

(No Model.)

2 Sheets—Sheet 1.

R. M. DIXON.
HEATER FOR RAILWAY CARS.

No. 379,691.

Patented Mar. 20, 1888.

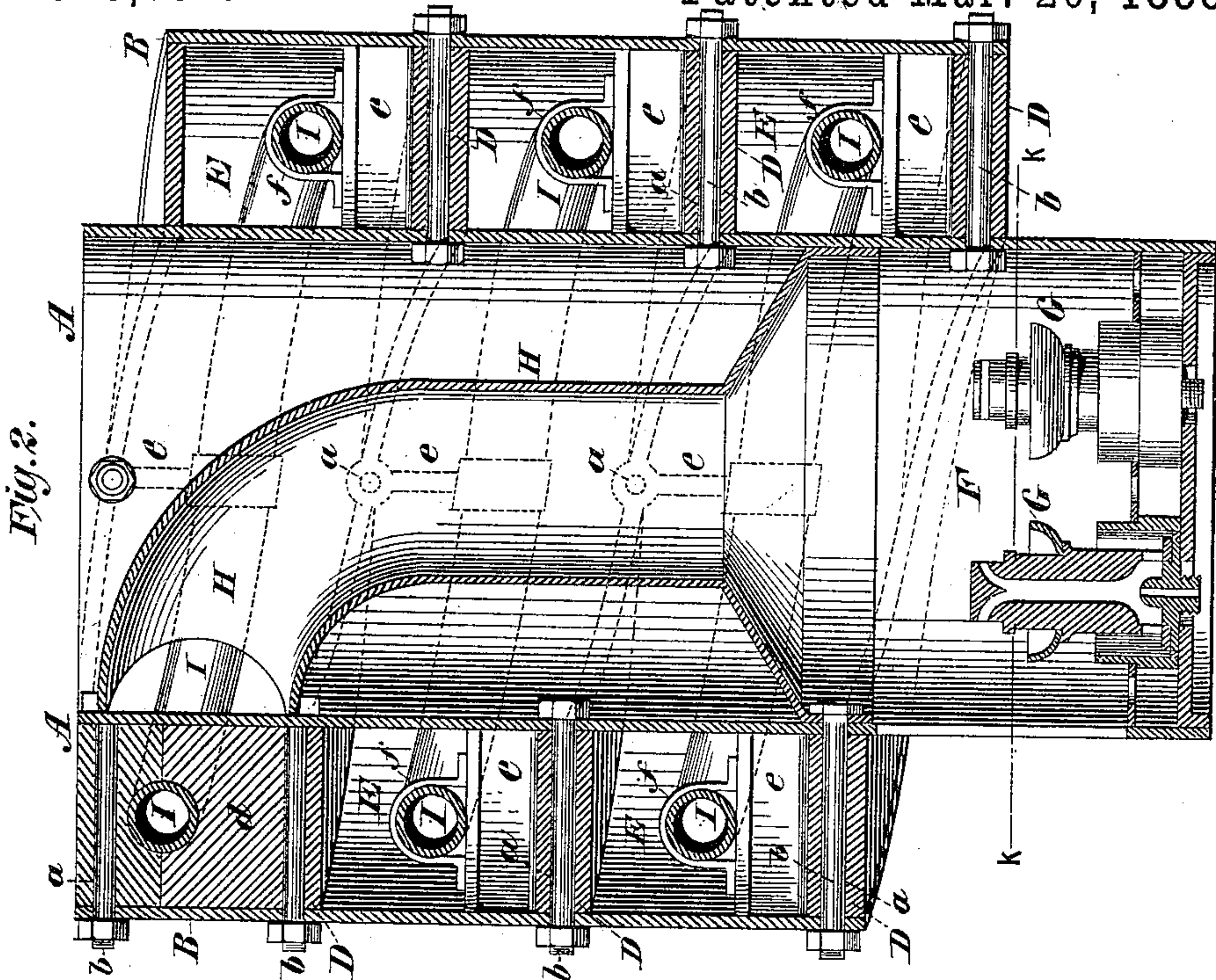
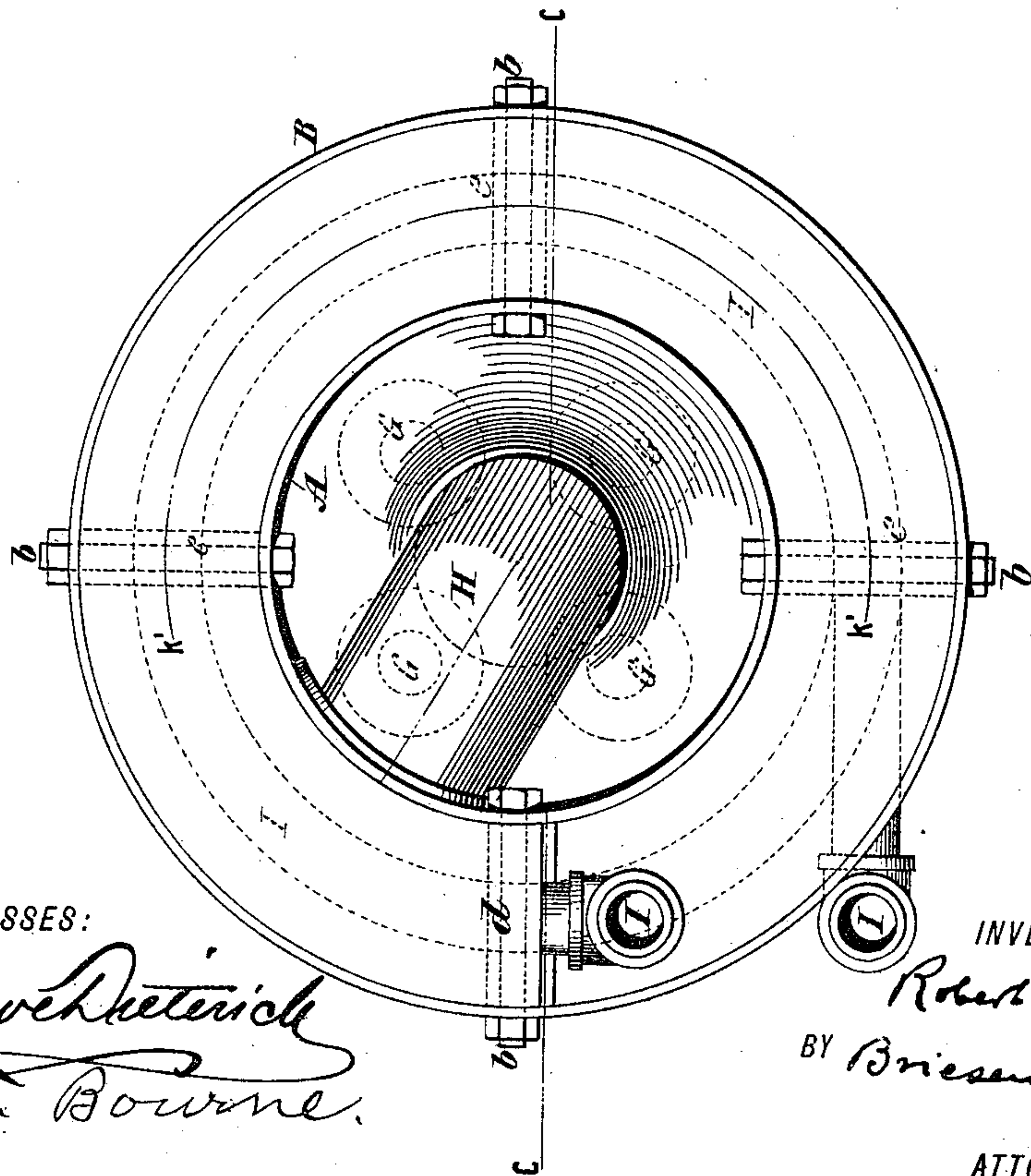


Fig. 1.



