

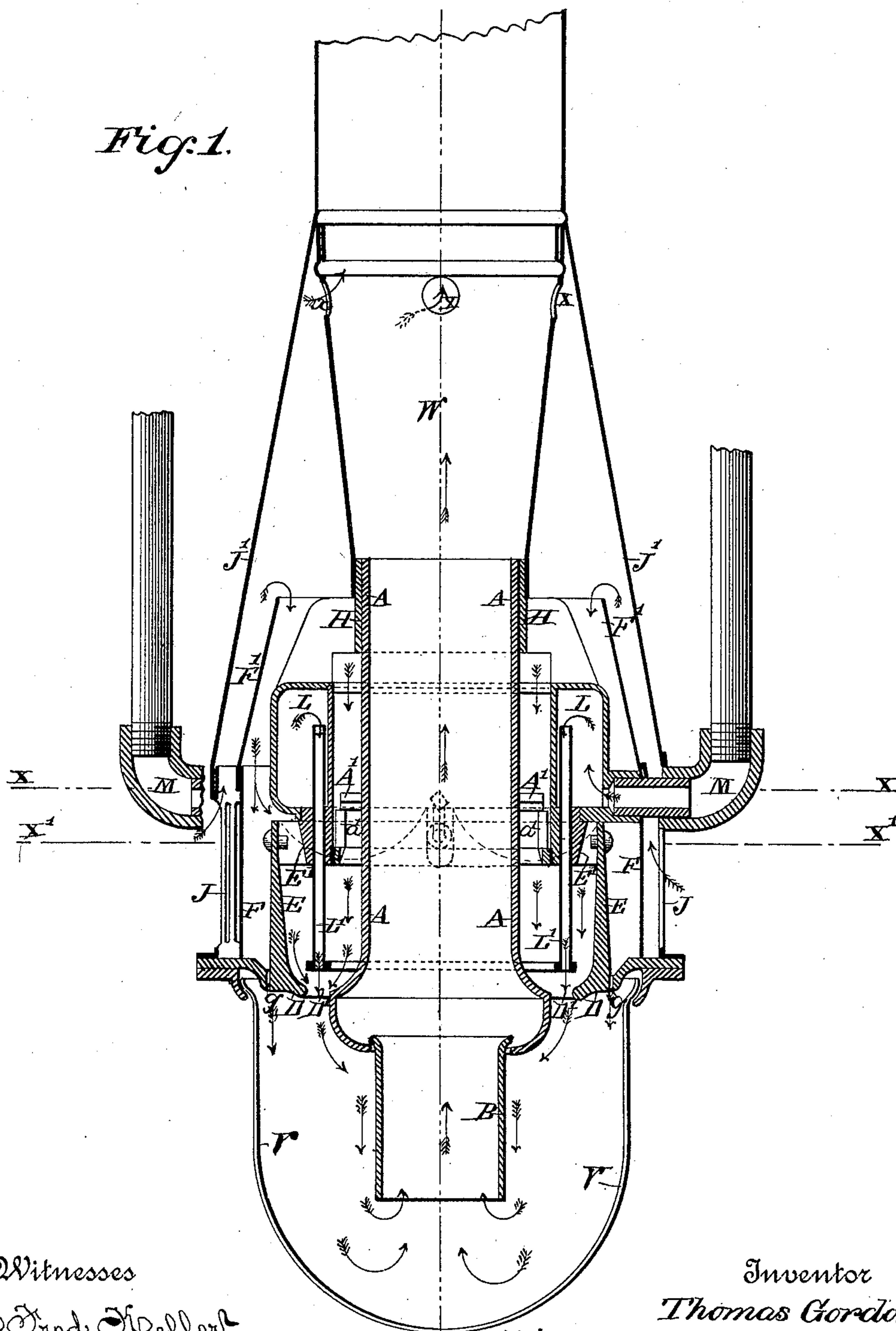
(No Model.)

2 Sheets—Sheet 1.

T. GORDON.
REGENERATIVE GAS BURNER.

No. 432,399.

Patented July 15, 1890.



Witnesses
O. Fred. Wallard.
Vernon M. Horsey.

Inventor
Thomas Gordon
By his Attorney
C. S. Whitman

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Fig. 2.

