

(No Model.)

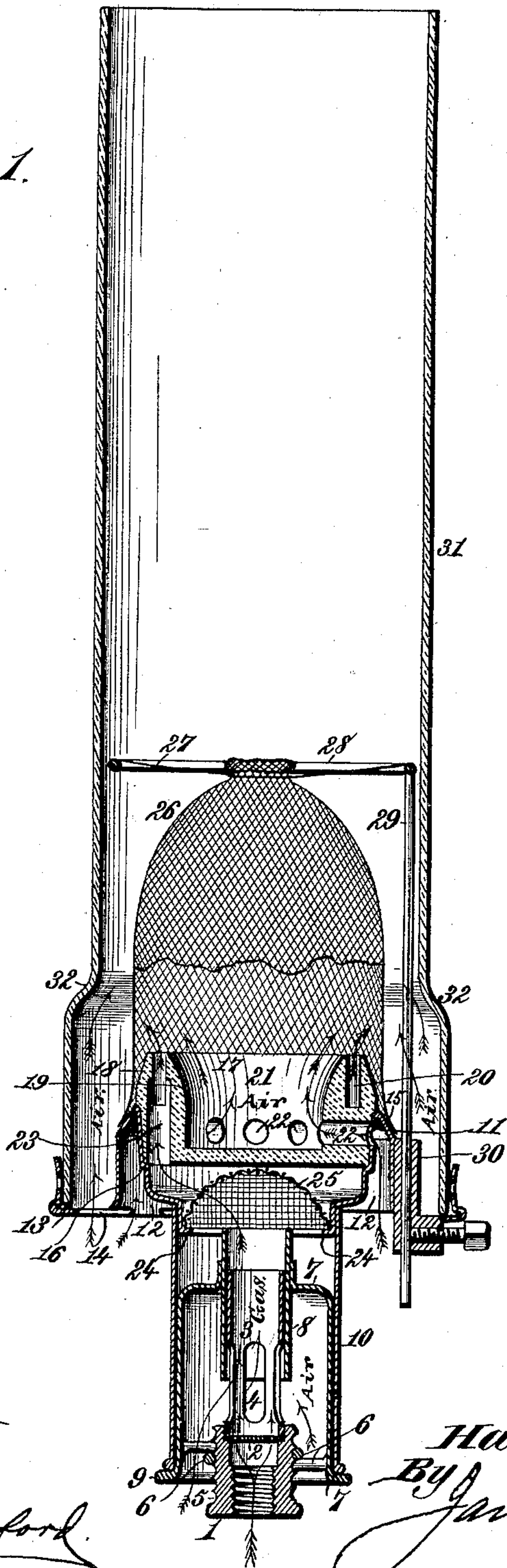
2 Sheets—Sheet 1.

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INCANDESCENT GAS LAMP.

No. 409,554.

Patented Aug. 20, 1889.

Fig. 1.



Witnesses
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Fig. 2.

