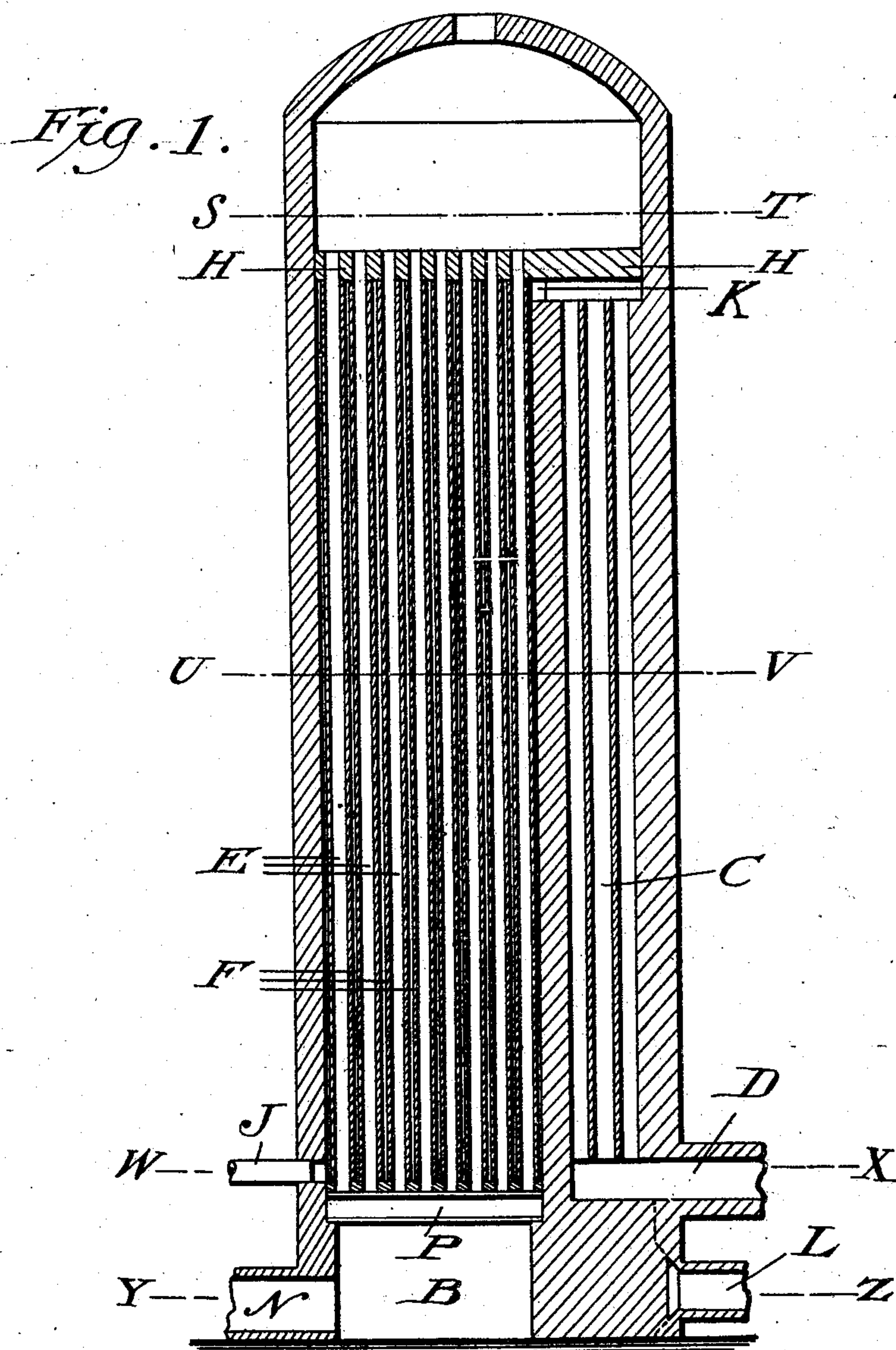


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BLAST HEATING APPARATUS FOR FURNACES.
APPLICATION FILED DEC. 31, 1907.

2 SHEETS—SHEET 1.



WITNESSES
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2 SHEETS—SHEET 2.

Fig. 2.

