

No. 791,344.

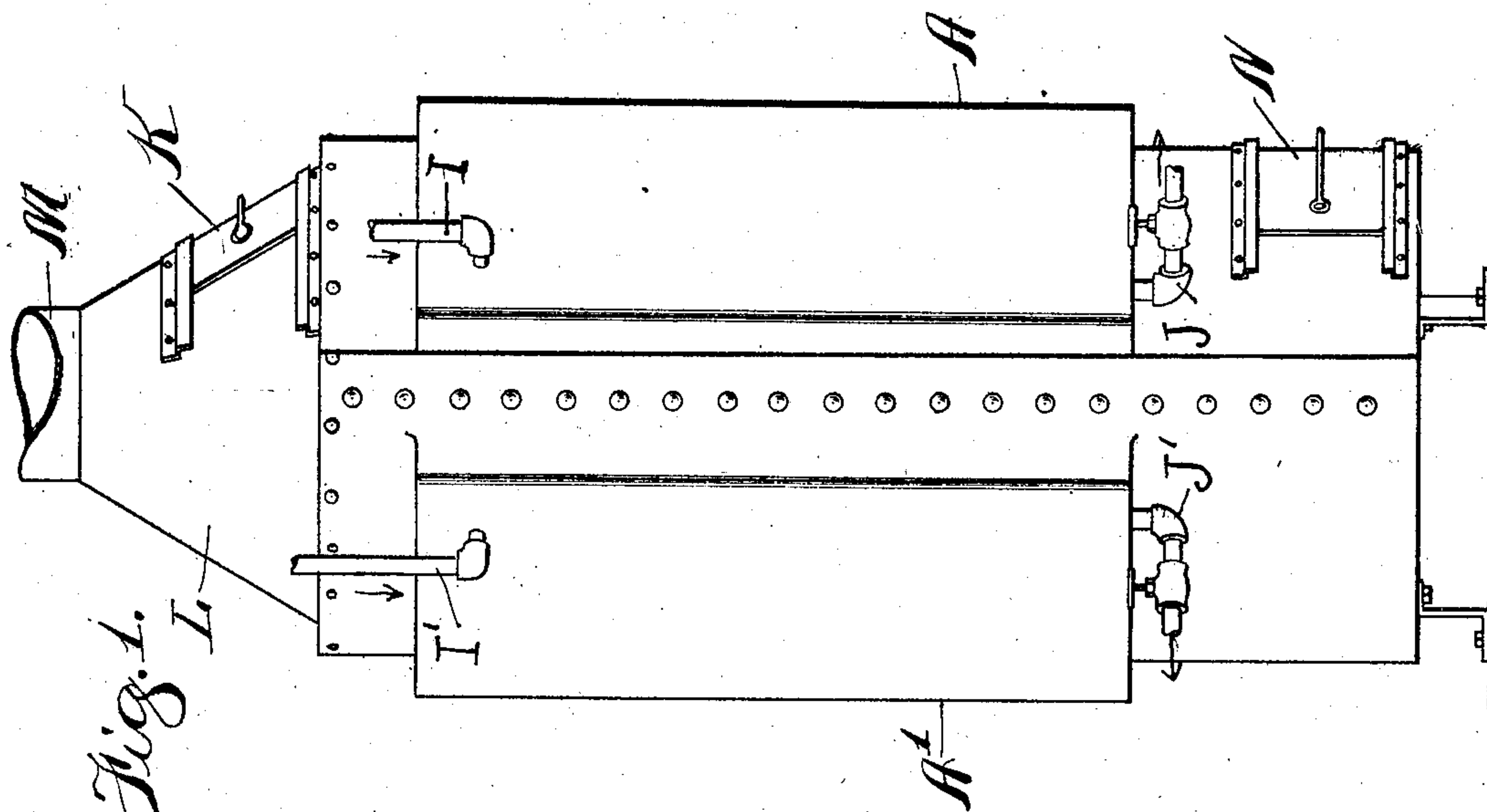