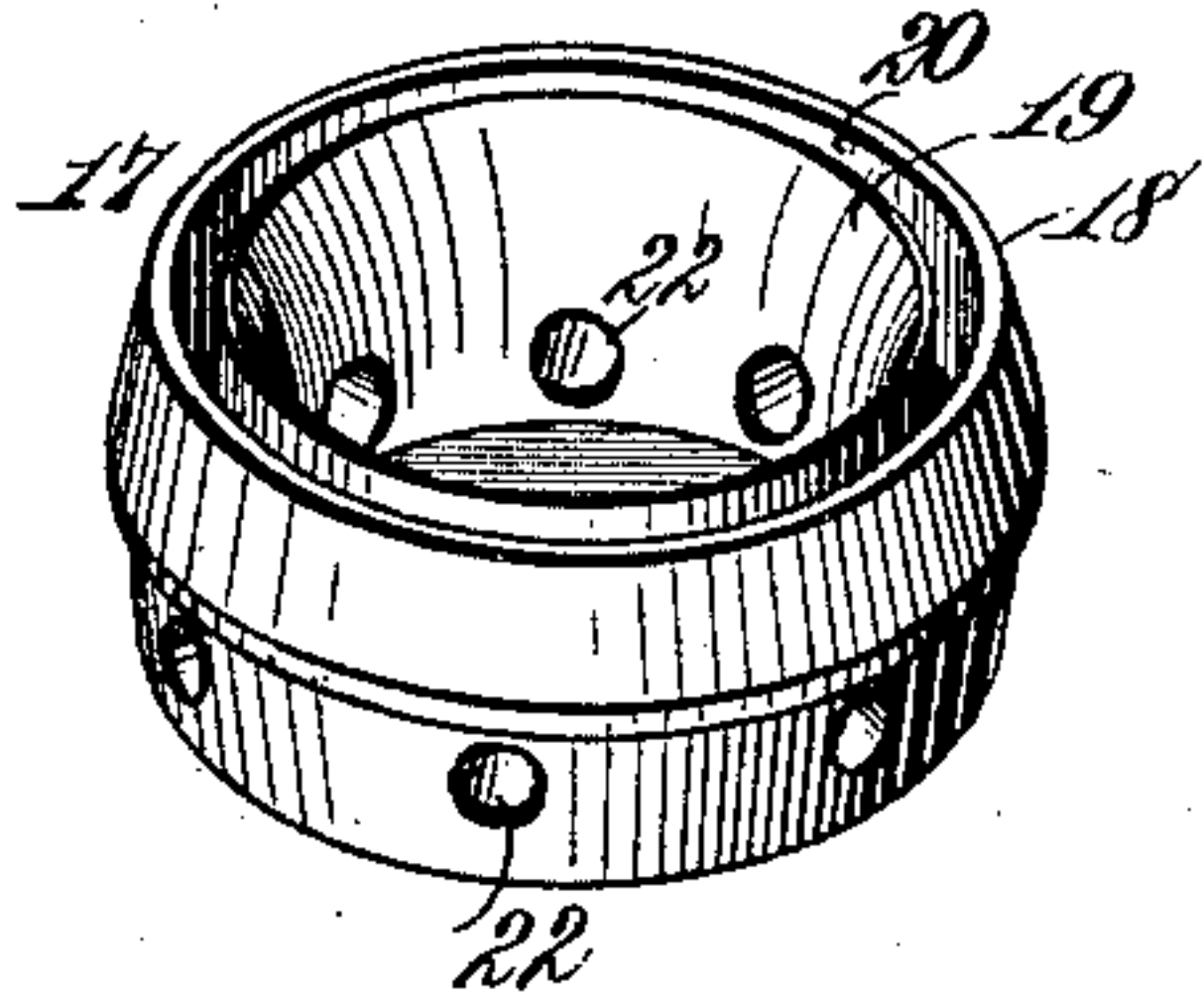


Fig. 3.