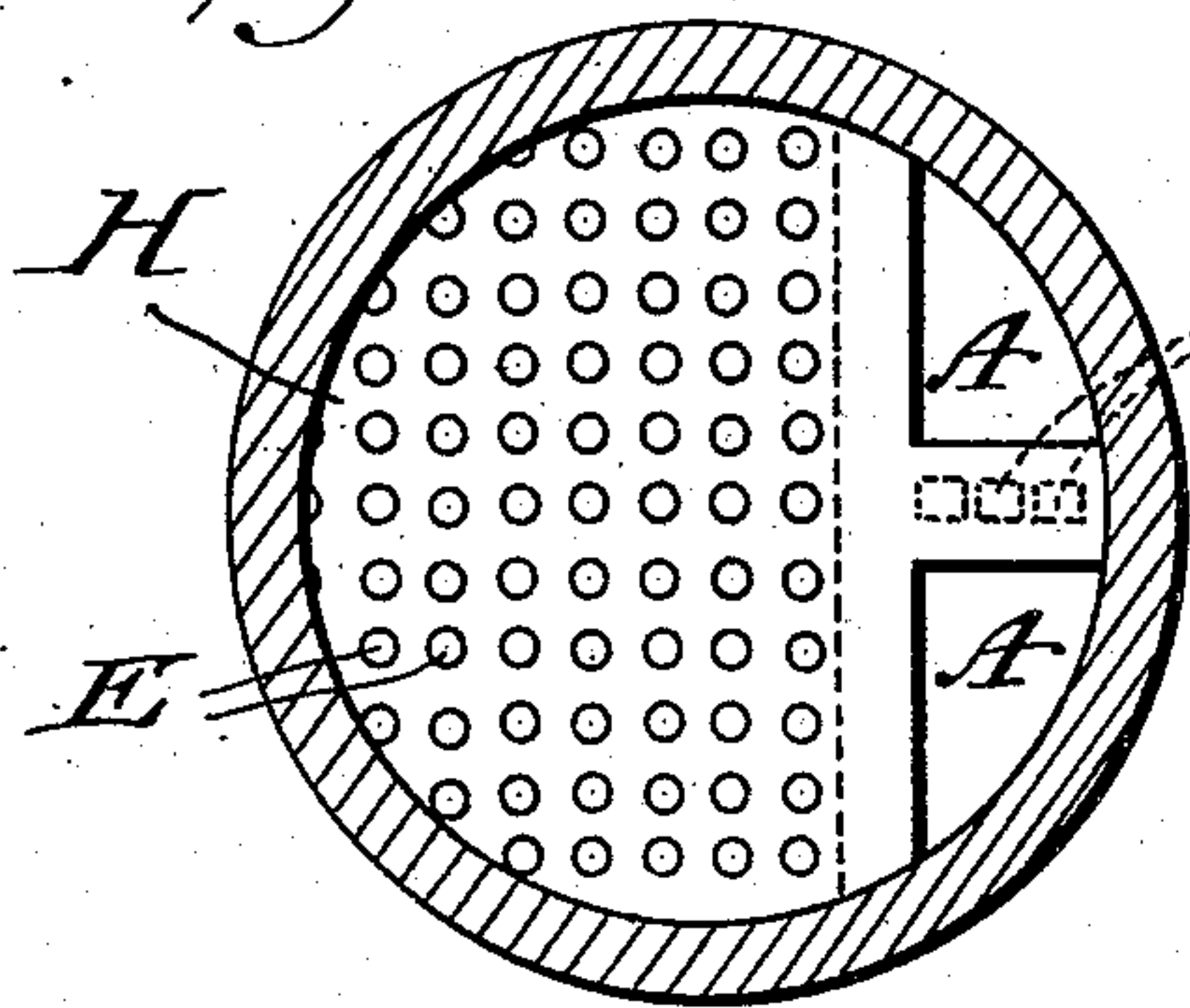


Fig. 4.

