

(No Model.)

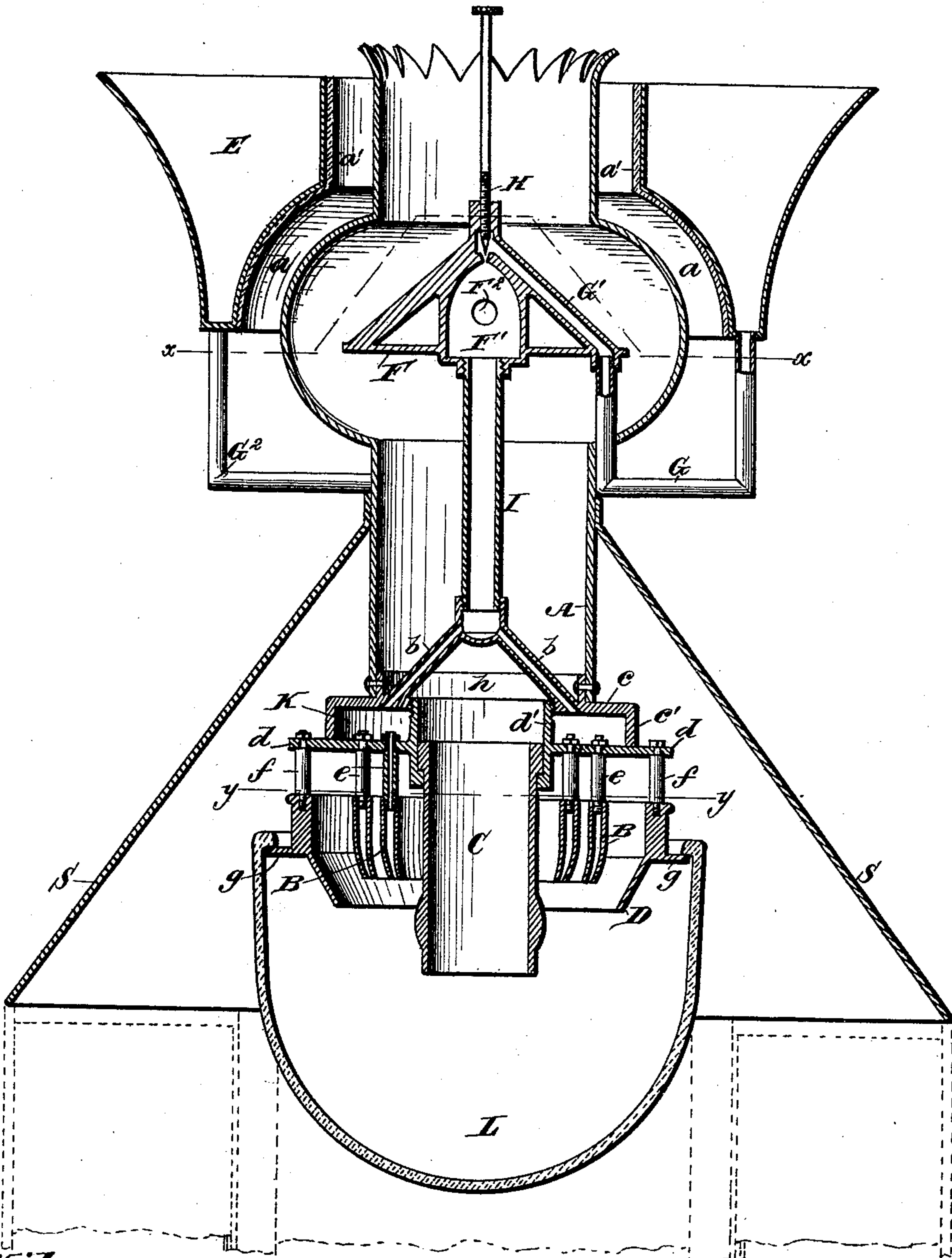
2 Sheets—Sheet 1.

A. J. ENGLISH.  
REGENERATIVE LAMP.

No. 489,582.

Patented Jan. 10, 1893.