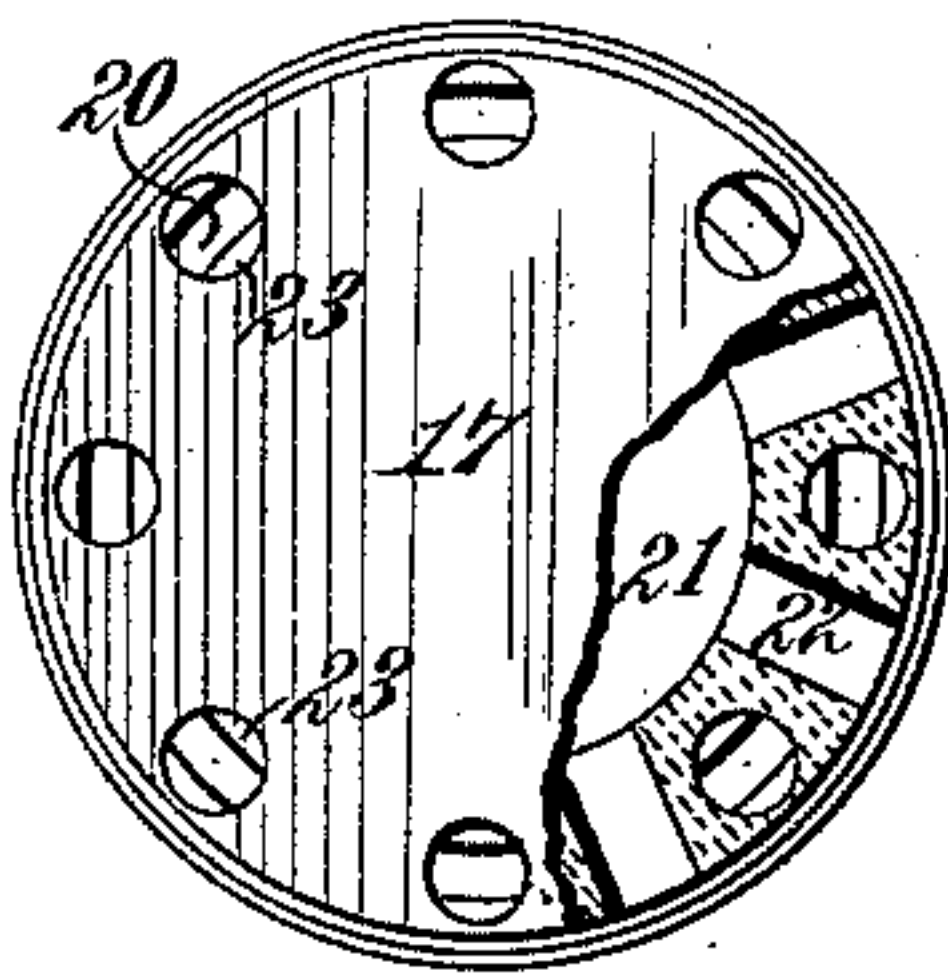


Fig. 4.

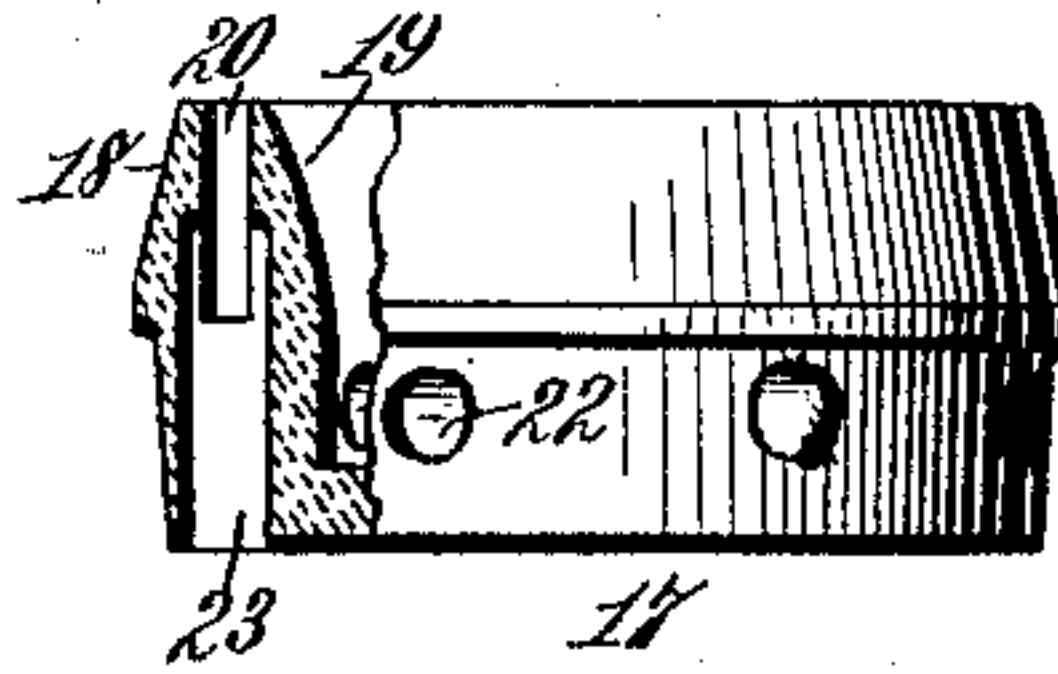


Fig. 5.