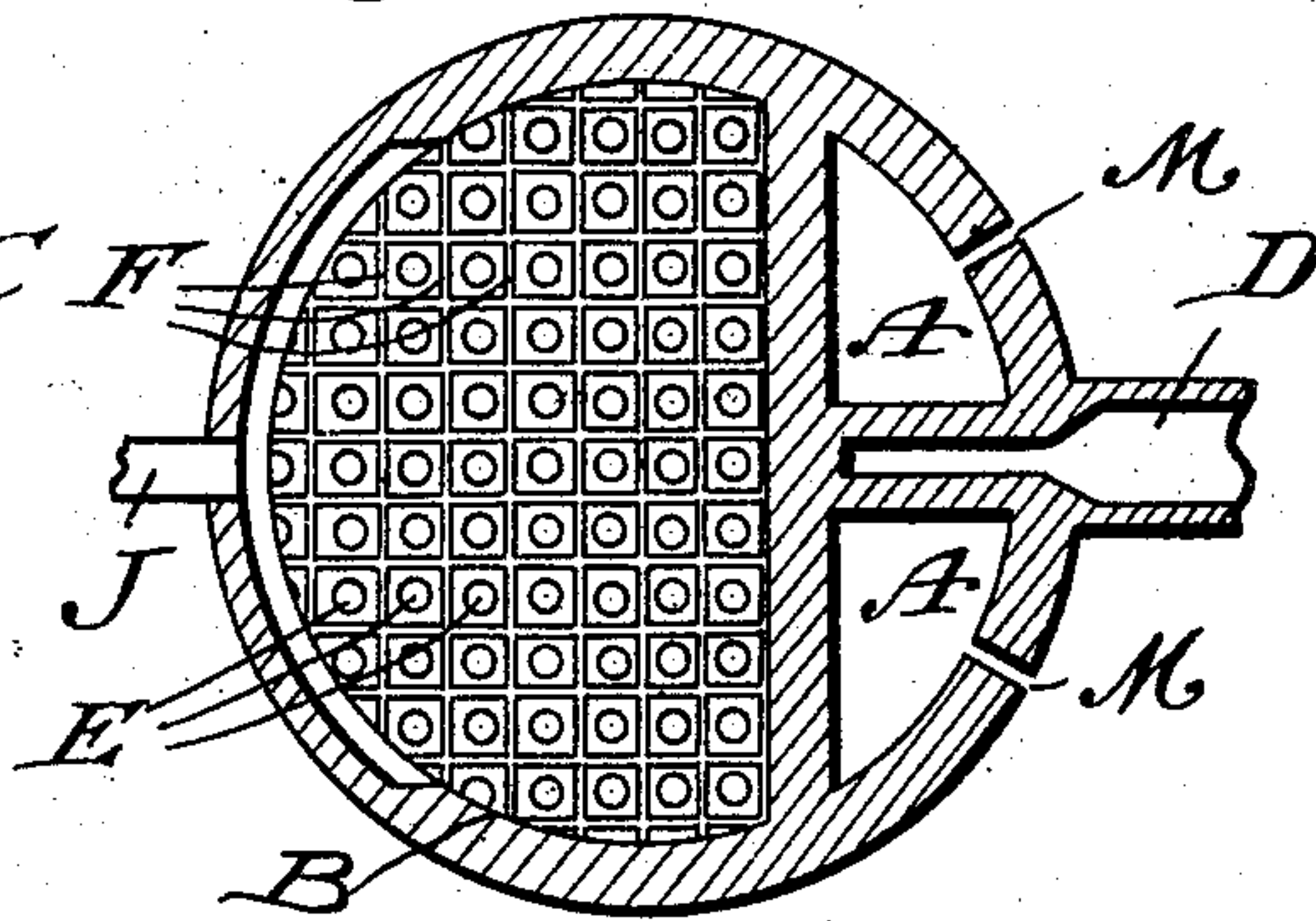


Fig. 3.