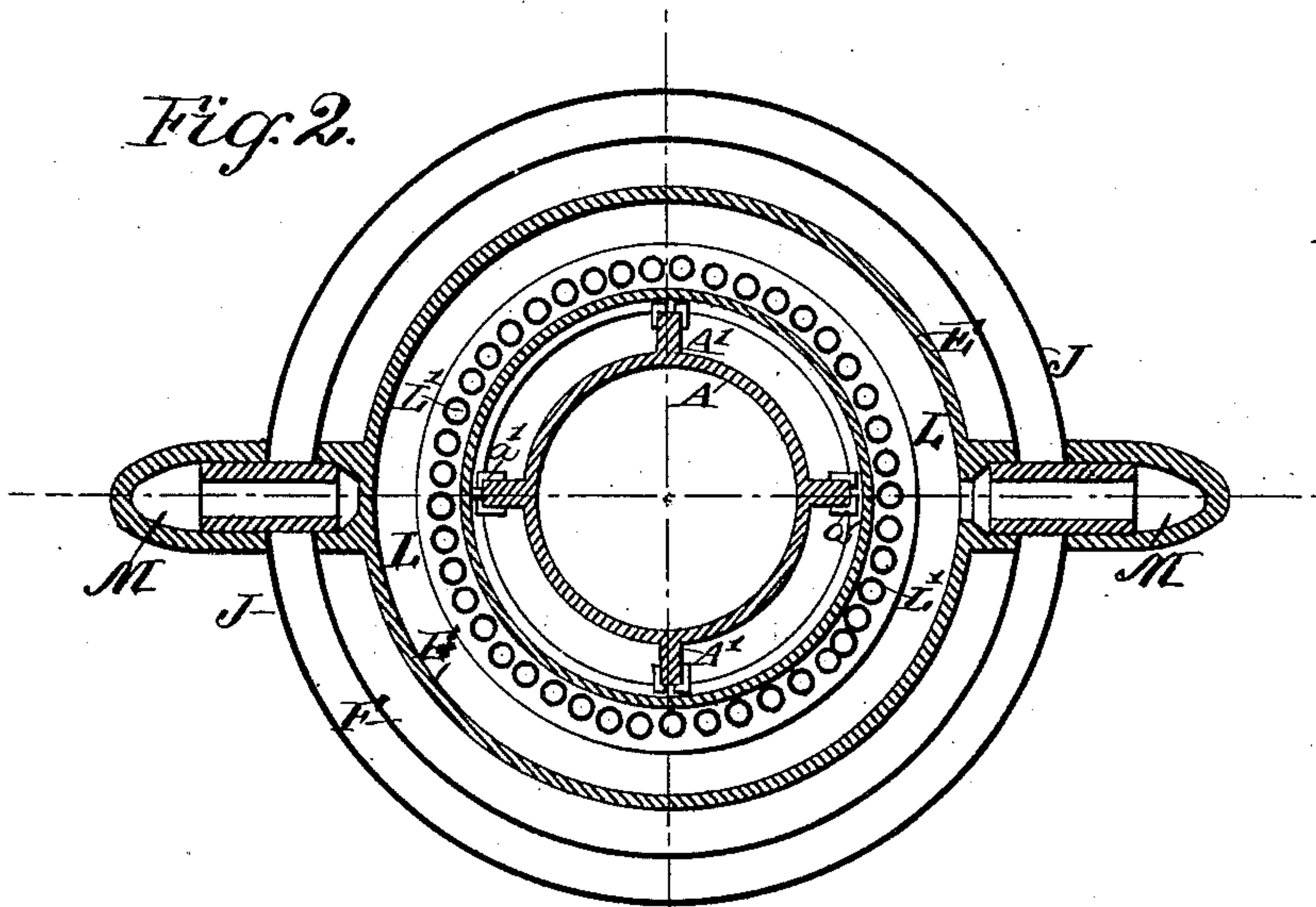


Fig. 3.