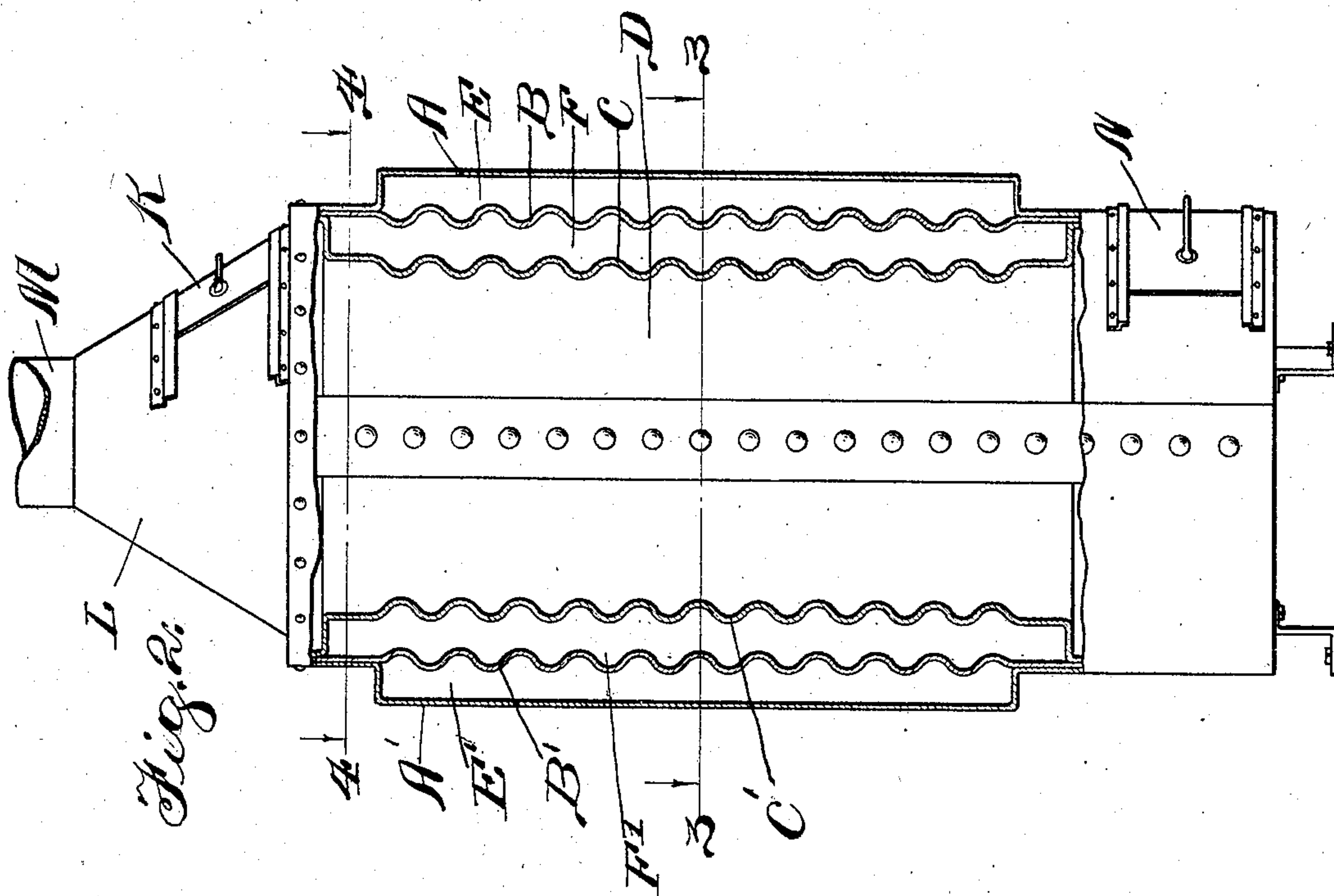
PATENTED MAY 30, 1905.