WITNESSES:
Custave Dietrich
J. F. Bourne.

INVENTOR
Robert M. Dixon
BY *Briesen & Steele*
ATTORNEYS.

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Fig. 3.

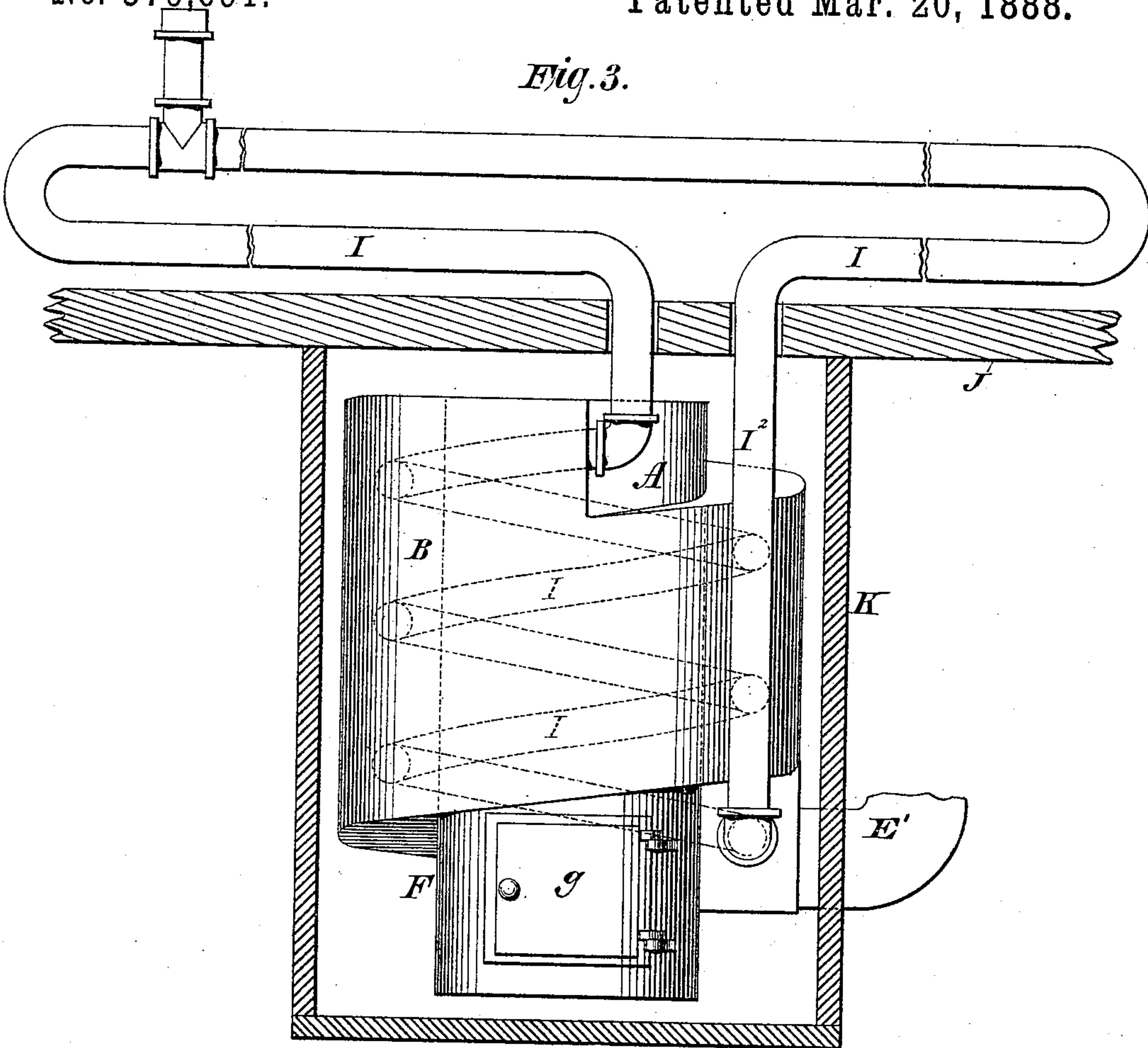


Fig. 6.

