

(No Model.)

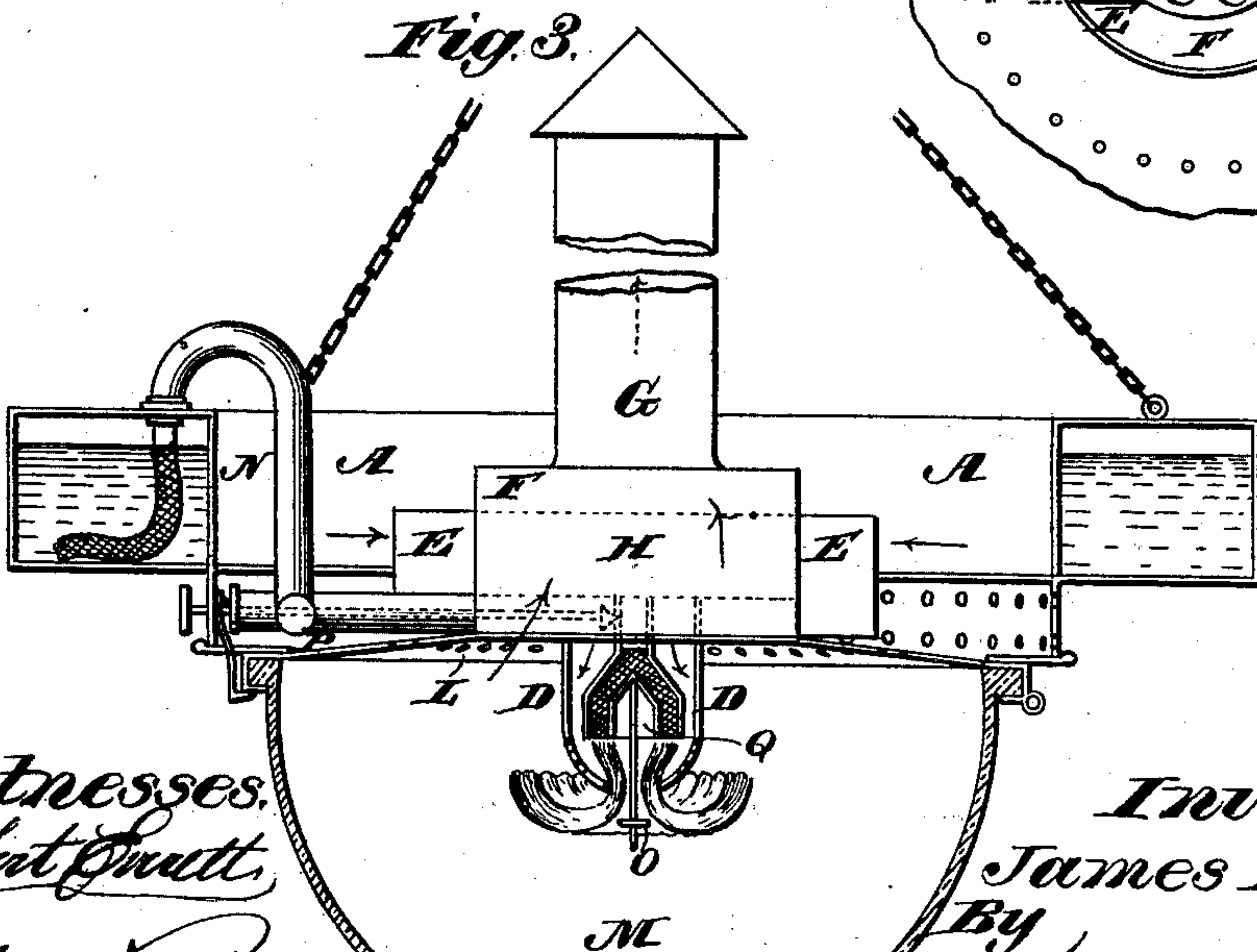
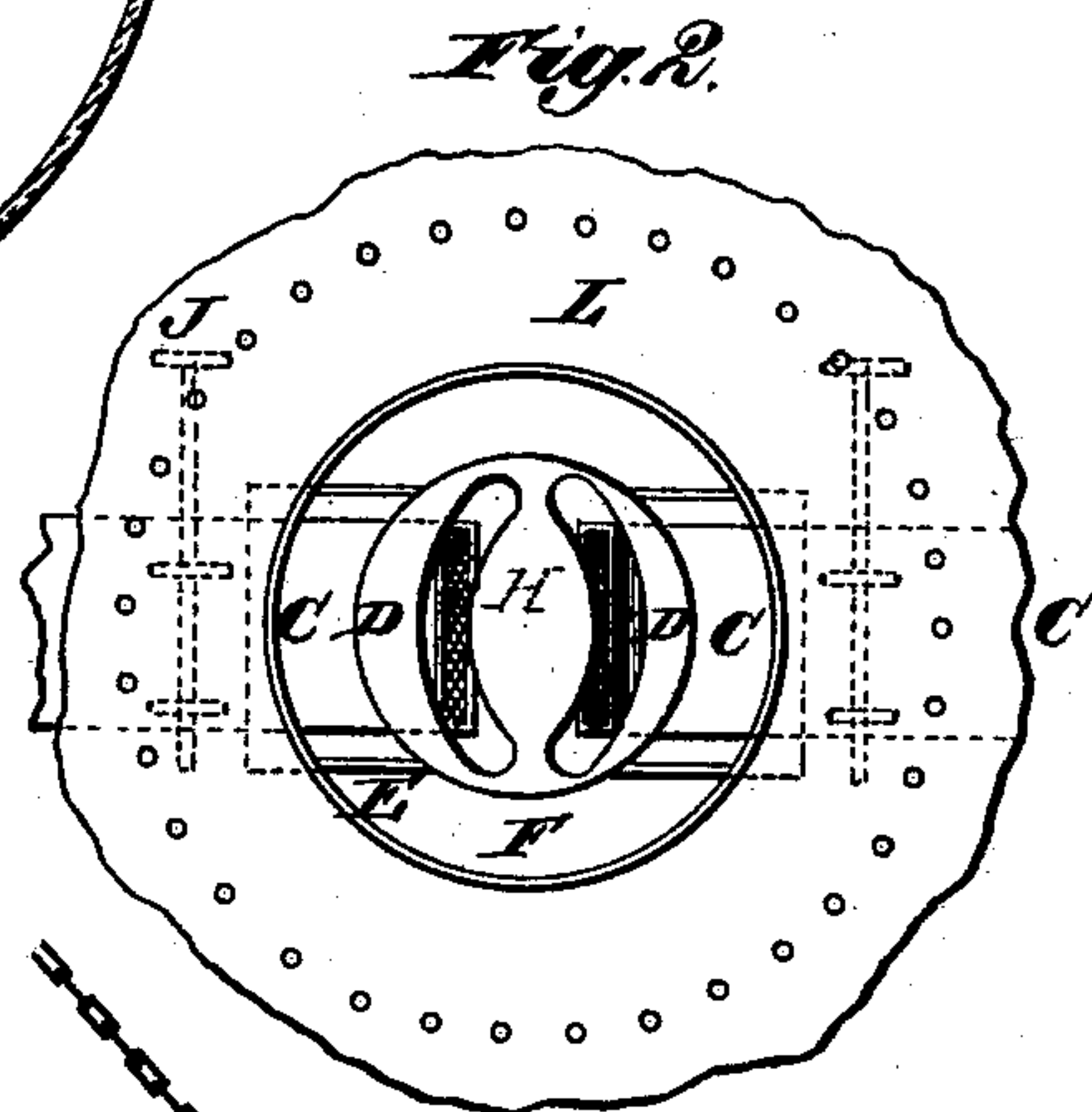