W. H. JONES.

HEATER.

APPLICATION FILED JULY 8, 1904.

2 SHEETS—SHEET 1.



Witnesses:

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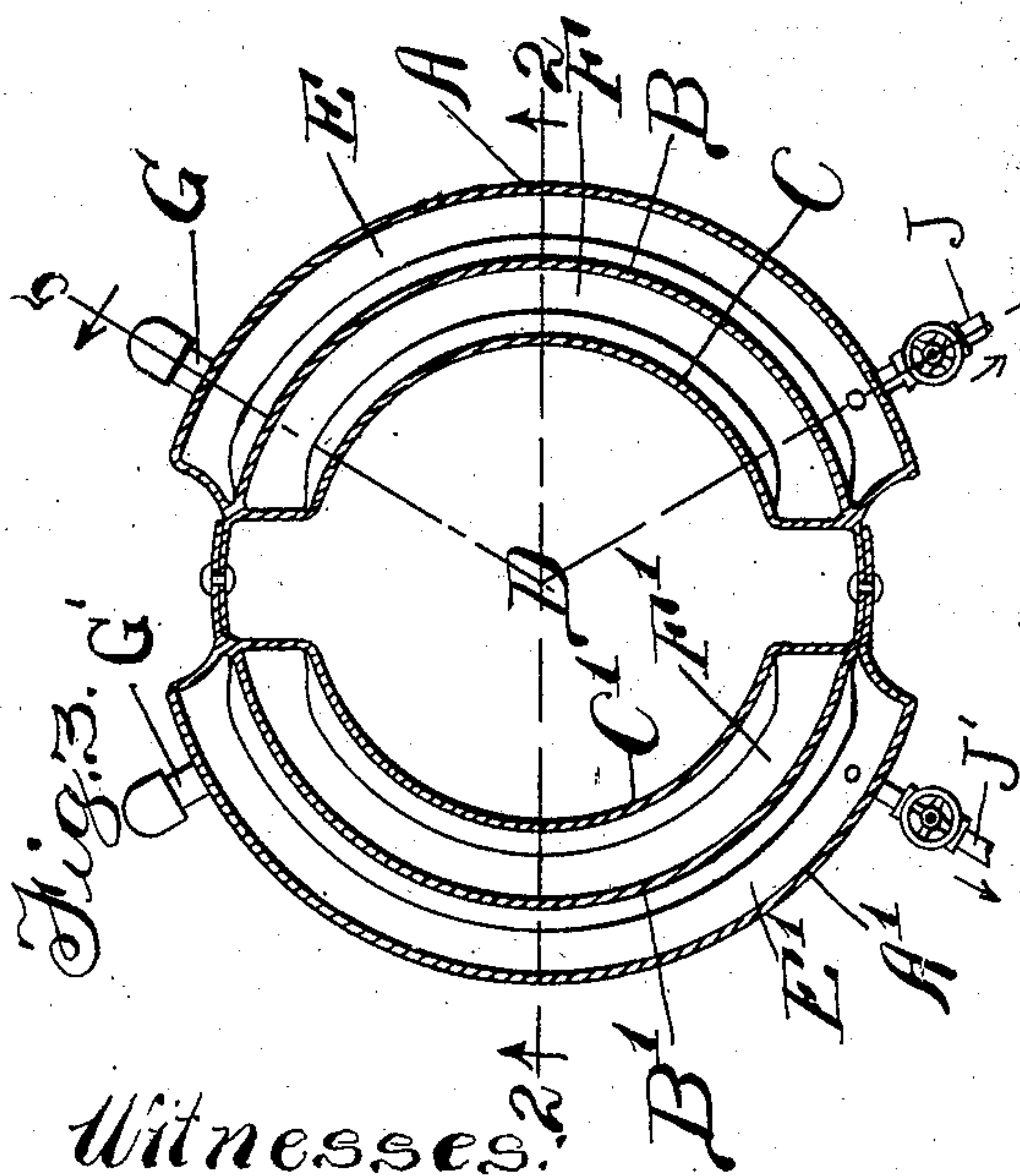
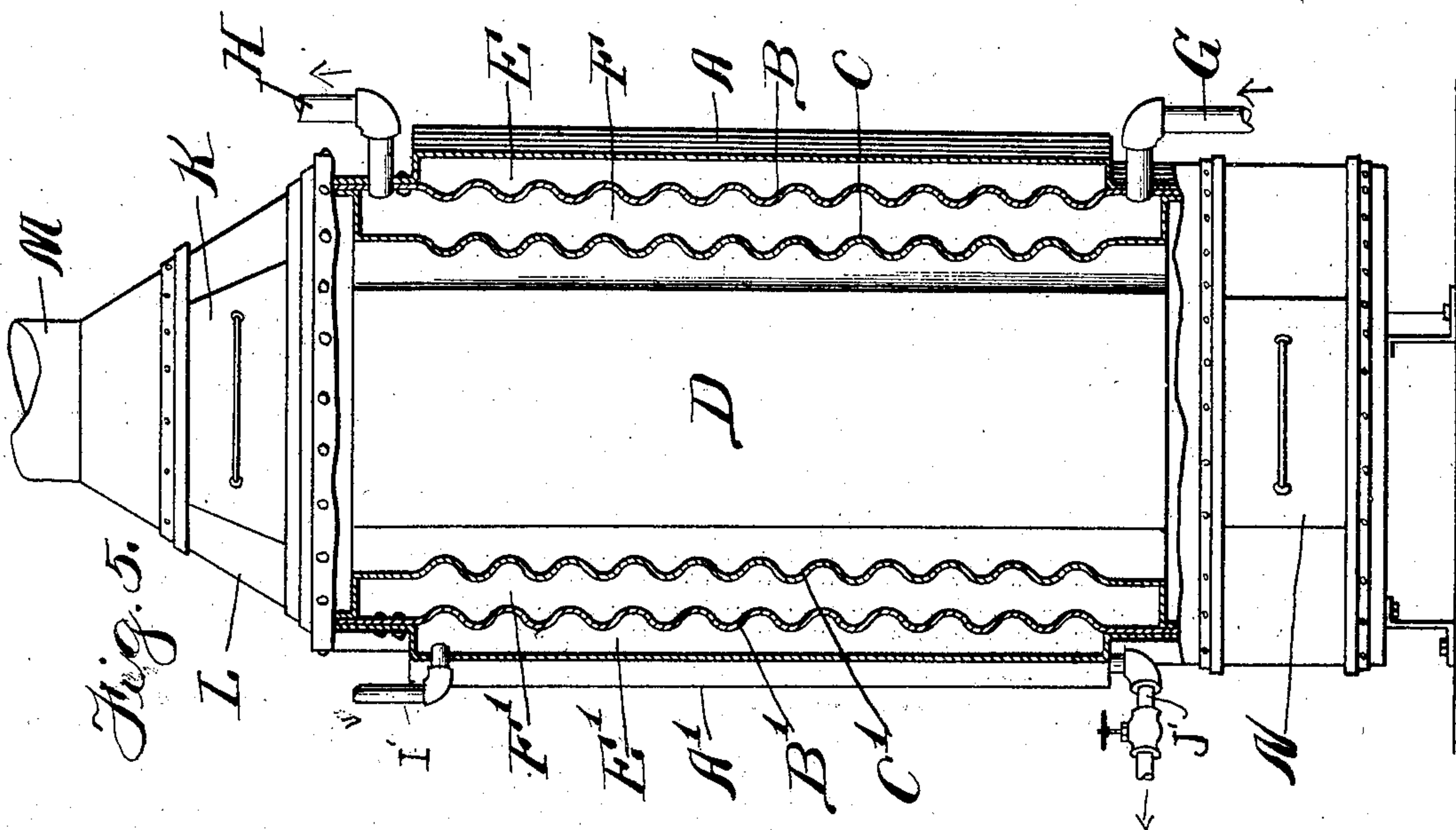