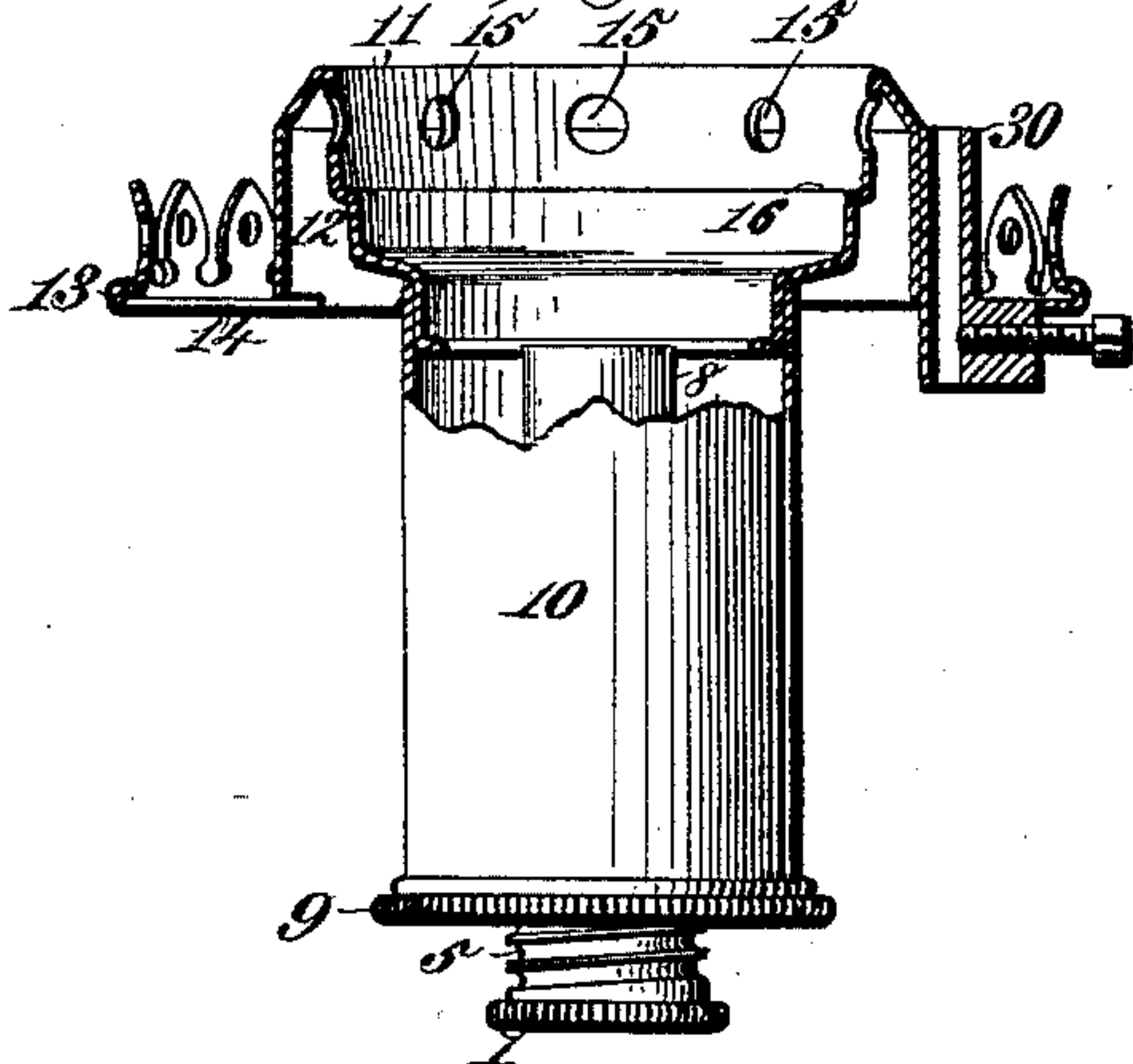


Fig. 6.

