

No. 786,300.

PATENTED APR. 4, 1905.

E. LABERGE.
GAS HEATER.

APPLICATION FILED DEC. 5, 1904.

2 SHEETS—SHEET 1.

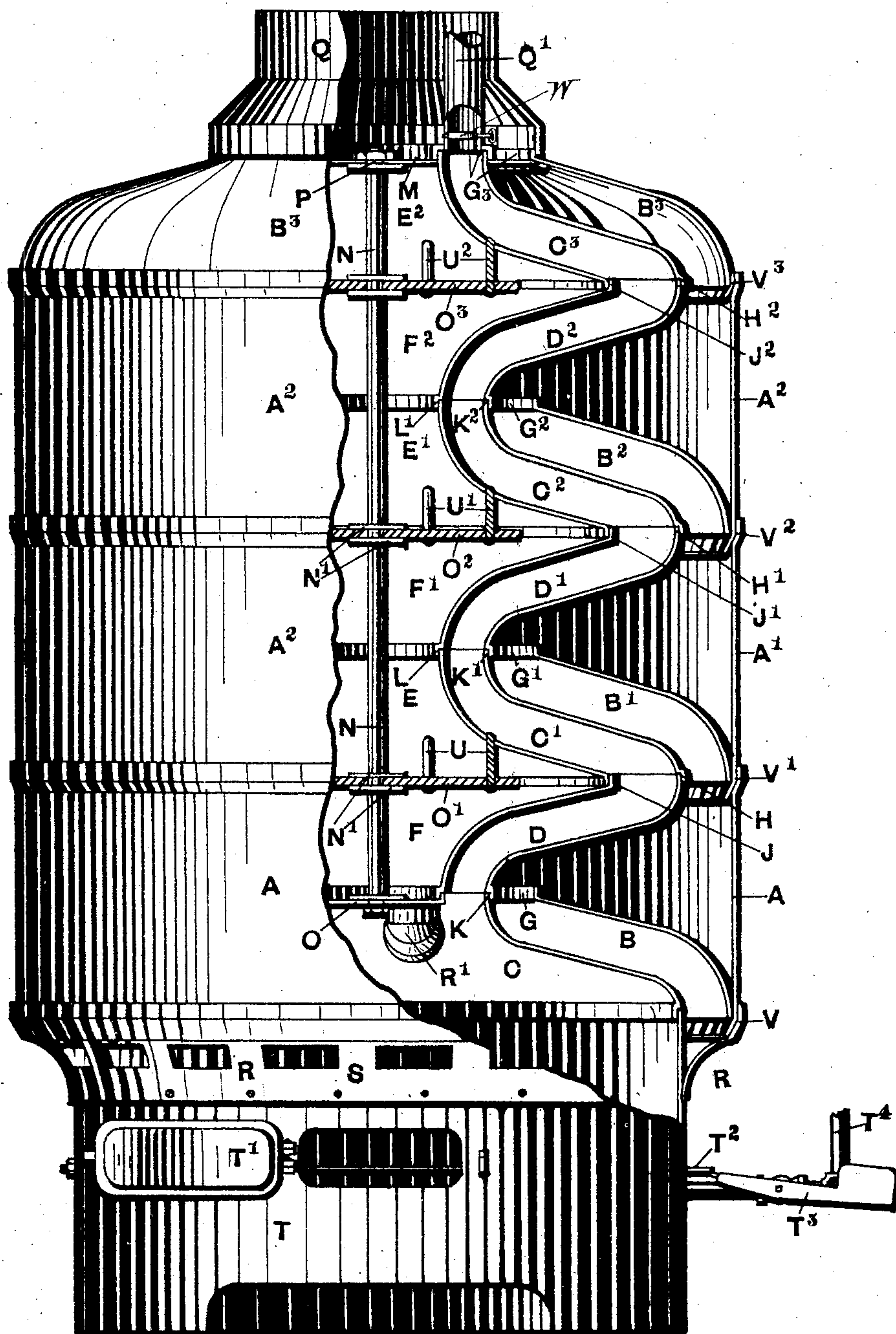


FIG. 1.