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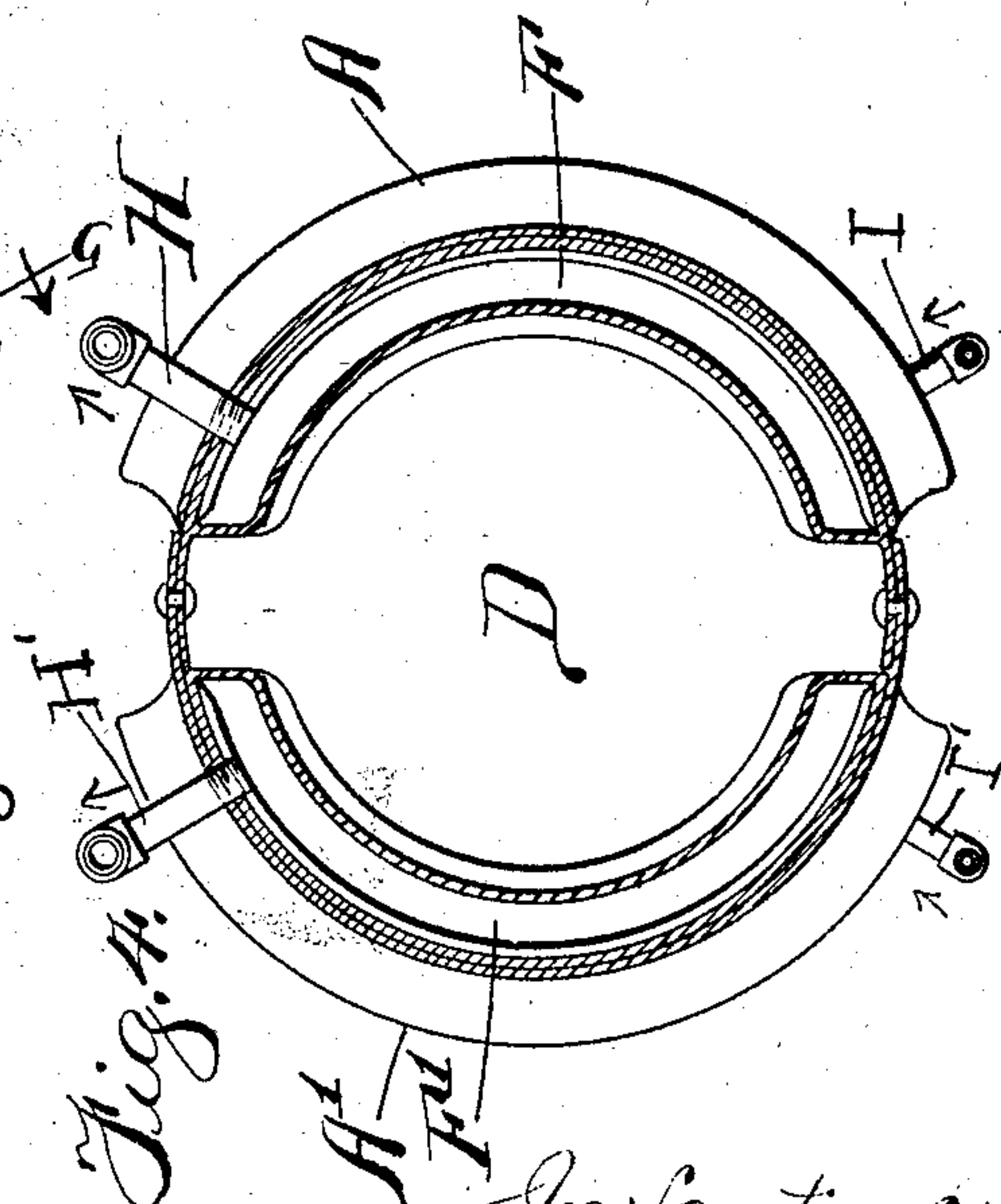
W. H. JONES.
HEATER.

