edge spaced from the bottom of said preheating chamber, and air tubes or flues around the chimney, leading upward to said preheating chamber.

6. In an incandescent gas lamp, the combination of a casing, a burner tube therein having air inlets, a preheating chamber in the upper part of the casing and inclosing said air inlets, a chimney surrounding the burner tube, air tubes arranged in the space between the chimney and casing and debouching into the preheating chamber, means to admit atmospheric air into the lower part of the casing and the lower ends of the air tubes, and means to permit the escape of the products of combustion that strike the bottom of the preheating chamber and surround the air tubes.

7. In an incandescent gas lamp, the combination of a casing having a lower zone of inlet openings and an upper zone of outlet openings in its side wall, a burner tube in the casing having air inlets at the upper part thereof, a preheating chamber in the casing inclosing said air inlets at a point above the zone of outlet openings, a chimney surrounding the burner tube, and over the top edge of which the products of combustion flow laterally, and a series of devices to isolate a portion of the incoming air and conduct it upward from the inlet openings to the preheating chamber.

8. In an incandescent gas lamp, the combination of a casing having a lower zone of inlet openings and an upper zone of outlet openings, a burner tube in the casing having air inlets at the upper part thereof, a preheating chamber inclosing said air inlets at a point above the zone of outlet openings, a chimney surrounding the burner tube, and a series of air tubes communicating with the preheating chamber and arranged in the space between the side wall of the casing and the chimney.

9. In an incandescent gas lamp, the combination of a casing, a burner tube passing downward through the casing and having



air inlets therein, a horizontal partition or diaphragm within and secured to the upper portion of the casing, a cap above said partition or diaphragm and forming in connection therewith a preheating chamber that incloses said air inlets, and bolts securing said cap to the diaphragm.

10 In an incandescent gas lamp, the combination of a casing, a burner tube therein having air inlets, a horizontal partition or diaphragm within and secured to the upper portion of the casing below said air inlets, a cap extending across and closing the top of the casing above said air inlets, means to 15 secure said cap detachably to said diaphragm, and means to introduce air into the space between the cap and diaphragm.

11. In an incandescent gas lamp, the combination of a casing having a horizontal 20 zone or series of outlet openings, means in the casing to direct the products of combustion to and through said openings, an inverted annular hood surrounding the casing and serving to conduct the products of com-

bustion in an upward direction, and a cap 25 having a ledge overhanging said hood.

12. In an incandescent gas lamp, the combination with a casing having a series of outlet openings, of an annular inverted hood applied to the wall of the casing adjacent 30 said openings and surrounding the casing, said hood being entirely open at the top and provided at its lower part with a series of air openings.

13. In an incandescent gas lamp, the com- 35 bination of a casing, a burner tube in the casing having air inlets, a preheating chamber inclosing said air inlets, an air tube communicating with the preheating chamber, and a pilot tube extending through the air 40 tube.

In testimony whereof I affix my signature, in presence of two witnesses.

JOSEPH MAAS.

Witnesses:

JOHN L. HOLLANDER,  
A. C. DENISON.