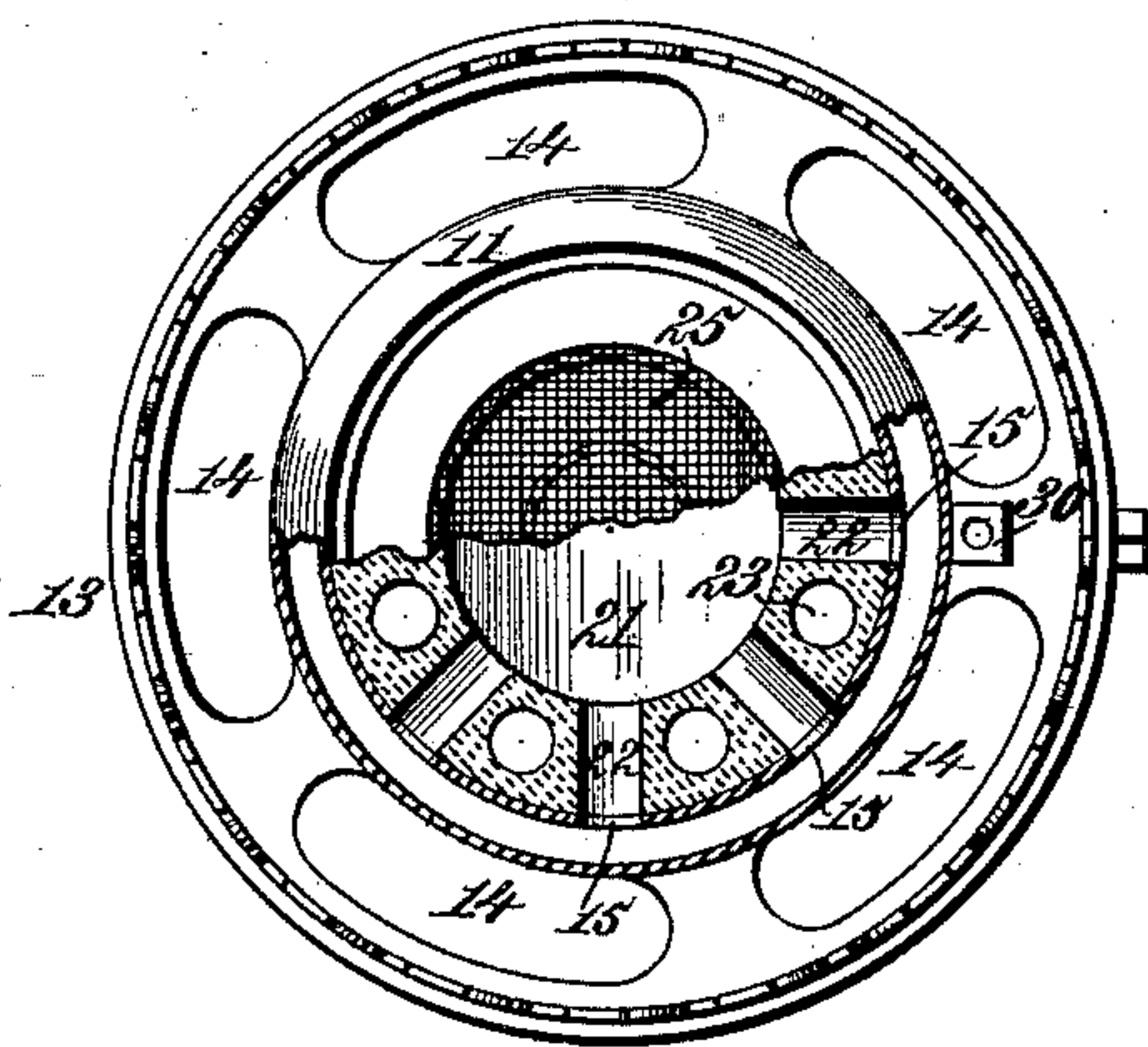


Fig. 7.