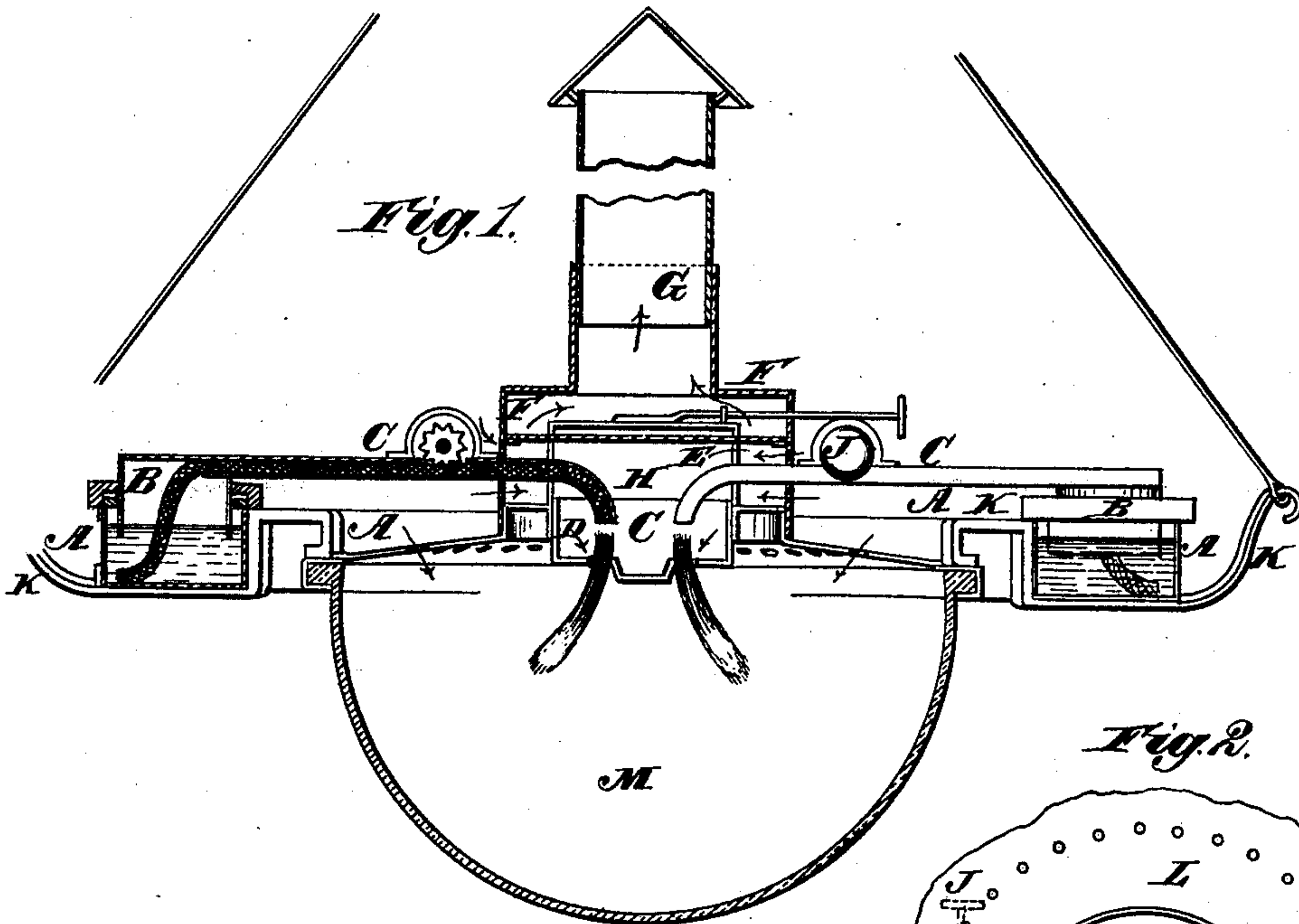
2 Sheets—Sheet 1.