APPLICATION FILED JULY 8, 1904.

2 SHEETS—SHEET 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM H. JONES, OF PULLMAN, ILLINOIS, ASSIGNOR OF TWO-THIRDS
TO EGBERT H. GOLD, OF CHICAGO, ILLINOIS.

HEATER.

SPECIFICATION forming part of Letters Patent No. 791,344, dated May 30, 1905.

Application filed July 8, 1904. Serial No. 215,787.

To all whom it may concern:

Be it known that I, WILLIAM H. JONES, a citizen of the United States, residing at Pullman, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Heaters, of which the following is a specification.

My invention relates to improvements in hot-water heaters adaptable for various purposes, but especially adapted and intended for use in car-heating systems in which a body of heated water is caused to circulate through a closed circulating system comprising two heaters in operative contact therewith, said heaters consisting of a primary heater, in which the heat is supplied by live steam from the locomotive or elsewhere, and a secondary or emergency heater, in which heat is supplied by a direct fire in the first box.

The object of my invention is to provide a simple, durable, and comparatively inexpensive heater which shall be efficient and powerful and which may be maintained at a minimum cost for repairs, &c. These and such other objects as may hereinafter appear are attained by my invention, which is embodied in one convenient form thereof in the structure shown in the drawings, in which—

Figure 1 is an elevation of a heater embodying my improvement. Fig. 2 is a vertical sectional view thereof. Fig. 3 is a horizontal section thereof on the line 3 3 of Fig. 2. Fig. 4 is a horizontal section thereof on the line 4 4 of Fig. 2. Fig. 5 is a vertical section thereof on the line 5 5 of Fig. 3.

Like letters of reference indicate the same parts in the several figures of the drawings.

My improved heater consists, primarily, of a triple-walled shell composed of the walls or partitions A, B, and C and A', B', and C'. For reasons which will be hereinafter explained two of these walls or partitions, preferably B C and B' and C', are horizontally corrugated.

The projecting flanges of the partitions A B C are secured together to make a tight joint in any suitable manner; but the best results will be attained by lap-welding these flanges

together. In like manner the partitions A', B', and C' are secured together.

The projecting flanges of the partitions A, B, and C are united to the laterally-projecting flanges of the partitions A', B', and C', which is clearly shown in Figs. 3 and 4, so as to complete the casing of my heater, the partitions C and C' forming the vertical walls of the combustion-chamber D of the heater. It will thus be seen that the vertical walls of my heater in the embodiment thereof shown in the drawings comprises four disconnected chambers E F and E' F', respectively, and preferably the flanges of the partitions forming these chambers are so welded together that each half of the vertical walls of the heater is integral and complete in itself.

One half of the heater is intended for use in the system of heating one side of a car and the other disconnected half for heating the other side of the car.

The chambers F and F' constitute the water-chambers. Water is admitted to the chamber F through a cold-water-inlet pipe G. As the water is heated it rises in the chamber F and escapes through the outlet-pipe H, through the circulating system of the apartment to be heated, commonly a car, in which event the pipe H will usually lead to the ordinary elevated extension-tank common to car-heating systems employing hot water as a heating medium.

A steam-inlet pipe I leads into the chamber E, and an outlet-pipe J leads from the chamber E for the discharge of cold air, water of condensation, &c., the outlet from said pipe being controlled in any suitable manner, as by an automatic trap, a stop-cock, or the like. Fuel may be fed to the interior of the heater through the sliding door K in the top piece L, the products of combustion escaping through the stack M and the ashes being removed through the laterally-slidable door N of the ash-pit.

To heat water by means of steam, steam will be admitted through the pipe I into the compartment E, which constitutes a steam-jacket, and will be radiated through the partition B,

and heat will be radiated from the steam-jacket E into the water in the compartment F, which constitutes a water-jacket, the heated water flowing out through the pipe H and
5 cold water entering through the pipe G.

Inasmuch as the partition B will be exposed to the cooling influence of the water within the water-jacket F, while the partition A will be exposed to atmospheric temperature, the admission of steam into the
10 steam-jacket E will cause an unequal expansion of the partitions A and B. To compensate for this, the partition B is corrugated, and inasmuch as all three partitions are secured together the partition C is likewise
15 corrugated horizontally, so that there may be an unequal expansion as between the partitions A, B, and C without any resulting damage to the apparatus. The necessity for this
20 is also apparent when fire is built within the fire-box D and the partition C is exposed directly to the intense heat of the fire-box, while the partition B is cooled by the water within the water-jacket, and the partition A
25 is still further cooled by the atmosphere.