*Fig. 1.*



Witnesses.  
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*J. A. Rutherford*

Inventor.  
*Andrew J. English*  
By *K. M. Horea* *Atty.*

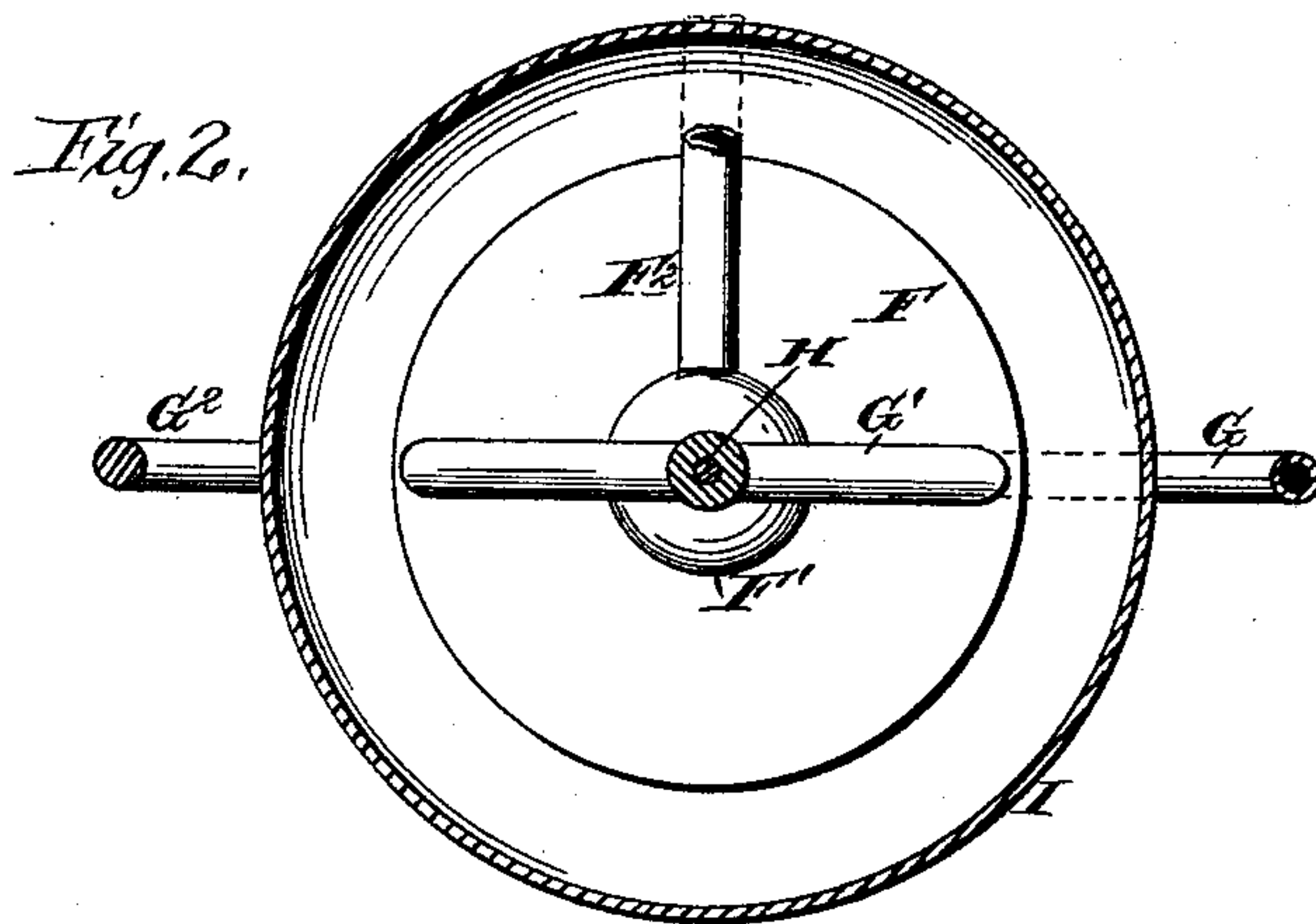