J. ROOTS.

OIL LAMP.

No. 349,262.

Patented Sept. 14, 1886.



Witnesses,
Robert G. Pratt,

J. A. Rutherford,

Inventor
James Roots.

By
James L. Norring,
Atty.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 4.

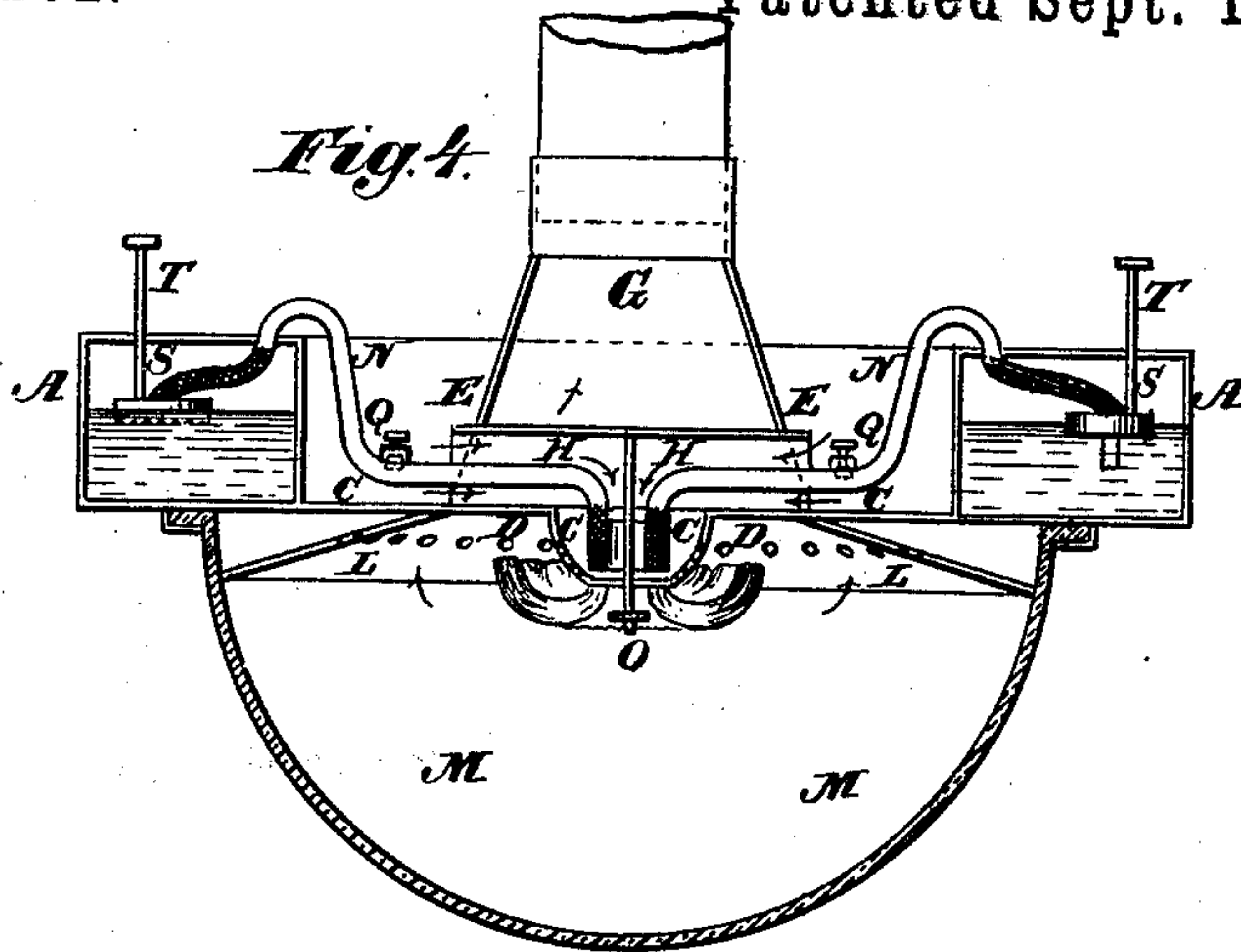


Fig. 5.