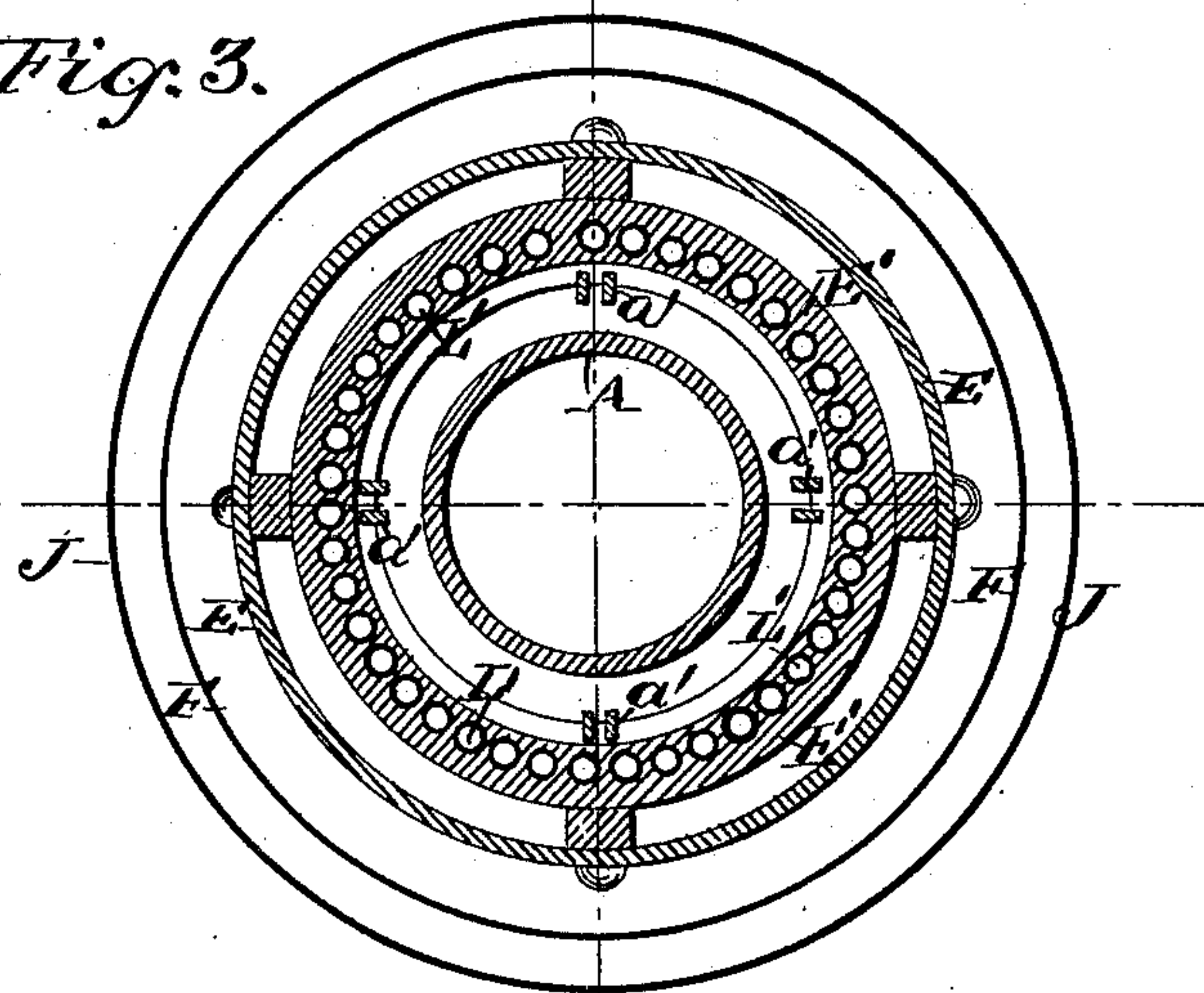
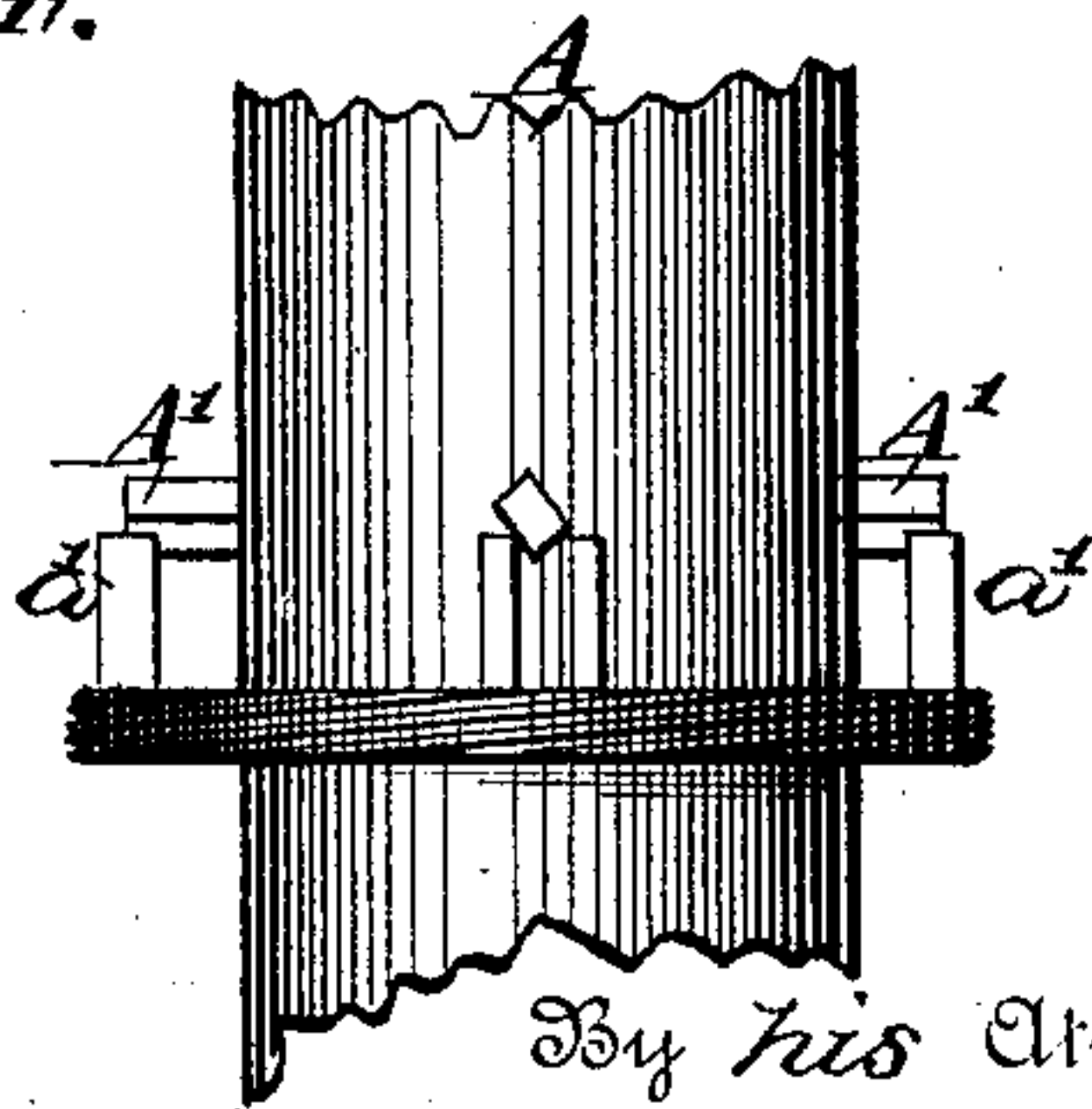