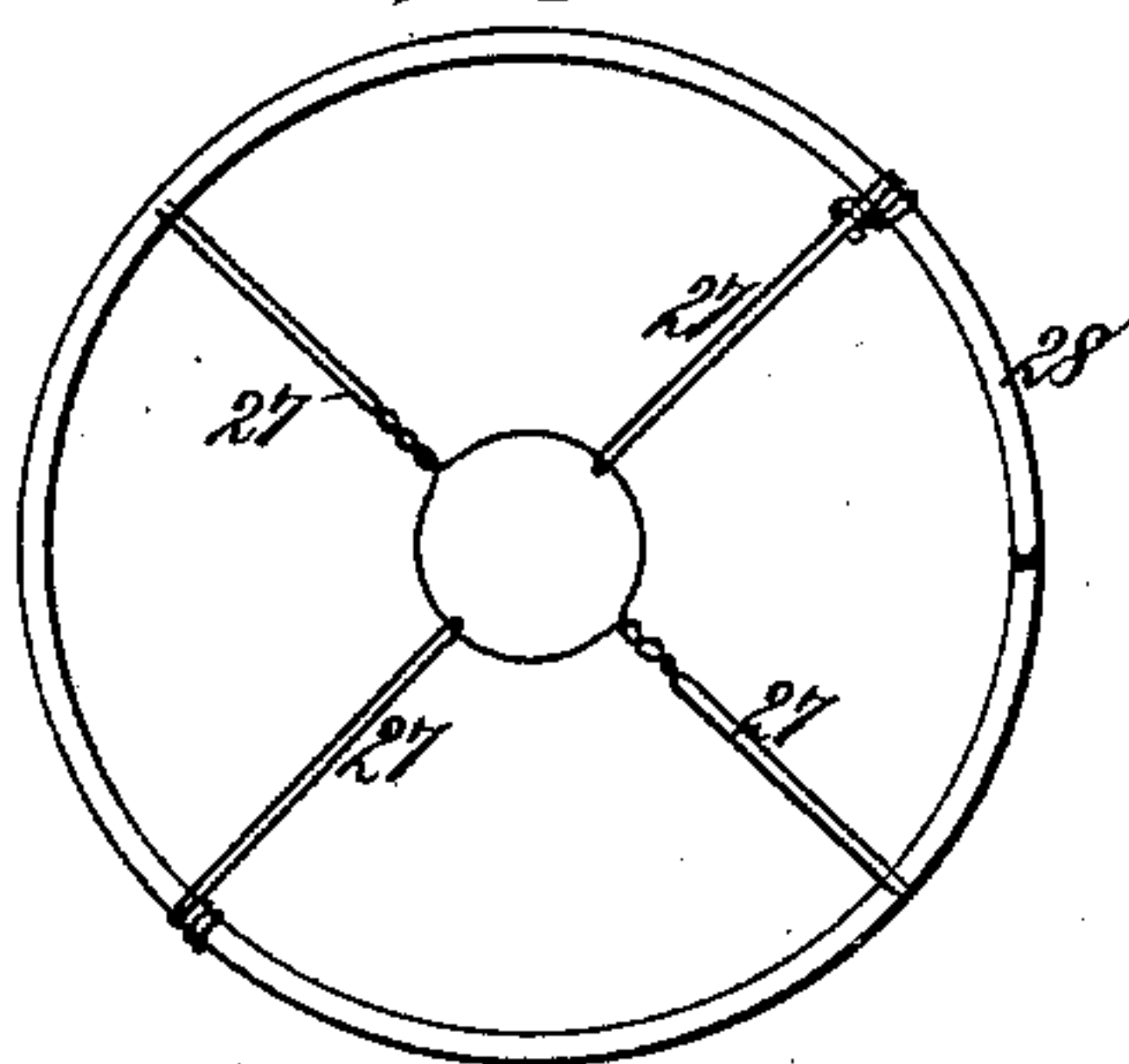
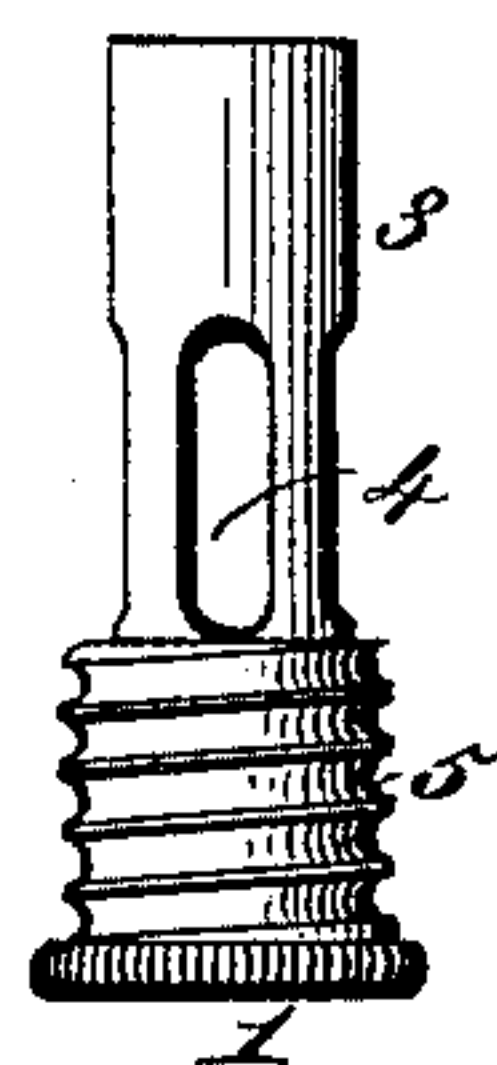


Fig. 8.



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UNITED STATES PATENT OFFICE.

HAROLD J. BELL, OF GLOUCESTER CITY, ASSIGNOR TO THE WELSBACH INCANDESCENT GAS LIGHT COMPANY, OF NEW JERSEY.

INCANDESCENT GAS-LAMP.

SPECIFICATION forming part of Letters Patent No. 409,554, dated August 20, 1889.

Application filed July 2, 1888. Serial No. 278,739. (No model.)

To all whom it may concern:

Be it known that I, HAROLD J. BELL, a citizen of the United States, residing at Gloucester City, in the county of Camden and State of New Jersey, have invented new and useful Improvements in Incandescent Gas-Lamps, of which the following is a specification.

This invention relates to an Argand gas-lamp especially adapted for incandescent illumination; and it consists in the novel features of construction and combination of devices hereinafter set forth.

In the annexed drawings, illustrating the invention, Figure 1 is a vertical section of my improved Argand gas-lamp arranged for incandescent illumination. Fig. 2 is a perspective view of the Argand burner. Fig. 3 is a bottom plan of the same, partly in section. Fig. 4 is an elevation of the burner, partly in section. Fig. 5 is a sectional elevation of a portion of the lamp. Fig. 6 is a sectional plan of the gallery and burner. Fig. 7 is a plan view showing the attachment of the platinum wires to their support. Fig. 8 is an elevation of an atmospheric gas-tube having elongated air-inlets.