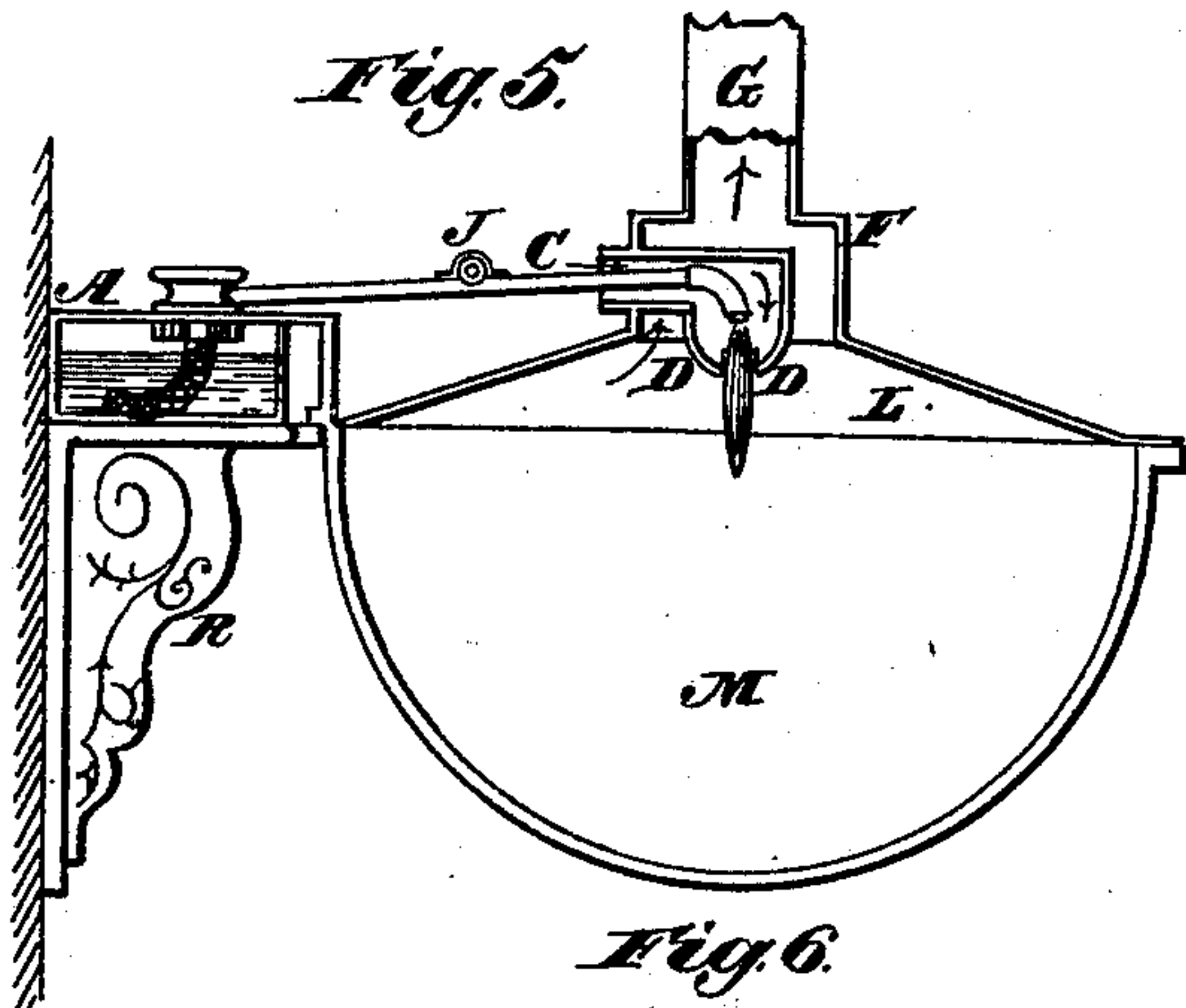


Fig. 6.

Fig. 7.