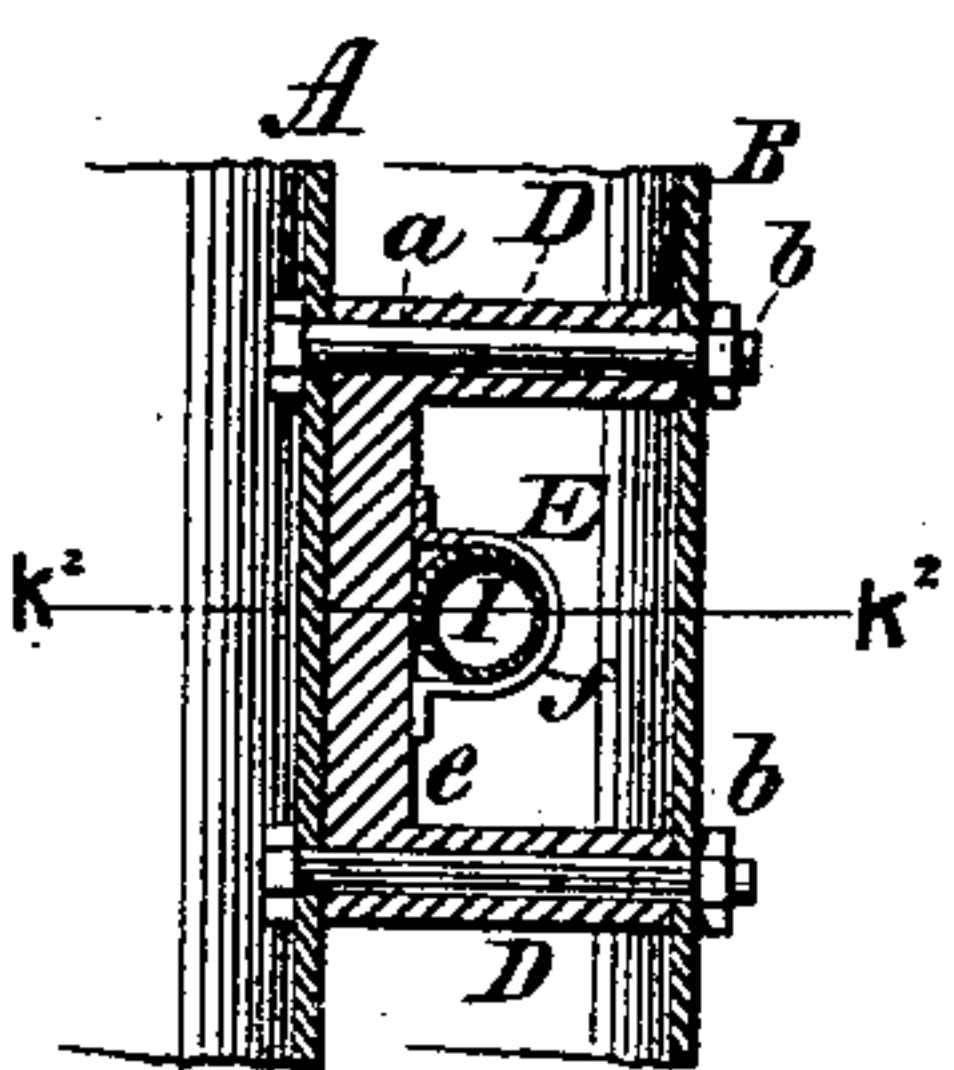


Fig. 4.