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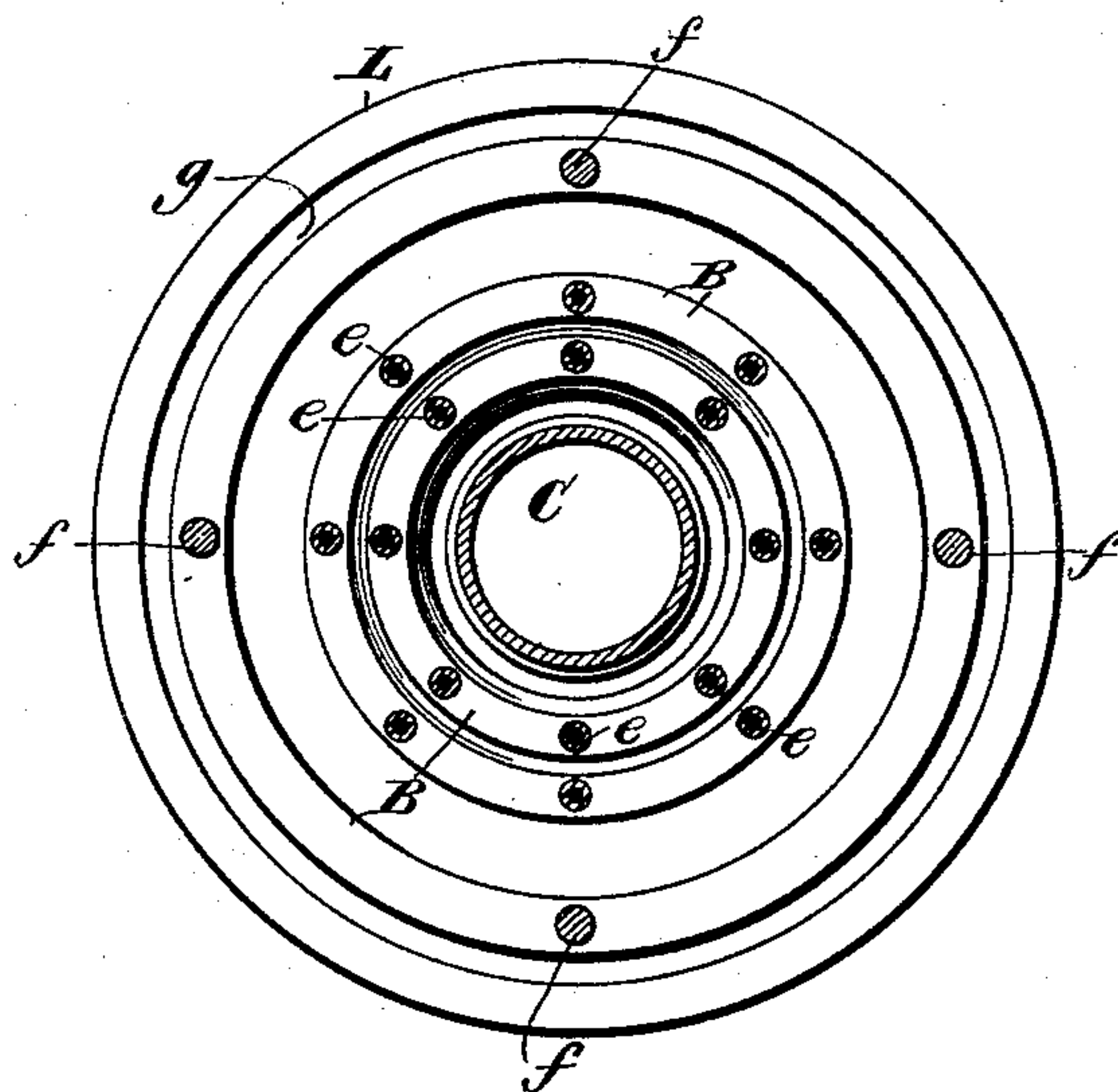
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*Fig. 3.*