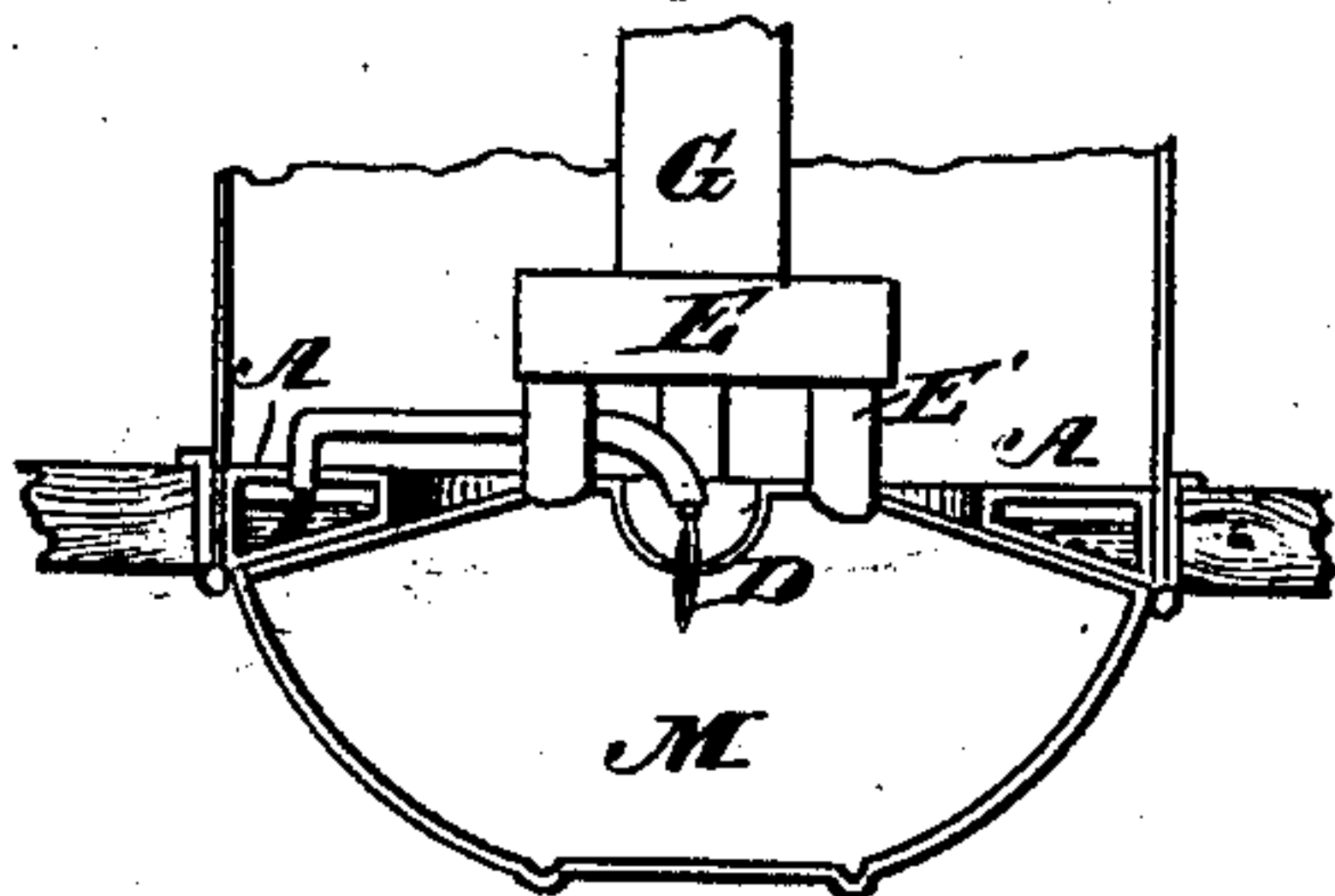
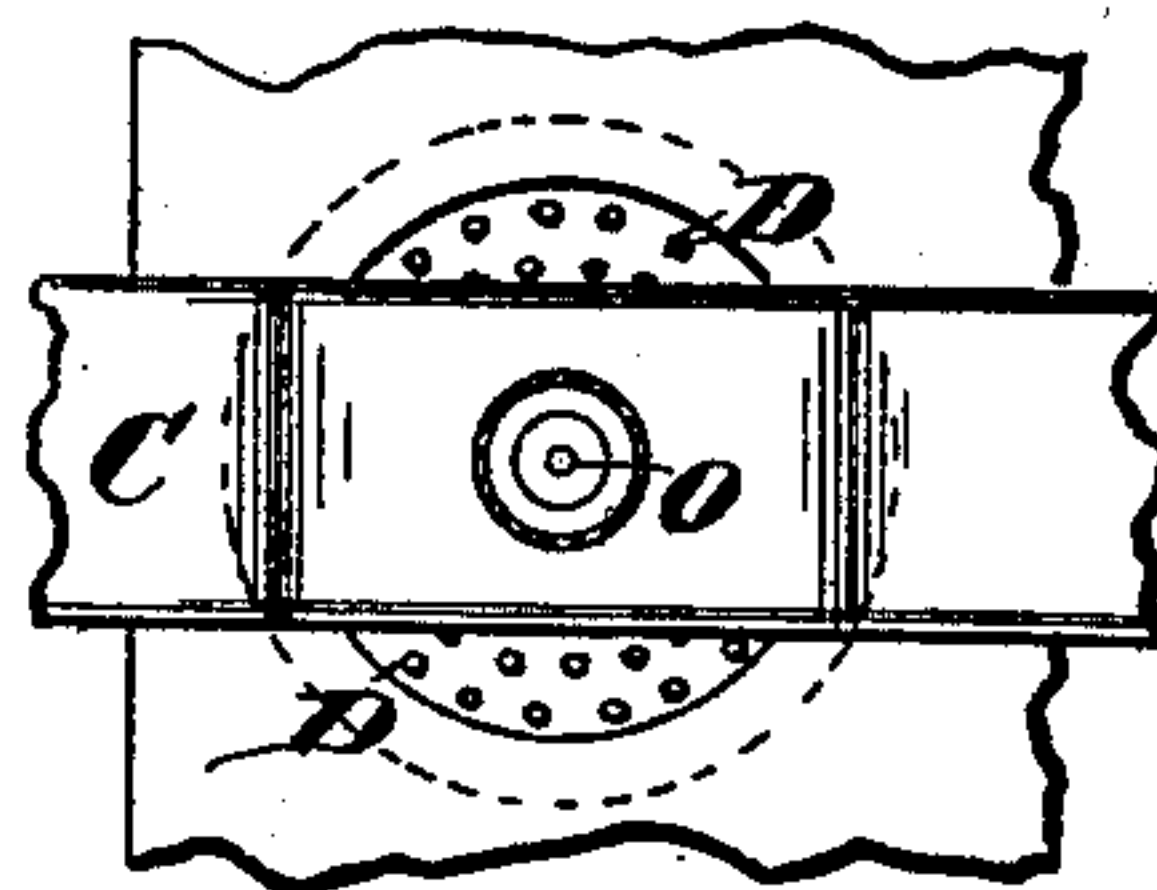