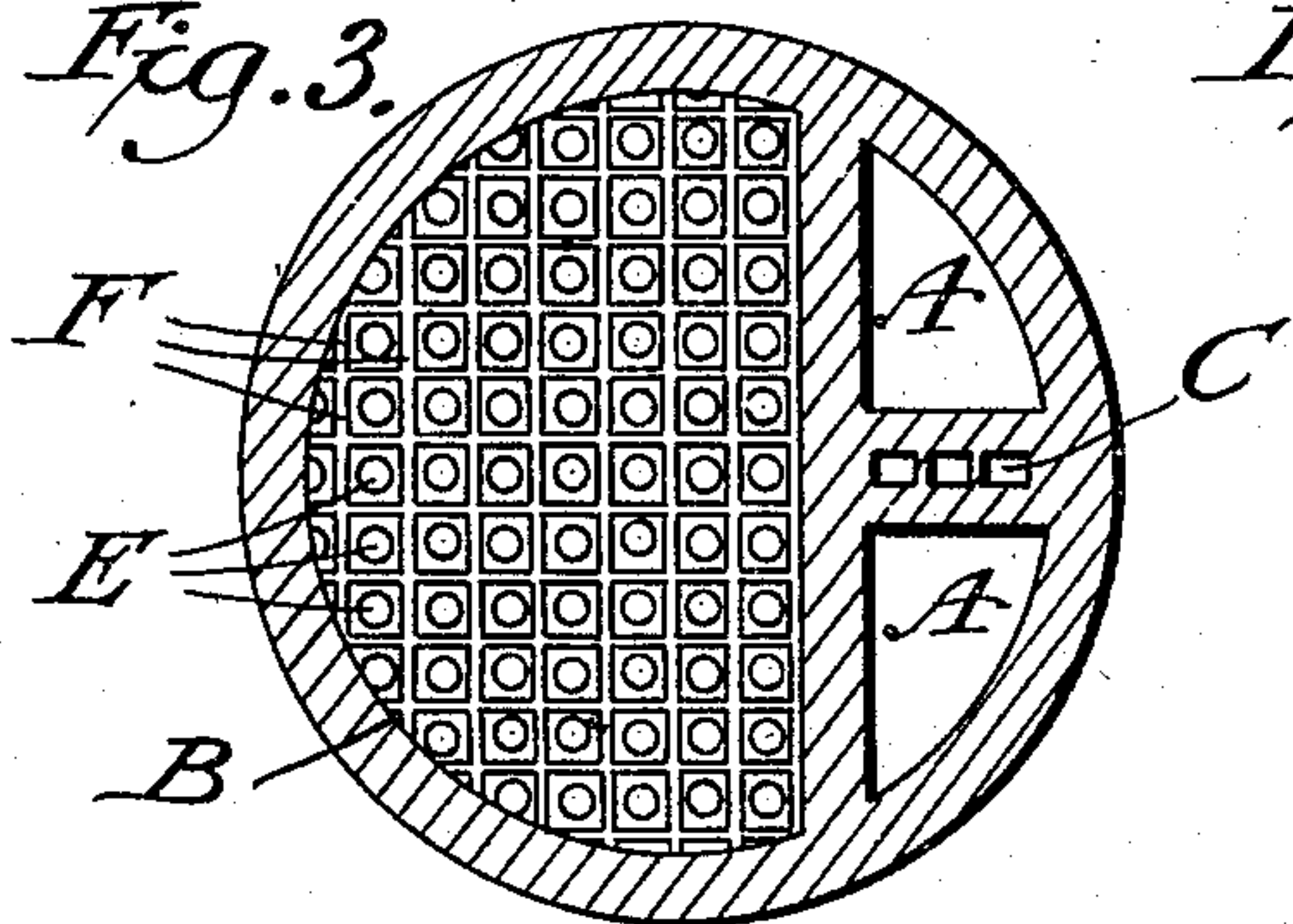


Fig. 5.