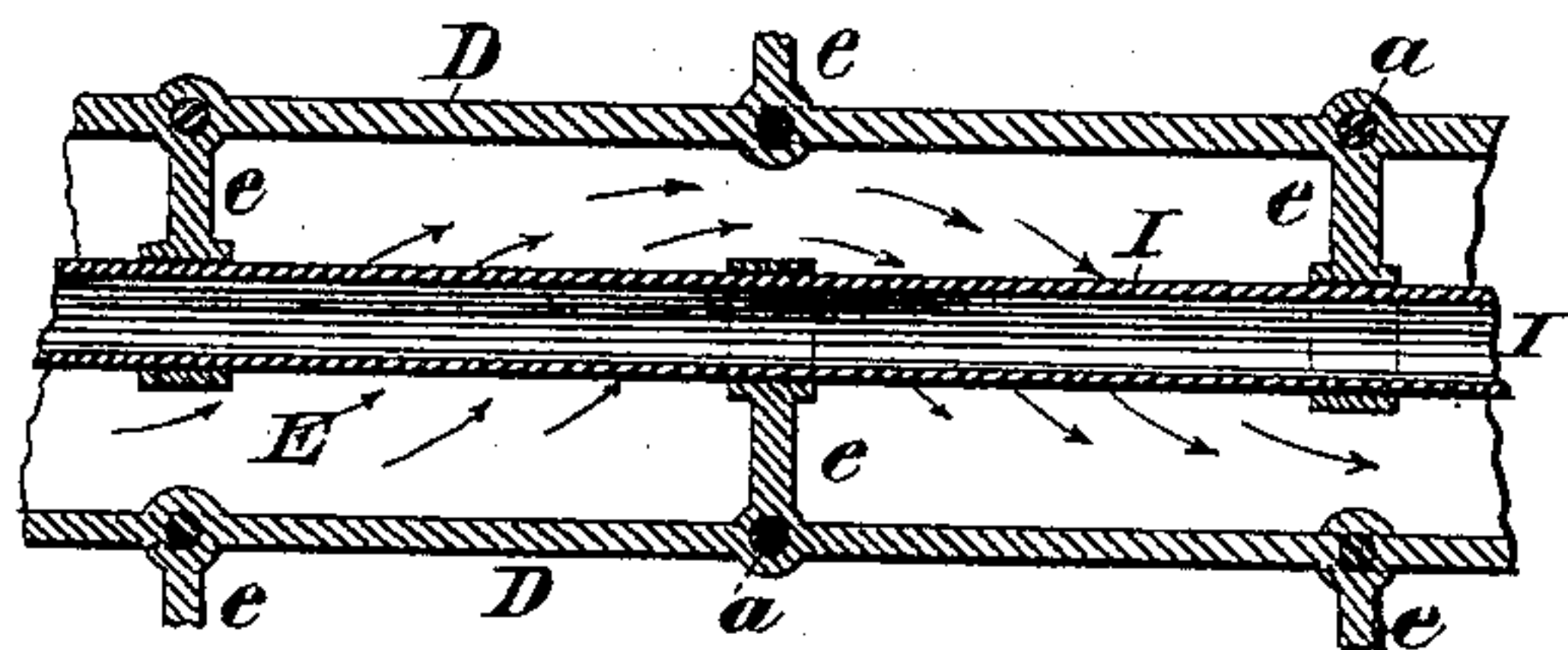


Fig. 5.