Fig. 8.



Witnesses,

Robert Everett,

J. A. Lutherford

Inventor,

James Roots,

By

James L. Norris,
Atty.

UNITED STATES PATENT OFFICE.

JAMES ROOTS, OF LONDON, ENGLAND.

OIL-LAMP.

SPECIFICATION forming part of Letters Patent No. 349,262, dated September 14, 1886.

Application filed April 5, 1886. Serial No. 197,866. (No model.) Patented in England March 16, 1885, No. 3,394; in France November 17, 1885, No. 172,325, and in Belgium December 15, 1885, No. 71,239.

To all whom it may concern:

Be it known that I, JAMES ROOTS, a subject of the Queen of Great Britain, residing at London, England, have invented new and useful Improvements in the Construction of Oil-Lamps, (for which I have obtained patents in the following countries: Great Britain, No. 3,394, bearing date March 16, 1885; France, No. 172,325, bearing date November 17, 1885, and in Belgium, No. 71,239, bearing date December 15, 1885,) of which the following is a specification.

The object of this invention is the construction of lamps that are designed to throw the light downward without a shadow, for by the peculiar construction of the lamp the flame is projected downward or downward and laterally by means of a downward current of heated air. The supply of oil from the reservoir, which is generally annular, in which case it surrounds the lamp, is conveyed laterally by means of wick casing or tubing to the burner, which is placed at or about the center of the lamp and projects downward. Various forms of burner may be used. The air-supply is admitted through perforations, passes along channels or a tube above the flame to the burner, descending with the flame, then, ascending, passes round and by the air channels or tube, and finally ascends the chimney in the center.