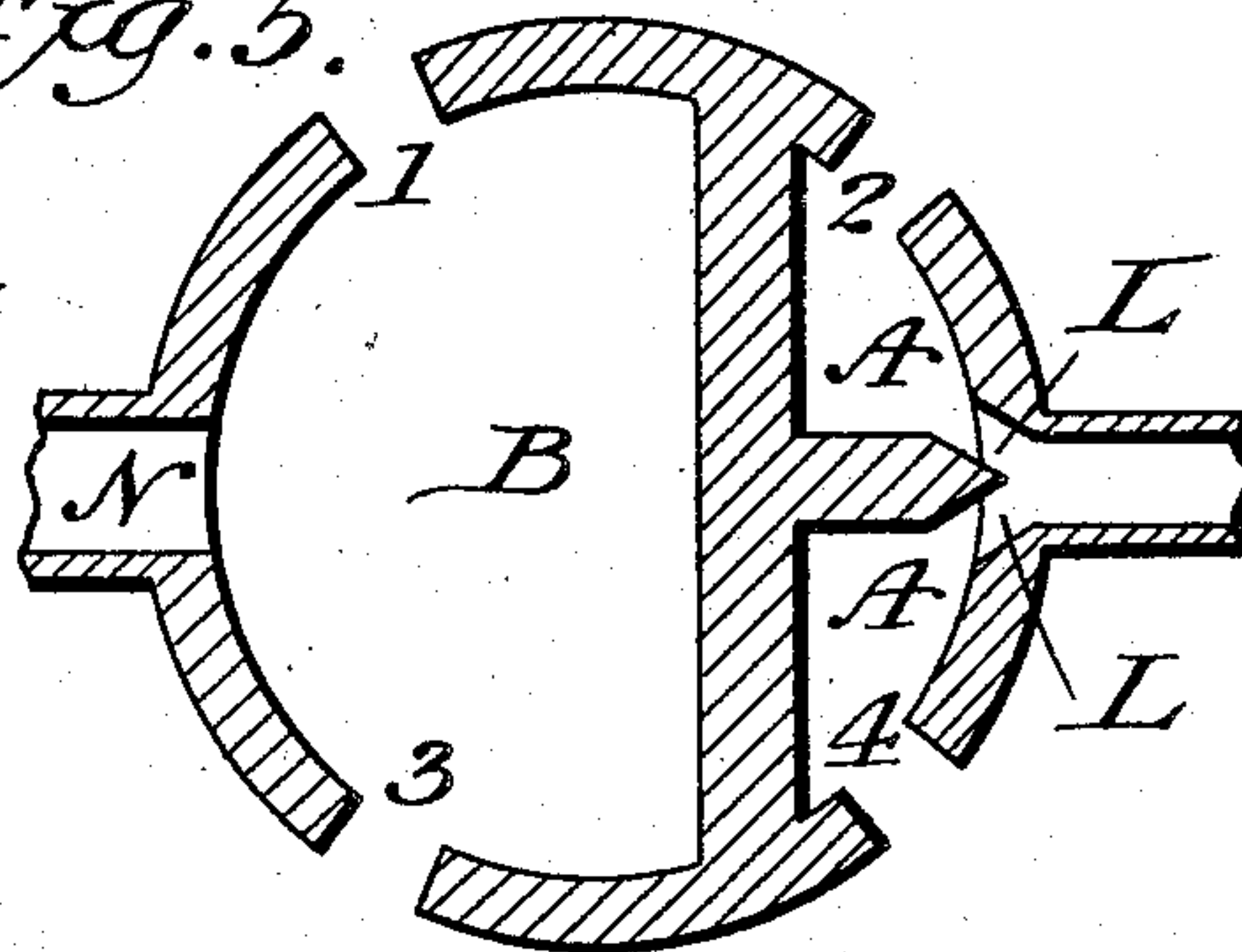