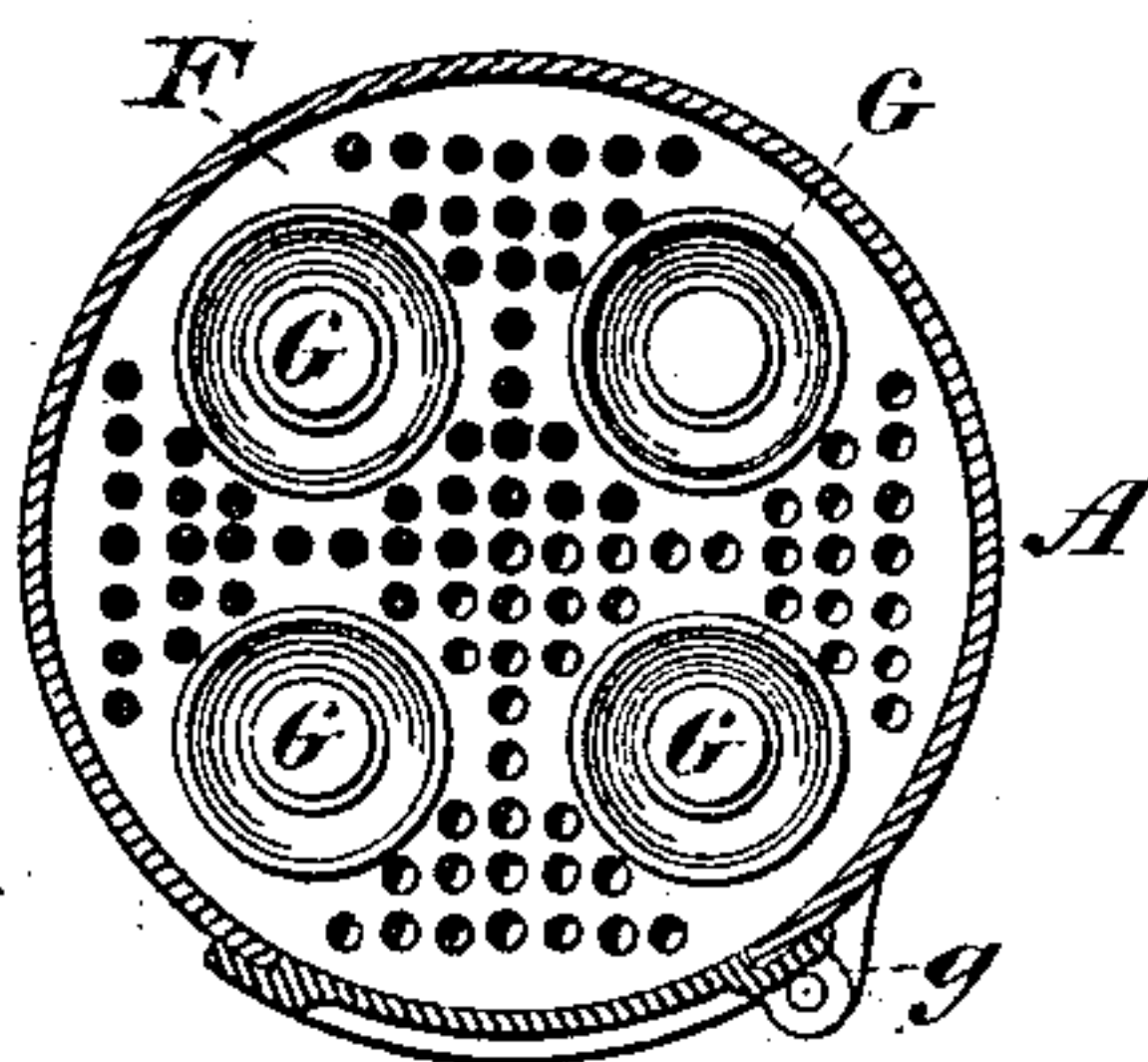