In the lamps for railway-carriage roofs the lamp has a suitable covering, to prevent the flame being affected by currents of air. Thus the outer air, passing through the tubes or channels and perforated metal so heated by the flame below it, and through the perforated metal within it, is continually gathering heat preparatory to its deflection upon the flame, after which it heats the incoming air in the air-channels. A reflector is used which may with the glass or globe form the flame-chamber. The cap or cone of the burner may be made with double wall, or with perforations, so that air may reach the flame after it has passed through the cap. The chimney may consist of one tube or channel or may be made of two or more tubes or channels terminating in one above the airway. To obtain greater durability, (for the wick does not last long under the great heat evolved,) I construct a burner

having within it layers or rolls of fine wire-gauze or perforated metal. The oil in its passage through the strata of gauze is heated and finely divided, as in a wick, and burns either from small perforations or directly from a surface of gauze. Where the burner is below the level of the oil or the reservoir, I use a tube, one end of which is above the level of the oil and the other below it. The tube carries a length of absorbent material which is partly in the oil and partly within the tube. The oil thus by capillary attraction ascends the absorbent material and descends it by gravitation, passing along the absorbent material, and reaches the burner in regular quantities, after the manner of a siphon-filter. The end of the absorbent material in the oil may be attached to a float, to better regulate the supply by keeping its end continuously at the same distance from the end of the tube. A cock with one, two, or more small perforations in it, or a screw-valve, may be used to further regulate the supply. Thus, whatever the level of the oil, the supply may be made regular and constant, and there is no leakage into the globe or glass. Plates of metal may be placed within the reservoir to prevent the rush of oil to one part when tilted, or, in the case of railway-carriages, when starting or stopping.

In the annexed drawings, Figure 1 is a sectional elevation of a duplex lamp embodying my invention. Fig. 2 is a plan of the burner and heating-chamber. Figs. 3 and 4 are sectional elevations of a lamp, illustrating certain modifications hereinafter referred to. Fig. 5 shows a bracket-lamp having only one wick. Fig. 6 illustrates the application of a single wick to a railway-carriage-roof lamp. Fig. 7 shows a single-wick lamp with the oil-reservoir inclosed therein. Fig. 8 is a bottom plan view of the burner, cap, and deflector.

In Fig. 1, A is an annular reservoir. B is a joint for the purpose of securely attaching the wick-cases to the reservoir. C is the wick case or burner; D, a cylindrical cap or covering of the burner, having two narrow curved perforations or slots in it, which are immediately below the ends of the wicks. E is the air-way channel or tube, through which the air passes from the exterior to the central or

heating chamber. F is the lower part of the chimney, fitting closely onto the reflector, forming a chamber containing the central heating-chamber and air-channels thereto. G is the chimney. H is the central or air-heating chamber. I is a trap or slide valve, which is opened on first lighting the lamp to create a draft. J is a toothed wheel or pinion for the purpose of regulating the light. K is the frame attaching the central parts of the lamp to the chain or suspender. L is the reflector. M is the glass or globe. The oil-supply passes along the wick-case C to the burner. On lighting the lamp the flames ascend through the tap or valve I, which is opened, causing a current of air up the chimney G. I is then closed, when the flames immediately turn downward and burn through the apertures or slots in D. The air to supply the flame passes, as the arrows indicate, through perforations at the entrance of the air ways or channels E into the central chamber, H. It then passes with the flame through the apertures in D, the force of the current projecting the flames downward into the globe or glass M. The heated air, with the products of combustion, then ascends into F, passing round and by the central chamber, H, and its air-channels E, heating them in its passage to the chimney G. Thus the heated ascending outgoing air in F is made to heat the incoming air in E and H, producing a more perfect combustion and an intenser light. The light is, moreover, a downward light, throwing its rays downward without a shadow. Air may also be admitted to the lamp, through perforations in the reflector L, with the object of checking the conduction of heat to the glass or globe M.

Fig. 2 is a plan of the burner and heating chamber in Fig. 1, in which the same letters apply to the same details of construction. This lamp is provided with two flat wicks; but by placing three or four wicks close together or at equal distances, the flame will be circular, or nearly so. There may be any number of wicks to the burner. The wicks may be of asbestos or of the ordinary material.