Of course whenever desired both steam and fire can be applied, in which event the water in the water-jacket F will be exposed on one side to the intense heat of the fire in the fire-box D, which will be radiated through the
30 comparatively thin partition, and will also be exposed to the heat radiated from the steam-jacket E through the partition C, thus producing a very powerful action.

It will be observed that with this structure there are no separate coils to install, the fire-box is entirely unobstructed, so that a fire may be maintained to the full capacity of the heater, the partitions which are exposed to
40 the direct action of the fire are always adequately water-jacketed, so that there will be no danger of burning out the partition, and the cost of replacing the same would be comparatively small. A large radiating-surface is
45 provided both as between the fire-box D and the water-jacket F and as between the steam-jacket E and the water-jacket F, so that a quick, rapid, and powerful heating of the circulating water is obtained.

While I have explained the relation and operation of the fire-box with the partitions A, B, and C and with the steam-jacket and water-jacket E and F, it will be understood that the partitions A', B', and C' and the jackets
55 E' and F' are duplicates thereof and are provided in turn with water inlet and outlet pipes G' and H' and with steam inlet and outlet pipes I' and J'. It will be further noted that in order to provide for the unequal expansion
60 of the different partitions no one of the feed-pipes or discharge-pipes passes through any two partitions. Although such construction is not absolutely necessary for the successful operation of my device, I consider it the preferred construction.
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Obviously many variations in details may be made without departing from the spirit of my invention.

I claim—

1. A heater comprising a casing surrounding the fire-box, said casing being formed of three walls, the space between the inner wall and the middle wall constituting a water-chamber and the space between the middle wall and the outer wall constituting a steam-chamber, the projecting edges of said wall being secured together, the two inner walls being corrugated transversely of their length.
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2. A heater comprising three partitions secured together at their projecting edges, and forming a compound wall for a combustion-chamber, the two inner walls being corrugated transversely of their length, water-pipes connecting directly with the chamber formed by the space between the two inner walls, said
80 85 pipes not passing through the outer wall, a steam-pipe leading to the space between the outer wall and a discharge-pipe leading from said last-named space.

3. A heater comprising two sections secured to each other to form the compound walls of a combustion-chamber, each section comprising three partitions, having their vertical projecting flanges welded together, and having their horizontal edges suitably secured together so as to form two disconnected chambers, one between the outer and middle walls and the second between the middle and inner walls, water supply and discharge pipes communicating directly with the space between
90 95 100 the inner and middle walls without passing through the outer partition, and the two inner walls being corrugated transversely of their length.

4. A car-heater comprising a stove provided with compound walls, said walls consisting of two sections secured to each other to form the outer casing of said stove, sections comprising three partitions secured together at their vertical projecting edges, the space between the outer and middle partitions comprising a steam-chamber and the space between the middle and inner partitions comprising a water-chamber, the middle and inner chambers being corrugated transversely of their length, said corrugated partitions extending beyond the outer wall or partition, water-pipes entering said water-chamber through the extended portion of the middle partition, a steam-pipe entering each of the steam-chambers, and a discharge-pipe communicating with each of the steam-chambers, the two water-chambers being disconnected from each other.
105 110 115 120

5. In a car-heating system, the combination with two independent systems of circulating-pipes for heating the car, of a heater in operative contact with said systems, said heater comprising a stove, the walls of which are formed of two sections, each section comprising three approximately parallel partitions,
125 130

the space between the inner partition and the middle partition of each section constituting independent water-chambers and between the middle partition and the outer partition of each section constituting steam-chambers, the middle partition in each case being corrugated transversely of its length, water inlet and outlet pipes leading into each of said water-chambers, steam-inlet pipes leading into each of said steam-chambers, and outlet-pipes leading from said steam-chambers.

6. The combination with a car-heating sys-

tem comprising two independent sets of circulating-pipes, of a stove, the walls of which comprise two independent water-chambers in operative contact with the combustion-chamber of said stove, means for providing a steam-jacket in operative contact with said independent water-jackets, and means for providing a flow of water through said water-jackets. 15

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