WITNESSES

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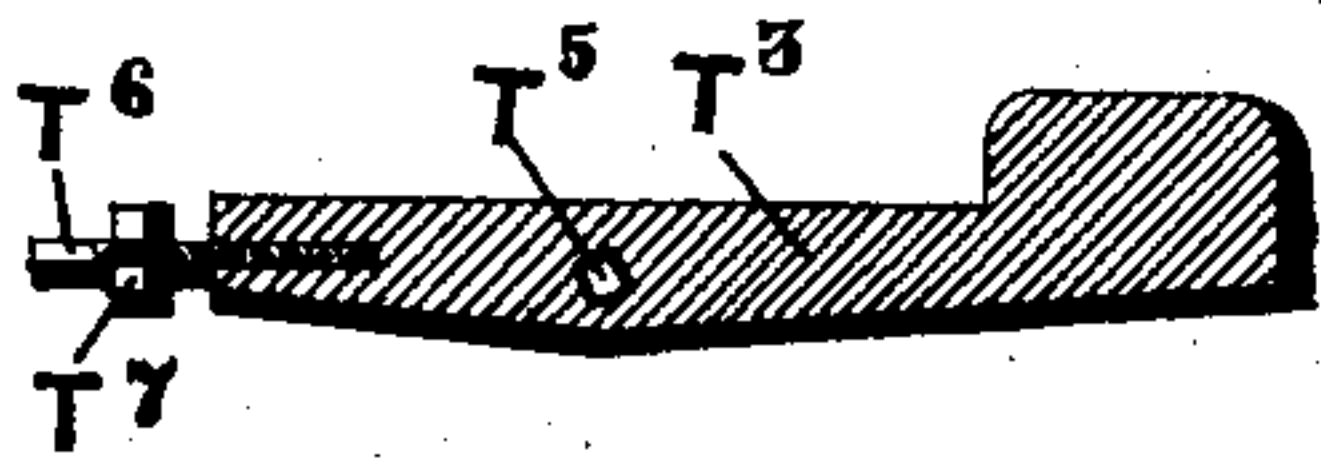


FIG. 3.

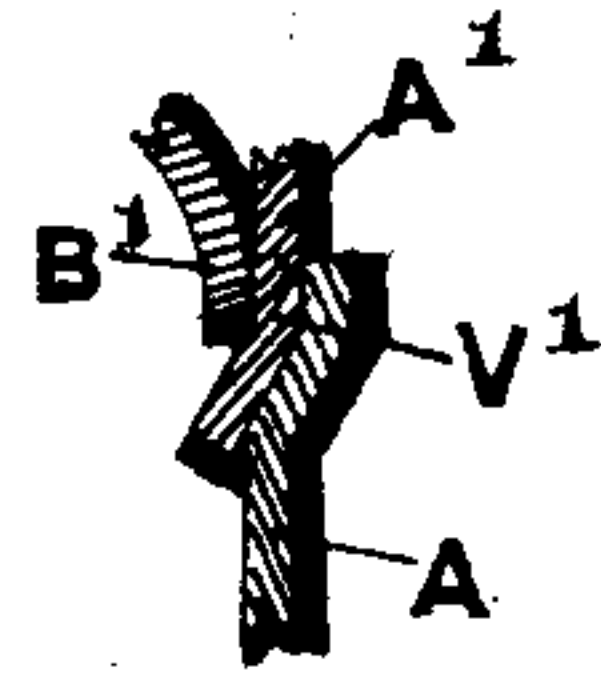


FIG. 4.