Referring to the drawings, the numeral 1 designates a tubular base or thimble, which, as shown, is internally screw-threaded for attachment to a gas-fixture. In the upper portion of this tubular base is inserted a horizontal perforated disk 2, through which the gas passes into an atmospheric gas-tube 3, that is supported in the upper end of said base. The atmospheric gas-tube 3 is provided near its lower end with a series of lateral air-inlets 4, which are preferably elongated in a vertical direction, as shown in Figs. 1 and 8.

The outer surface of the tubular base or thimble 1 is formed with a series of coarse spiral grooves or screw-threads 5, for engagement with a spiral nut or ring 6, that is supported in the lower portion of a bell-shaped shield 7, which carries in its upper end a tube or sleeve 8, that closely surrounds the atmospheric gas-tube. The greater portion of the sleeve 8 depends within the shield 7 a sufficient distance to entirely cover the elongated air-inlets 4 when the shield is adjusted to its lowest position. By vertically elongating these air-inlets, as shown, a greater range of

adjustment is obtained, whereby the relative proportions of air and gas can be regulated at will to produce the desired results, and the vertical elongation of the air-inlets enables a full supply of air to be obtained without unnecessarily weakening the atmospheric tube. The perforated disk 2 serves to divide the gas into fine currents and to maintain its full pressure very nearly to the point where it comes in contact with the air, thus producing a mixture of gas and air in such proportions and at such pressure as will give the best results in illumination by incandescence.

On the lower end of the bell-shaped shield 7 is formed an outwardly-flared rim 9, the periphery of which is preferably milled or roughened to enable it to be easily grasped for the purpose of rotating the shield either to the right or left, as required, thereby adjusting said shield 7 and its attached tube 8 in an upward or downward direction to open or close the air-inlets either wholly or partly, as may be desired. The flaring rim 9 of the bell-shaped shield 7 affords a support for a tube 10, which forms part of a combined burner and gallery.

In the upper end of the tube 10 is secured what I term an "air-crown" 11, which is formed with double annular walls that extend upward and outward above the tube 10, and then again upward, outward, and downward to form an annular air-chamber 12, that is open at the bottom, as shown in Figs. 1 and 5. On the lower outer rim of the air-crown 11 is formed or attached a chimney-gallery 13, having air-openings 14 in its horizontal portion, as shown in Figs. 1 and 6. The inner wall of the air-crown 11 is formed with an annular series of circular air-openings 15, and said wall is provided at a suitable distance below said openings with an internal annular shoulder 16 for supporting an Argand burner 17, that is preferably made from steatite, talc, or suitable non-conducting material.

The construction of the Argand burner is clearly shown in Figs. 1, 2, 3, and 4. It consists of a solid circular base, from which rise an outer annular wall 18 and an inner annular wall 19, thereby forming an annular open top-flame slot 20 and a central circular air-chamber 21, as shown. The outer and inner

walls of this burner are perforated horizontally beneath the annular flame-slot 20 by cylindrical air-channels 22, which lead into the central air-chamber 21, and the burner is
 5 so located in the air-crown 11 that the outer ends of these horizontal air-channels will register with the air-openings 15, that are formed in the inner wall of said crown. It will thus be seen that the central air-chamber 21 will
 10 receive a series of air-currents from the outer annular air-chamber 12, as shown in Fig. 1. The base of the burner is perforated near its periphery by an annular series of vertical gas-channels 23, which lead into the annular
 15 flame-slot. These gas-channels 23 alternate with the air-channels 22, as shown in Figs. 3 and 6, in such a manner that one series does not interfere with the other. The vertical gas-channels 23 are preferably of greater di-
 20 ameter than the width of the flame-slot, and are cored into the inner and outer walls of the burner to a height about half-way above the bottom of said flame-slot, and it will therefore be seen that they are capable of deliver-
 25 ing a sufficient supply of gas or gas and air mixture to the flame-slot in such a manner as to afford a free vent and enable the gas or mixture of gas and air to expand within and fill such slot up to the place of combustion,
 30 thereby maintaining a steady flame.

On the lower inner end of the air-crown 11, within the upper end of the tube 10, is an annular shoulder 24 for supporting a hemispherical wire-gauze or perforated diaphragm
 35 25, the apex of which is nearly in contact with the base of the burner 17, which thus serves to hold said diaphragm in place. This perforated or wire-gauze diaphragm effects a thorough division of the gas or gas and air
 40 mixture before it enters the flame-slot. Above and around the burner is suspended an incandescent device 26, which preferably consists of a net-work, hood, or cap of refractory material. This hood, cap, or incandescent
 45 frame-work is preferably suspended by a number of platinum wires 27, as shown in Fig. 7, from a horizontal ring 28 on the upper end of a rod 29, that is vertically adjustable in a lug 30, formed on one side of the air-
 50 crown or burner-support. By employing a number of platinum wires, as shown, an incandescent device of large size can be readily maintained in proper position with relation to the burner.