Witnesses:  
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Inventor:  
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*K. M. Torrey* Atty.



# UNITED STATES PATENT OFFICE.

ANDREW J. ENGLISH, OF CINCINNATI, OHIO.

## REGENERATIVE LAMP.

SPECIFICATION forming part of Letters Patent No. 489,582, dated January 10, 1893.

Application filed April 19, 1889. Renewed June 9, 1892. Serial No. 436,088. (No model.)

*To all whom it may concern:*

Be it known that I, ANDREW J. ENGLISH, a citizen of the United States, residing at Cincinnati, Hamilton county, Ohio, have invented  
5 new and useful Improvements in Regenerative Lamps, of which the following is a specification.

My invention relates to "regenerative" lamps; its object being to produce a hydro-carbon vaporizing lamp in which the burner is arranged to feed downward carrying the flame around a "regenerator" or refractory flame deflector constituting the throat of a chimney through which the waste gases of  
15 combustion are carried upward by natural levitation and utilized to vaporize the hydro-carbon.

The general object of my invention is to produce a self contained hydrocarbon lamp  
20 embodying those regenerative features which have been found so useful in connection with the ordinary gas, and which, so far as I am aware, have not been applied in this manner to hydro-carbon vaporizing lamps in order to  
25 furnish a powerful lamp for use more particularly in outlying streets or districts, or in situations where ordinary gas may not be conveniently accessible.

To this end my invention consists in the  
30 lamp embodying, in combination, a hydrocarbon reservoir; a vaporizing retort; burner; and flame and air-deflectors; constructed and arranged as hereinafter more particularly set forth; and in details of construction rendering the lamp economical in construction and  
35 effective in operation.

My invention is illustrated in the accompanying drawings in which:

Figure 1, is a general axial section of the  
40 lamp complete: and Fig. 2, is a section taken on line  $x-x$ , and Fig. 3 a section taken on the line  $y-y$ , of Fig. 1.

Referring now to the drawings, A, designates a chimney of sheet metal, B, B, annular  
45 burners, (of which there may be one or two—two being here shown) C the refractory flame deflector constituting the throat or lower terminus of the chimney A, and, D, the exterior air-deflector—these parts being the  
50 principal features of an ordinary gas lamp of the "regenerative" class of an approved type in common use. These parts I construct in

detail, and combine with them certain other elements as hereinafter set forth to constitute a self contained regenerative vaporizing lamp  
55 generating its own vapor.

The reservoir for the hydro-carbon liquid may be located and arranged in any convenient relation to the lamp: but I prefer to construct it as an annular cap or head, E, attached  
60 to and surrounding the chimney, A, symmetrically, leaving an air space,  $a$ , between to prevent overheating, and with such additional protection, such for example, as an asbestos lining,  $a'$ , as may be necessary. Just below  
65 the reservoir, E, the chimney is preferably enlarged to admit the usual vaporizing shield, F, and retort, G', of the gasoline feed pipe, G—the latter being bent into depressed, U-form to constitute a "stand-pipe" for the gas-  
70 oline under the back pressure of the gas formed in the retort. The usual needle valve, H, is provided.

The U-tube connecting the reservoir and retort, constitutes one of the supports of the  
75 reservoir and may be duplicated as a support by a bent rod, C<sup>2</sup>, at the opposite side similarly arranged for symmetry. Gas exit of the retort, G', terminates at a chamber, F', directly over the vertical gas tube, I, which ex-  
80 tends centrally down through the chimney and ramifies into branches,  $b$ ,  $b$ , (two or more) suspending and feeding the vaporized hydro-carbon to the annular burner or burners, B, one or more air tubes, F<sup>2</sup>, extend out-  
85 ward through the chimney, A, from the chamber, F', in such relation to the downward path of the gas discharged through the chamber as to "siphon" in the air required to mix  
90 with the hydro carbon vapor and the tube or tubes may be provided exteriorly with any suitable regulating device to adjust the quantity of air to the requirements of the lamp.