Fig. 4.



Witnesses
O. Fred. Keller
Vernon M. Worsey

Inventor
Thomas Gordon
By his Attorney
C. S. Whitman

UNITED STATES PATENT OFFICE.

THOMAS GORDON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE SIEMENS-LUNGREN COMPANY, OF PENNSYLVANIA.

REGENERATIVE GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 432,399, dated July 15, 1890.

Application filed November 1, 1886. Serial No. 217,717. (No model.)

To all whom it may concern:

Be it known that I, THOMAS GORDON, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Regenerative Gas-Burners; and I do hereby declare the following to be a clear, full, 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.

My invention relates to that class of regenerative burners for which Letters Patent of the United States No. 345,499 were granted to me on the 13th day of July, 1886; and the nature thereof consists in certain modifications in the details of the construction of the said burners and improvements thereon, which will be hereinafter described and claimed.

An important feature of my invention consists in the means made use of for protecting the upper ends of the burner-tubes. These tubes convey the gas immediately to the burner-tips, and it is important to prevent the entrance of extraneous particles thereto, and also to secure a deposit of the impurities with which the gas may be charged before they reach the upper mouths of the tubes. In order to effect this result, the upper ends of the gas-tubes are constructed of sufficient length to project above the flanged ring which forms the floor of the gas-chamber.

In the accompanying drawings, in which corresponding parts are designated by similar letters, Figure 1 is a vertical section. Fig. 2 is a horizontal section on the line $x x$ of Fig. 1. Fig. 3 is a horizontal section on the line $x' x'$ of Fig. 1, and Fig. 4 illustrates the method of supporting the central flue.

In the drawings, A represents the central passage or flue, which may be connected with the lamp in any suitable manner, provided it is so combined therewith as to be readily detached and removed. One of the methods which I have used for attaching and detaching the central flue is best illustrated in Fig. 4, in which a designates a ring provided with a thread upon its outer periphery, by which it may be secured to the burner, as shown in

Fig. 1. This ring is provided with a number of supports a' for the projecting lugs A' , attached to the removable tubular chamber A, by means of which construction it is obvious that the latter may readily be detached by lifting it from its bearings.