55 In an incandescent lamp of this character I prefer to employ a glass chimney 31 of the form shown in Fig. 1—that is to say, a chimney that is perfectly cylindrical for the greater part of its length and having an enlarged
 60 base portion that merges gradually into the upper portion by a single inclined or curved annular shoulder 32, without the usual contracted and internally-projecting neck that forms a double shoulder or incline. A chim-
 65 ney having a contracted internally-projecting neck is objectionable for use in connec-

tion with an incandescent hood or mantle by reason of the cooling effect produced by the concentration of air on the lower external
 70 portion of said mantle. This objection is entirely obviated by the form of chimney shown in the drawings, which permits an equable distribution of air on the outer surface of the mantle and promotes a uniform incandes-
 75 cence. This effect is further increased by the central air-supply introduced into the burner, which diverts the annular flame into more direct contact with the mantle, effects a thor-
 80 ough combustion of the gas without smoke or soot, and causes the mantle to glow with great power, thereby producing a brilliant and steady illumination with a moderate con-
 sumption of gas.

It will be observed that the entire lamp with its supporting-tube 10 rests loosely on
 85 the flaring rim of the bell-shaped shield 7, so that the lamp can be readily taken off and be replaced without disturbing the adjustment of the shield 7 and sleeve 8, whereby the mix-
 90 ture of air and gas is controlled, as before explained. The non-conducting burner 17 is preferably cemented or otherwise firmly secured in the air-crown 11, and the annular shoulder 16 serves as a stop or guide to facili-
 95 tate the placing of the burner at a proper depth in the crown to effect the registering of the air-openings in the respective parts, besides affording a reliable gas-tight joint. By forming the air-crown 11 with double walls,
 100 inclosing an annular air-chamber 12, that is open at the bottom, as shown, the outer wall of the crown serves to divide the external air-supply so that a portion passes through the chimney and is distributed over the exterior
 105 of the mantle, while another portion is drawn through the annular air-chamber 12 and passages 22 into the central air-chamber 21, and is thence distributed throughout the interior of the mantle, which otherwise would not receive
 110 a full air-supply.

In the practical use of the lamp an important advantage results from the facility with
 115 which it can be adjusted for use in the consumption of carbureted gas alone. Should the incandescent device become useless from any cause and no means be at hand for its
 replacement, it is only necessary to remove the disabled incandescent and close the air-
 120 inlets 4 of the atmospheric gas-tube, thereby supplying the Argand burner with carbureted gas only, and obtaining a gas-light of the best illuminating effect. With the incandescent attachment the lamp can of course be used
 125 with either carbureted or uncarbureted gas.

I would have it understood that I do not
 130 herein claim a gas-lamp comprising an atmospheric gas-tube, a vertically-adjustable bell-shaped shield normally supported on the base of said tube, and a vertically-adjustable burner-tube supported on the shield and movable therewith to cover or uncover the lateral
 135 air-inlets of the atmospheric gas-tube, as such

is described and claimed in another application, Serial No. 273,457, filed by me May 10, 1888.

Having thus described my invention, what I claim is—

1. In an incandescent gas-lamp, the combination, with a mantle, and an Argand burner having horizontal lateral air-inlets leading into a central air-chamber, of an air-crown surrounding and supporting said burner, and comprising an annular air-chamber open at the bottom and having its inner wall provided with air-openings that register with the horizontal lateral air-inlets of said burner, substantially as described.

2. In a gas-lamp, the combination, with the air-crown 11, having an annular air-chamber 12, provided with an annular series of openings 15, of the circular burner 17, having an-

nular flame-slot 20, central air-chamber 21, horizontal air-passages 22, and vertical gas-passages 23, substantially as described.

3. In a gas-lamp, the combination of the Argand burner 17, the air-crown 11, supporting said burner and formed with double walls inclosing an annular air-chamber 12, that communicates with the central air-chamber of the burner through horizontal air-passages, the gallery 13, having air-inlets 14, and a chimney supported on said gallery, substantially as described.

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

H. J. BELL.

Witnesses:

JAMES L. NORRIS,

JAMES A. RUTHERFORD.