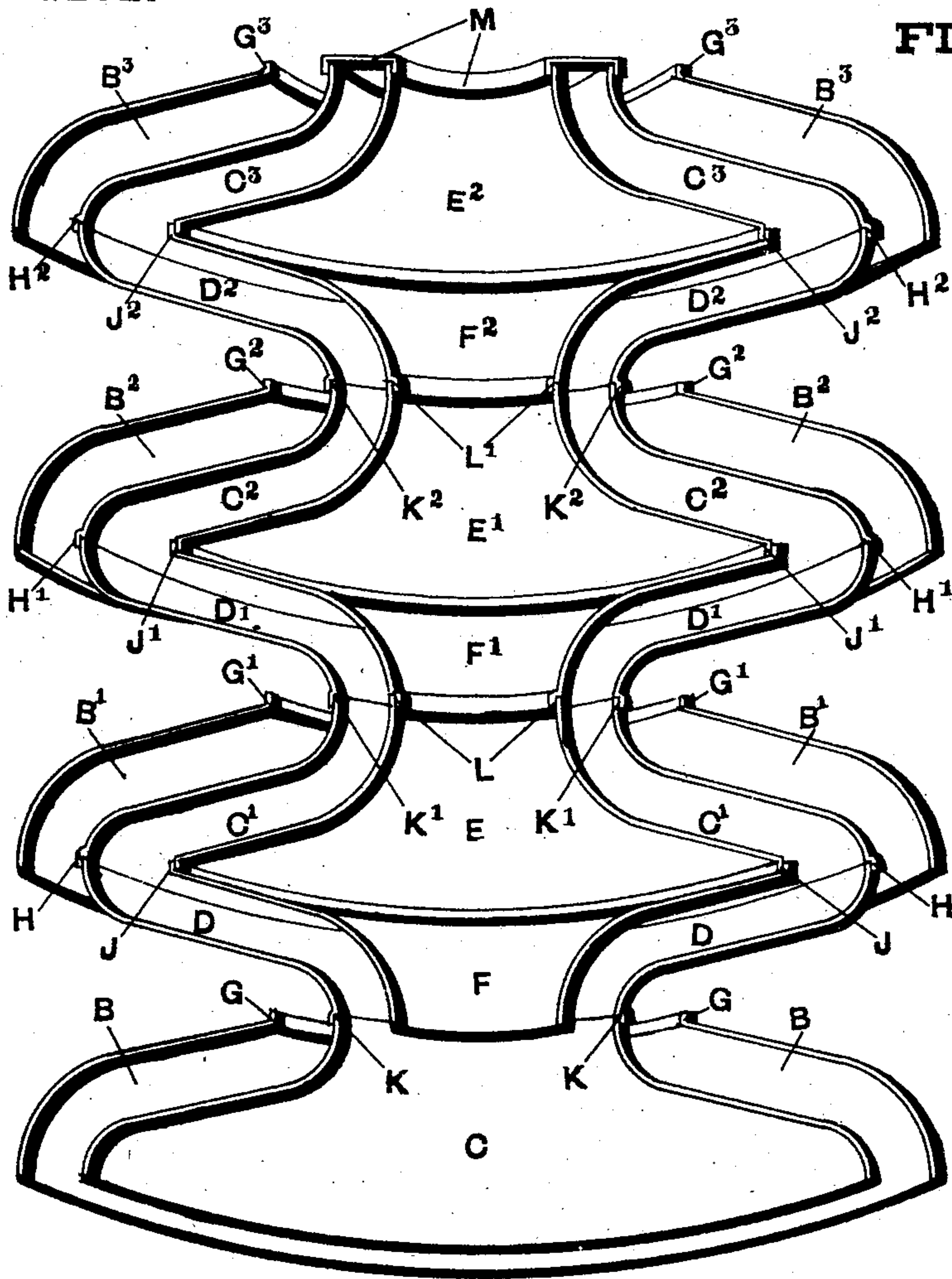


FIG. 2.

WITNESSES

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UNITED STATES PATENT OFFICE.

EPHRAIM LABERGE, OF MONTREAL, CANADA.

GAS-HEATER.

SPECIFICATION forming part of Letters Patent No. 786,300, dated April 4, 1905.

Application filed December 5, 1904. Serial No. 235,450.

To all whom it may concern:

Be it known that I, EPHRAIM LABERGE, a subject of the King of Great Britain, residing at Montreal, in the Province of Quebec and Dominion of Canada, have invented a new and useful Gas-Heater, of which the following is a specification.

My invention relates to improvements in stoves or furnaces of what are known as the "hot-air" type, in which the air is circulated over and between heated surfaces and when at the desired temperature is discharged through suitable conduit-flues into the rooms or other chambers which are to be heated. It relates, however, more particularly to gas-stoves of that class which are designed to employ either natural or artificial gases as a fuel in such a manner that, if desired, there would be no intermingling of the products of combustion with the heated air, thereby contaminating the same.