At the lower end of the chamber A is the removable cylinder B, of refractory material, having an annular projection at its top, which rests upon the inwardly-projecting lower edge of the chamber A, so that it may be readily detached, when the latter is removed from the lamp, by carrying it up through the flue and out of its upper end, for which purpose the greatest diameter of the cylinder B is less than the smallest diameter of the flue. Around the lower end of the flue A is arranged the base-plate D, from which rise the shells E and F, the outer perforated cylinder J, the cone-shell F' , and the hood J' , all of which encircle the flue A. The annular gas-chamber L is located between the shell F and flue A, and the shell E is supported by being fastened to lugs or bosses E' of the gas-chamber L. The tubes L' of the burner extend for some distance upward into the gas-chamber L, and the lower ends thereof are located just above the annular opening D' in the base-plate D. The upper ends of the gas-tubes L' are constructed of a sufficient length to project above the ring E' , in which they are secured, which ring forms the floor of the gas-chamber L. The gas is carried downward to the said floor by the pipes M. The flue W, formed in the shape of an inverted conical frustum, rises from the flue A, and its lower end encircles the collar H and makes an air-tight joint therewith, while its upper part makes an air-tight joint with the hood J' . Just below the point where the flue W meets the hood J' perforations x are made in the former for the passage of a limited portion of the heated air and products of combustion from the burner.

Other features of construction will be found described in the patent No. 345,199, granted to me July 13, 1886.

When the lamp is burning normally, gas enters the chamber L through the pipes M,

and from thence passes downward through the series of tubes L' to the flame, while the air to support combustion enters through the perforations in the cylinder J, passes upward between the hood J' and shell F, and thence principally downward, as indicated by the arrows around the gas-chamber L and burner-tubes L', to the flame. A small portion of the air, however, will pass upward through the holes *x* to the chimney, and another small column will pass downward between the casings E and F and through the perforations *g* in the base-plate. When the gas is first lighted at the tips of the burner-tubes L', the globe is closed and the products of combustion from the flame will at first rise and pass through the perforations *x* into the flue W, which will induce an upward draft in the latter greater than the openings *x* can supply, and a suction will be produced in the flue A which will cause the flame to turn down into the globe V and envelop the base of the flue A. The products of combustion will then pass upward through the flues A and W, imparting heat to the walls thereof. Air will then enter through the perforations in the cylinder J, and the perforations *x*, not being of sufficient area to allow of all the air escaping through them, the greater part will circulate through the downward passages to the burner and globe, as shown by the arrows.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. In a regenerative gas-burner, the combination of the casing W, provided with openings through which a portion of the heated air and products of combustion pass to the chimney, the chimney situated above the said ports, a central removable passage A, provided with lugs A', and the supports *a'* for the said lugs.

2. A gas-burner having a removable central passage or flue A, a ring provided with threads upon its outer periphery by which it may be secured to the burner, lugs A', attached to the removable passage or chambers, and supports *a'*, attached to the said ring for the support of the lugs, as and for the purpose described.

3. A gas-burner having a removable central chamber A, a ring provided with threads upon its outer periphery, and supports *a'*, lugs A', attached to the removable passage or chamber, a removable cylinder B, of refractory mate-

rial, a base-plate D, shells E and F, rising from the base-plate, and an outer perforated cylinder J, all combined as and for the purpose described.

4. A gas-burner having a removable central chamber A, a ring provided with threads upon its outer periphery, and supports *a'*, lugs A', attached to the removable passage or chamber, a removable cylinder B, of refractory material, a base-plate D, shells E and F, rising from the base-plate, an outer perforated cylinder J, a cone-shell F', and hood J', all combined as and for the purpose described.

5. A gas-burner having a removable central chamber A, a ring provided with threads upon its outer periphery, and supports *a'*, lugs A', attached to the removable passage or chamber, a removable cylinder B, of refractory material, a base-plate D, shells E and F, rising from the base-plate, an outer perforated cylinder J, an annular gas-chamber L, and a shell E, all combined as and for the purpose described.

6. A gas-burner having a removable central chamber A, a ring provided with threads upon its outer periphery, and supports *a'*, lugs A', attached to the removable passage or chamber, a removable cylinder B, of refractory material, a base-plate D, shells E and F, rising from the base-plate, an outer perforated cylinder J, an annular gas-chamber L, and tubes L', extending upward into the gas-chamber and having their lower ends located just above the openings in the base-plate, all combined as and for the purpose described.

7. A regenerative burner having an annular gas-chamber L, tubes L', extending upward into the gas-chamber, and a shell E.

8. In a regenerative gas-lamp, the combination of a gas-chamber into which the gas flows from the supply-pipe, a series of tubes conveying the gas from the gas-chamber downward to the burner-tips, having their upper ends projecting up into the gas-chamber above the orifice through which the gas enters the chamber, and gas-supply pipes entering the chamber below the plane of the tops of the said tubes, as and for the purposes described.

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

THOS. GORDON.

Witnesses:

FRANCIS S. BROWN,
HENRY A. MCMURROW.