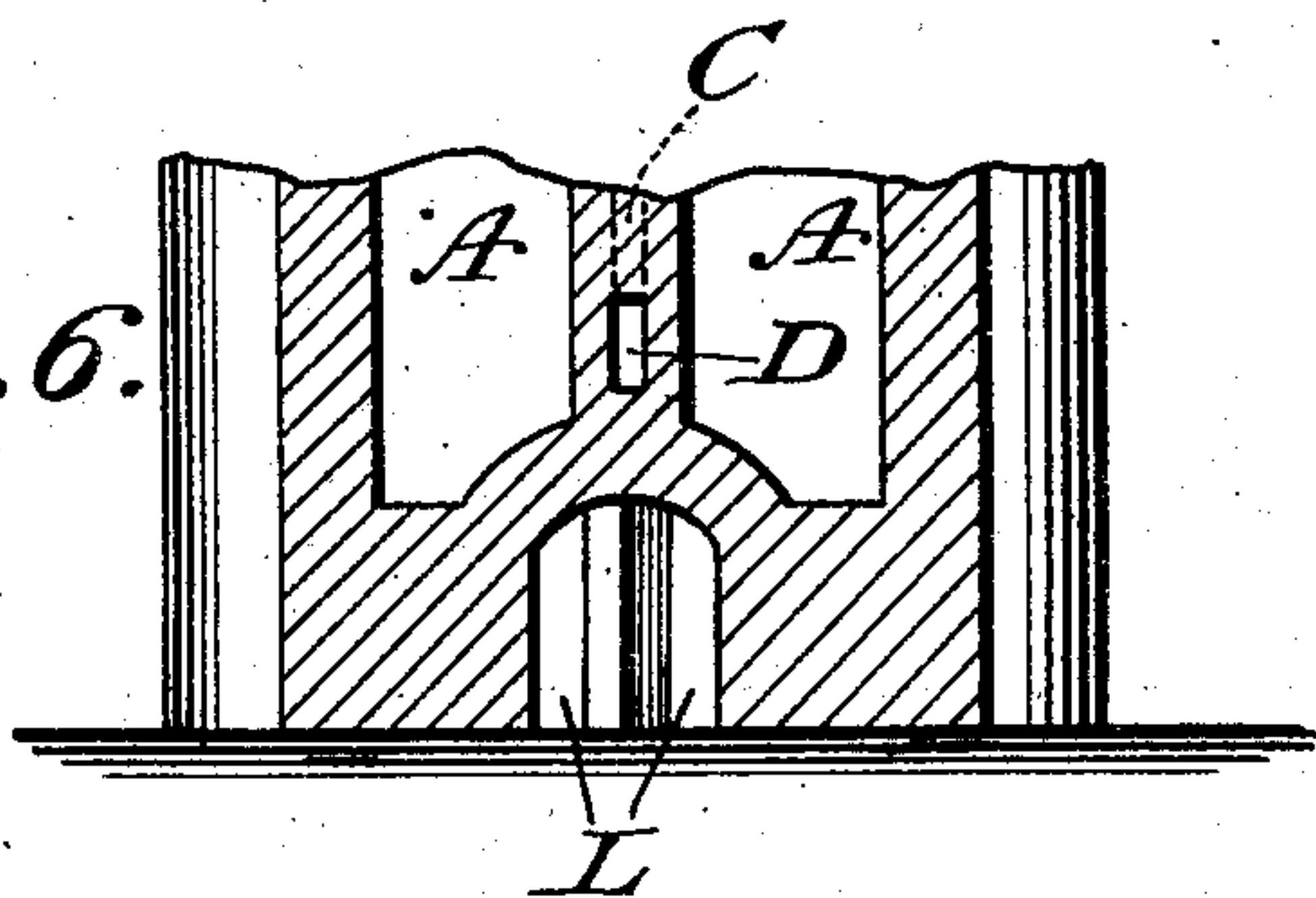