A principal object of my invention lies in the provision of a heating apparatus as above defined of such improved construction and arrangement of parts that the greatest possible proportion of the total heat generated by the burner will be converted into heat utilized solely for the purposes of warmth.

A further object of my invention is to so adapt the parts of the same that the radiating and absorbing surfaces will produce the greatest possible draft and circulation of the air to be heated and at the same time will allow a minimum amount of heat to escape absorption and pass away through the outlet-flue.

A further object of my invention is to form a heater composed, essentially, of a system of units so designed with relation to themselves and other parts of the device that any given number of them may be assembled into an operative structure the size of which will depend upon the number of parts incorporated into the same. Such a system permits of the greatest of elasticity, and predetermined sizes may be readily reached according to the will of the operator.

A still further object of my invention is to provide a heater which while of the greatest

simplicity and of fewest number of parts in design and construction will nevertheless be very effective in operation and durable in service and at the same time be capable of being made, transported, and assembled at small cost.

Further objects and advantages of my invention will appear upon reference to the following description and claims, when taken in connection with the accompanying drawings, in which like letters of reference denote corresponding parts throughout all the figures, of which—

Figure 1 is a general upright view of my invention, being shown partly in section. Fig. 2 is a view in sectional perspective from a position looking backward at the units of my system. Fig. 3 is a sectional view showing the adjustably-weighted lever forming a part of my cut-off. Fig. 4 is an enlarged view illustrating the jointure between the dished plates.

Referring to the drawings now more particularly by reference-letters, it will be seen that my invention comprises, essentially, a number of units so shaped and dished that they may be automatically fitted together, so as to formulate a heater having a main serpentine passage-way for the heated gases resulting from the combustion, and surrounding such passage-way are proper channels for the circulation of the air which is to be heated in my device, whereby the automatic circulation will be insured.

The baffle-plates or units of my system are of uniform proportion and adapted for close-fitted application to each other to form a structure of the type previously designated.

In Fig. 1 I have illustrated a furnace composed of three main sections resting upon a suitable fire-box and surmounted by a cap of suitable construction adapted for the carrying off of the products of combustion and the heated air. The fire-box comprises a cylindrical casing T, having a suitable door T' and in the upper end an annular supporting-ring S, provided with numerous perforations R, thereby creating a proper air-inlet for the outer heating-chamber. The gases from the burner, which is located within the base, are

intended to pass upward and follow a serpentine course between the baffle-plates, being deflected into the entrance of the annular passage-way between said plates by the outer top plate C. The annular gas-space results from the arrangement of the inner baffle-plates F, E, F', E', F'', and E'', which are successively joined together, as will appear from the drawings, and the outer baffle-plates D, C', D', C'', D'', and C''', likewise successively connected. The joints of the former series, which I have shown by J, L, J', L', and J'', are preferably best made by a slight dishing of the plates, as will appear from the illustrations, and the joints of the outer series, which I have designated by K, H, K', H', K'', and H'', are similarly devised. In order that full heating effect may be obtained from the heated annular gas-chamber, I provide means for deflecting the air which is to be heated in a similar serpentine course, both adjacent the interior and the exterior of said heated chamber. For the interior arrangement I provide a bottom closure O for the baffle-plate F and admit sufficient air through the said plate O by means of a flue-pipe R'. In regular sequence, corresponding with the large diameter of the interior formed by the prior-mentioned series of baffle-plates, I arrange deflecting-plates O', O'', and O''', which are suitably affixed by bolts U in a median position in respect to the baffle-plates between which it lies. These plates are furthermore positioned, by means of suitable connections N', to a central vertical rod N, which is bolted at P to the top annular cap M, and thereby serves to position the heretofore-mentioned baffle-plates, as well as the bottom cap O. It will thus be seen that this arrangement provides a system in which the air entering the inner chamber follows a regular serpentine course while adapted for the high degree of heating efficiency which I desire to attain and finally emerges at the top into an outlet-pipe Q.