The preferred construction of the lower part of the lamp is as follows: The arms,  $b$ ,  
95 terminates below in an annular plate,  $c$ , provided with a down projecting flange,  $c'$ , the inner opening of the plate being screw threaded for the reception of the upward projecting flange,  $d'$ , of an annular plate,  $d$ . These  
100 two plates with their flanges when placed together constitute an annular chamber, K, entered and supplied above by the branch pipes,  $b$ . From the plate,  $d$ , constituting the lower



wall of the chamber, K, the annular burner or burners, B, are suspended by the supply tubes, *e*, arranged concentrically. A convenient mode of construction is shown in which the tubes, *e*, are screwed into the upper part of the burners and are shouldered above with their necks projected through the plate, *d*, and secured by nuts at the opposite side of the plate. The flange, *d'*, of the plate, *d*, extends downward and is provided with an inner shoulder upon which is secured the cylindrical refractory deflector, C, projecting downward within the burner or burners, B. From the outer edge of the plate, *d*, by suitable short rods—*f*—is suspended the air deflector, D, and this in turn is provided with an outer ledge, *g*, from which is suspended the glass semi-globe, L. At the upper side of the plate, *c*, is a flange, *h*, to which the chimney, A, is attached. The arrangement of these parts in respect to air spaces between the refractory deflector and burner and between the burner and outer air deflector is the usual one—the air passing inward beneath the plate, *d*, and between the suspending rods, *f*, and, *e*.

For out of door use, owing to the great heat generated by the lamp and the danger of breakage of the semi-globe, L, from rain or other accidental causes, I may attach to the chimney, A, a conical shade, S, constituting a protecting roof and light deflector, and may attach to it depending from its lower outer edge a frame or cage in which panes of glass may be inserted.

As thus constructed the entire lamp and reservoir may be suspended from a ceiling or bracket by a bail.

The operation of the device may be recapitulated as follows: Hydro carbon liquid fed from the reservoir, E, (wherein situated) at proper height is allowed to flow through pipe, G. The lower glass globe, L, being temporarily removed and an alcohol torch or other means of heating being applied from below, and the plate, F, and retort, G', being heated, the hydrocarbon liquid is vaporized; and, flowing downward through the central pipe, I, and through the burner or burners, B, is discharged below and lighted. The flame plays downward around and into the flame deflector, C, which forms the entrance throat of the chimney A. The waste gases and heated air of combustion play around the plate and retort and maintain the constant vaporization of the liquid hydrocarbon. The jet in playing downward through the air chamber, F', acts by siphonage to draw in a supply of air through the tube or tubes, F<sup>2</sup>, which is heated and mingled with the hydrocarbon vapor, and both together superheated

in the tubes I, *b*, *b*, and delivered thus superheated to the burner. The chamber, K, serves also to delay the passage of the mixed air and vapor for further heating, and also to equalize the distribution to the several pendent supply tubes, *e*, of the burner or burners. The air for combustion passes down beneath the plate, *d*, and is superheated by contact with the deflector, C.

I claim as my invention and desire to secure by Letters Patent of the United States:

1. In a regenerative lamp of the character described, the combination with the inverted burner, and an uptake chimney, of a vaporizing retort located within the chimney above the burner, and having an air inlet opening, and a hydrocarbon reservoir communicating with said retort, substantially as described.

2. In a regenerative lamp, the combination of an annular inverted burner, a refractory deflector located within the burner, an uptake chimney, a vaporizing retort located in said chimney above the burner, a hydrocarbon reservoir, and pipe connections between the retort and burner, substantially as described.

3. In a vaporizing lamp, the combination of an annular depending burner, an uptake chimney, a vaporizing retort located in said chimney above the burner and having an air-inlet opening and an equalizing supply chamber from which the burner is suspended, said chamber being connected with the retort, substantially as described.

4. The combination and arrangement in a regenerative lamp of the character described, of the annular reservoir, E, chimney, A, retort, G', supply pipe, G, and their immediate attachments with the supply pipe, I, and connected parts constituting the lamp proper, substantially as set forth.

5. The combination with the annular burner, a cylindrical deflector C projecting downward within the burner, an annular gas chamber K from which the burner is suspended and an uptake chimney communicating with the cylindrical deflector, of the reservoir E surrounding the upper part of the chimney, the shield F located in the chimney and provided with retort G' gas chamber F' and valve H, the pipe G connecting the reservoir and retort, and the pipe I connecting the gas chambers F' and K, substantially as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ANDREW J. ENGLISH.

Witnesses:

L. M. HOSEA,  
ELLA HOSEA.