Fig. 6.



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BLAST-HEATING APPARATUS FOR FURNACES.

No. 891,452.

Specification of Letters Patent.

Patented June 23, 1908.

Application filed December 31, 1907. Serial No. 408,771.

To all whom it may concern:

Be it known that I, WILLIAM A. WHEELER, a subject of the King of Great-Britain, and residing at North Side, Workington, in the county of Cumberland, England, have invented certain new and useful Improvements in Blast-Heating Apparatus for Furnaces, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention is an improvement in stoves or other apparatus for producing hot air blast for furnaces; and the object thereof is to insure a continual and regular supply of clean and hot air blast to a blast furnace.

A further object of the invention is to keep the gas and blast separate, by means of a hollow division wall in the combustion chamber. The gas passing from the bottom to the top of the stove, at the outside of the division wall, the blast, being forced to the furnace, passing in the opposite direction inside the division wall.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which;—

Figure 1 shows a view of the hot blast stove in section and the passage K, Fig. 2 is a sectional plan at S. T. on Fig. 1, and shows the combustion chamber A. A. and the circular passages or flues through which the burning gas passes down the regenerative chamber. Fig. 3 is a sectional plan at U. V. on Fig. 1, the view shows the holes C through which the hot blast passes down the division wall in the combustion chamber A. A., it also shows the circular gas flues in the blocks E, together with the spaces F round the blocks E through which the blast passes up through the regenerative chamber B. Fig. 4 is a sectional plan at W. X. Fig. 1, the view shows the blast inlet J and the means of spreading it through the spaces F by the open flue on the inside of the brick lining that runs partly round the regenerative chamber B, and it also shows the outlet of the hot blast at D after passing down through the holes in the partition wall in the combustion chamber A. A. The inlets M. M. show where the air enters the combustion chamber A. A. in order to burn the gas. Fig. 5 is a sectional plan at Y. Z. on Fig. 1, showing the bottom of the stove. L, L, is the gas inlet and N, is

the gas outlet into the main chimney flue. 1, 2, 3 and 4 are manholes for cleaning purposes. Fig. 6 shows the gas inlets L, L, by the point of the division wall in the combustion chamber. D shows the outlet for the hot blast.

The advantages claimed for the above invention are as follows: The stove will supply a continual and regular heat. It will require no changing from air to gas or vice versa, and no dust will enter the furnace.

The brickwork is inclosed in the usual air-tight cylindrical casing of wrought iron or steel plates. A minimum space of half an inch allowed for expansion between brick lining and casing. The combustion chamber A is separated from the regenerative chamber B by a wall running from the bottom to within a short distance of the top or dome of the stove. The combustion chamber is itself divided by a wall running to the top of the regenerative chamber. The division wall of the combustion chamber is built of fire blocks, the open spaces in them being equal to the surge of the hot blast outlet.

The regenerative chamber is filled in with fire blocks, with a circular hole in the center of each block to form a continuous passage or flue for the burning gas. The blocks in regenerative chamber are to be set so as to allow a space of about an inch on each side as shown, except the first course at the bottom, and the three last at the top which will be larger and be properly fitted together, and jointed with fireproof cement thus preventing the gas and blast becoming mixed.

The whole of the blocks forming the flues in the regenerative chamber are to be carried on strong spaced girders P as in Fig. 1. The blast will enter the stove at J passing round the open flue in the bricklining shown in Fig. 4, and being then distributed will pass upwardly or in the opposite direction to the gas, through the spaces F between the blocks in the regenerative chamber, and then through the opening K down the passages C in the blocks, that form the division wall of the combustion chamber and pass through D to the furnace.

The air supply is regulated at M. M. one on each side of the combustion chamber A. A. The gas will enter the combustion chamber at L, L, and then pass up each side of the division wall C and be distributed over the whole of the upper part of the stove and be drawn down through the holes or flues E in

the regenerative chamber, and between the girders P to the chimney flue N, thus the blast forced through the spaces F and the holes or flues in the division wall C will receive the heat from the burned gases which pass up through the chambers A. A. and down through the flues or holes E.

In the operation of my improved apparatus the gas passes upwardly through the separate divisions of the combustion chamber A and downwardly through the flues formed by the bricks or blocks in the regenerative chamber, while the blast passes upwardly through spaces round said bricks or blocks and then down through the passages, openings or flues C in the partition of the combustion chamber, and in this operation the said blast is highly heated.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. An air heater for furnaces, comprising a vertically arranged casing having a vertical partition forming a combustion chamber and a regenerative chamber, the combustion chamber being also provided with a vertical partition having flues therein and the regenerative chamber being also provided with vertical flues around which are vertical spaces, the combustion chamber being in communication at the top with the flues in the regenerative chamber and the flues in the partition wall of the combustion chamber

being in communication at the top with the passages around the flues in the regenerative chamber.

2. An air heater for furnaces, comprising a vertically arranged casing having a vertical partition forming a combustion chamber and a regenerative chamber, the combustion chamber being also provided with a vertical partition having flues therein and the regenerative chamber being also provided with vertical flues around which are vertical spaces, the combustion chamber being in communication at the top with the flues in the regenerative chamber and the flues in the partition wall of the combustion chamber being in communication at the top with the passages around the flues in the regenerative chamber; the passage around the flues in the regenerative chamber being also provided with an inlet at the bottom, and the flues in the partition of the combustion chamber being provided with an outlet at the bottom and the flues in the regenerative chamber being provided with an outlet at the bottom.

In testimony that I claim the foregoing as my invention I have signed my name in presence of the subscribing witnesses this 16th day of December 1907.

WILLIAM ALFRED WHEELER.

Witnesses:

THOMAS SLACK STRONG,
WILLIAM NIXON.