In order to fully utilize the exterior heating-surface of the gas-chamber, I provide a series of baffle-plates B, B', B'', and B''', as well as the cylindrically-inclosing rings A, A', and A'', so dished and proportioned that adjustable tight joints will be formed, as illustrated at B, B', and B'', it being observed that this last-mentioned series of plates is supported by the annular ring S. The inner plates B, B', B'', and B''' are so proportioned as to leave suitable annular spaces G, G', G'', and G''' adjacent the inner connections of the gas-chamber, whereby the ready flow of the external fresh air along a serpentine passage adjacent the heated plates is insured. This air emerges, as does the inner air, into a discharge-pipe Q.

At the top of the gas-chamber I provide a circular annular plate M, from which leads a pipe Q' for the carrying off of the products of

combustion. In order that the scope of the latter may be regulated, I provide a suitable damper W, which is adapted for partial or complete closure.

I have discovered that a very high degree of efficiency is attained when the above-mentioned damper is wholly closed and the heated gases are completely retained within their chamber, since thereby no heat whatever is lost by being carried through the pipe Q'.

I furthermore provide my heater with an automatic cut-off apparatus, which is as follows: The gas for the burner enters through the pipe T'''' and passes through a valve to the outer stem end T''''', to which is secured the eccentrically-weighted lever T'''', which is provided at the end opposite the weight with an adjustable contact T'''''' and T''''''', which will be readily understood by reference to Fig. 3. This contact-point is adapted to coact with the expansible rod T'', which is positioned above the burner and protrudes, as will appear from Fig. 1. This rod is made of any suitable non-combustible material having a sufficiently high coefficient of expansion and suitably rigid for the purpose, and, as will be apparent, the instant the same is cooled owing to the lack of gas-supply, resulting in the extinguishment of the burner, it will contract, release the weighted lever T'''', and the latter by swinging down will wholly close the gas-supply.

It will now be readily seen and understood from the foregoing that the various objects of my invention have been very completely carried out by my present adaptation and that because of the serpentine highly-heated air-passages in the interior of the furnace the cool air in the room will be drawn into the same and discharged in a highly-heated condition without any contamination whatever with the smoke, gas, and other products of combustion, which will pass up the flue to the chimney without any intermingling with the pure air.

It is obvious that such changes in the manner of operation and minor details of construction of such parts as fairly fall within the scope of my invention may be made without departing from the purpose or sacrificing any of the advantages thereof—as, for instance, it is obvious that dampers or other equivalent devices for regulating the flow of the outgoing or incoming gases may be provided, as well as modifications in the arrangement of the heating-chambers and baffle-plates; but this will be regulated and understood upon referring to the appended claims, wherein the true scope of the invention is more exactly expressed.

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

1. In a gas-heater, a vertical series of superposed similar outer inclosing sections

which flare outwardly at their upper end and inwardly as a flange at their lower end, whereby a short telescopic joint is formed, dome-shaped deflecting-plates therewithin, supported at their lower extremities by said inturned flanges, a cylindrically-shaped base member having an exterior perforated ring for supporting said sections and plates, a series of successively-superposed baffle-plates the lower of which is lap-jointed to the base member and an inner series of like baffle-plates hung from the top, said plates arranged to form a serpentine vertical passage for the products of combustion, and a central series of horizontal plane deflecting-plates.

2. In a gas-heater, a vertical series of superposed similar outer inclosing sections which flare outwardly at their upper end and inwardly as a flange at their lower end, whereby a short telescopic joint is formed, dome-shaped deflecting-plates therewithin support-

ed at their lower extremities by said inturned flanges, a cylindrically-shaped base member having an exterior perforated ring for supporting said sections and plates, a series of successively-superposed baffle-plates the lower of which is lap-jointed to and supported by the base member, a cap-plate carried by the upper end of said series of baffle-plates, a sectional rod depending therefrom, a series of plane horizontal deflecting-plates carried thereby, a base-plate attached to the end thereof and an inner series of baffle-plates supported upon said base-plate, said baffle-plates arranged to form a serpentine vertical passage for the products of combustion.

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

EPHRAIM LABERGE.

Witnesses:

ALBERTA NATHAN,
STUART R. W. ALLEN.