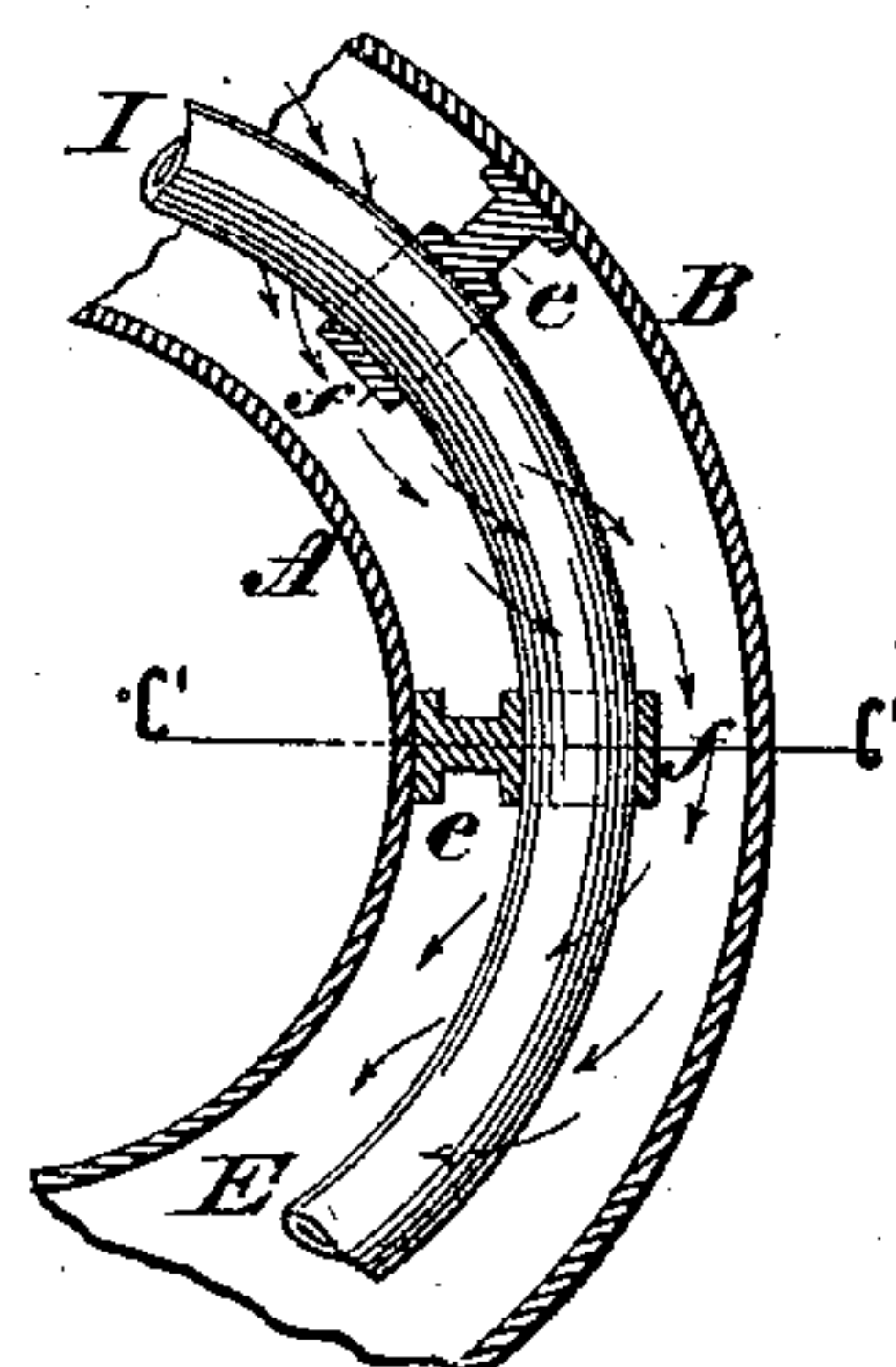