Fig. 3 shows another form of suspended lamp, in which the burner is below the level of the reservoir, and the supply of oil to the burner C is by the tube N, carrying a length of capillary absorbent material, which is continued in the tube P. Q is a screw cock or valve for the purpose of regulating the supply of oil to the burner C, which is annular. The air enters at the sides E to the heating-chamber H, passes down the inverted cap D, down the sides of and through the center of the burner C, supplying the flame. The burner C is packed with fine wire-gauze, and the flame proceeds from the surface of gauze. The air that passes through the center of the burner, impinging on the deflector or button O, spreads the flame laterally outward, as shown. The products of combustion then heating the air-ways E and central chamber, H, ascends the chamber F and chimney

G. The chamber F may be formed of two or more tubes, E' E', (see Fig. 7,) to convey the products of combustion to the chimney G in either form of lamp.

In Fig. 4 also the burner is below the level of the reservoir, and the oil is conveyed downward to the burner by two or more wicks within tubes or casing to the burner C, which is annular, and the button O deflects the flame laterally, as in Fig. 2. Q is the screw cock or valve regulating the supply. S are floats attached to the wick ends and pivoted on the ends of the tubes N, for the purpose of keeping the wick ends at the same distance from the tube ends, whatever the level of the oil, and thus better regulating the supply than siphons over to the burner by capillary attraction. T are connecting-wires (which may be attached to floats S) for the purpose of lifting them at will from the oil to stop the supply to the burner. This arrangement of circular burner formed of two or more wicks may be equally well applied in a lamp with the burner above the reservoir, although shown below.

Fig. 5 shows a bracket-lamp having only one wick, in which the heating-chamber H has but one air-channel E. The reservoir rests on the bracket R, from which arms project to support the lamp. In a modification of the single air-way it projects by tubing from the reflector into the globe M. The cap or cone is at the lower end of the air-tube, and projects the flame more laterally. The burner is below the reservoir, and is supplied by siphonage, as described.

Fig. 6 shows the application of the single-wick form of my invention to a railway-carriage-roof lamp, although either of them may be equally well applied to this purpose, and the reservoir A may be placed either outside the lamp or inside the lamp, as shown at Fig. 7.

Fig. 8 shows a bottom plan view of burner, cap, and deflector. It will be observed that the flame or flames, whether from the wick or gauze burner lamp, always burns downward by means of the downward current of heated air obtained by the described construction.

The lamps are applicable for every purpose for which ordinary lamps are used, but particularly for railway-carriage-roof lamps, and either of the lamps described is applicable for this purpose.

What I claim, and desire to secure by Letters Patent, is—

1. In a lamp, the combination of the oil-reservoir, the depending burner, the wick-tube, the globe, the annular reflector surrounding the burner, the heating-chamber H, and the chimney, substantially as described.

2. In a lamp, the combination, with an oil-reservoir, a globe, a chimney, and an annular reflector, of a downwardly-turned wick-tube and a depending burner, said burner being surrounded by the globe and annular reflector, whereby the flame is projected downward and a shadow avoided, substantially as described.

3. In a lamp, the combination, with an oil-reservoir, a globe, a chimney, and an annular reflector, of a wick-tube, a depending burner, and a deflector located beneath said burner, whereby the flame is projected downward and laterally, substantially as described.

4. In a lamp, the combination of an oil-reservoir, a wick-tube, a burner depending beneath the level of the oil-reservoir, a globe, an annular reflector perforated for the passage of air, a central heating-chamber, an air-inlet chamber, and a chimney, substantially as described.

5. In a lamp, the combination of an oil-reservoir, a downwardly-turned wick-tube, a circular depending burner, a globe, an annular reflector surrounding the burner, and a chimney, substantially as described.

6. In an oil-lamp, the combination of an oil-reservoir, a wick-tube, a depending burner, an annular air-inlet chamber, and a central heating-chamber located above the burner, an annular reflector surrounding the burner, a globe, and a chimney, substantially as described.

7. In a lamp, the combination of an oil-reservoir, a depending burner, a globe, and an annular reflector surrounding said burner, a wick-tube through which the oil ascends from the reservoir and descends to the burner, and

means for regulating the oil-supply, substantially as described.

8. In a lamp, the combination of an oil-reservoir, a downwardly-turned wick-tube, a depending burner, an annular reflector surrounding said burner, a globe, a chimney, an air-inlet chamber, and a central valved heating-chamber located above the burner, substantially as described.

9. In a lamp, the combination of an annular oil-reservoir, a wick-tube, a depending burner, the cap D, central heating-chamber, H, air-inlet chamber E, an annular reflector perforated for the passage of air, a globe, and a chimney, substantially as described.

10. In a lamp, the combination, with the oil-reservoir, burner, wick-tube, and wick, of a float attached to said wick and provided with means for raising it above the level of the oil in the reservoir, substantially as described.

In witness whereof I have hereto signed my name in the presence of two subscribing witnesses.

JAMES ROOTS.

Witnesses:

E. M. RIDGWAY, *Spinster*,

TOB. G. RIDGWAY, *Notary Public*,

Both of 19 Change Alley, E. C., London, England.