Fig. 7.



WITNESSES:

Gustave Dietrich
T. H. Bourne.

INVENTOR,

Robert M. Dixon.

BY *Briesen & Steele.*

ATTORNEYS.

UNITED STATES PATENT OFFICE.

ROBERT M. DIXON, OF EAST ORANGE, NEW JERSEY, ASSIGNOR TO THE
PINTSCH LIGHTING COMPANY, OF NEW YORK, N. Y.

HEATER FOR RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 379,691, dated March 20, 1888.

Application filed August 26, 1887. Serial No. 247,906. (No model.)

To all whom it may concern:

Be it known that I, ROBERT M. DIXON, a resident of East Orange, Essex county, New Jersey, have invented an Improved Car-
5 Heater, of which the following is a specification.

The object of this invention is to provide an improved heater for railway-cars.

The invention consists in two cylinders
10 placed one within the other, and of a spiral web or plate forming a spiral channel between the cylinders, and of a pipe leading from a fire-chamber through the spiral channel. The products of combustion pass from the fire-
15 chamber up through said pipe into the upper end of the spiral channel and then take a downward course through said spiral channel.

The invention also consists of a number of ridges or projections arranged at intervals on
20 opposite sides of said spiral web, said ridges serving to throw the products of combustion in thorough contact with the pipe to be heated.

Water, air, or suitable liquid circulates
25 through the said pipe for the heating of the car. The products of combustion passing through the spiral channel heat said pipe and its contents.

The invention further consists in details of construction and combination of parts, which
30 will be more fully hereinafter described.

Reference is to be had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view of a heater constructed according to my invention. Fig. 2 is
35 a vertical cross-section of the same on the line *c c*, Fig. 1. Fig. 3 is a side view of my improved heater, shown as applied to the under side of a car. Fig. 4 is a vertical section on the plane of the line *k' k'*, Fig. 1. Fig. 5 is a
40 horizontal section on the line *k k*, Fig. 2. Fig. 6 is a vertical section, on the line *c' c'*, of the modification shown in Fig. 7, and Fig. 7 is a horizontal section on the line *k² k²*, Fig. 6.

45 A in the accompanying drawings represents a cylinder of suitable construction arranged within another cylinder, B. Between the cylinders A B is placed a web or plate, D, of suitable material, arranged in a spiral, (best shown
50 in Fig. 2,) which forms a spiral channel, E, between the cylinders A and B.

The web D is by preference provided with a number of holes, *a*, through which pass bolts
b, by means of which the cylinders A B and the web D are secured together and held in
55 position.

At or near the lower end of the inner cylinder, A, is arranged a fire-chamber, F, within which are placed any desired number of gas or other burners, G, of suitable construction,
60 which are in connection with a suitable gas or other fuel reservoir carried by the car. A flue, H, extends from the top of the fire-chamber F, through the cylinder A, and opens into the upper part of the spiral channel E. The
65 upper end of the spiral channel E is closed by a partition, *d*.

The web D is provided with a number of ridges or projections, *e*, arranged alternately on opposite sides of said web, as best shown
70 in Figs. 2 and 4. A pipe, I, passes through the channel E and rests by preference upon the ridges *e*, and may also be held in position by means of straps *f*, secured to said ridges, or by other suitable means. The pipe I also
75 passes through the car, as shown in Fig. 3.

The fire-chamber F may be provided with a door, *g*, to permit access to the burners G, also with suitable inlets for air to support combustion.
80

This heater may be carried by the car in any suitable manner, either within the car or on the outside of the same. In the drawings it is represented as being suspended from the bottom J of a car and surrounded by a jacket, K.
85

This improved heater operates as follows: The pipe I is first filled with a liquid or air and the gas turned on and ignited at the burners G. The products of combustion pass up the flue H and enter the channel E. They
90 then take a downward course through said channel and pass out through the lower end of the same, as at E'. In their passage through said channel the products of combustion are prevented from taking an uninterrupted course
95 by the ridges *e*, which cause them to take an undulatory course, passing around and over the pipe I, as shown by the arrows in Figs. 4 and 7. By passing the products of combustion in a circuitous course, as above described, the
100 pipe I and its contents are thoroughly heated.

It is evident that the flue H could be dis-

pensed with and the upper end of the cylinder A closed, the upper end of the channel E opening directly into the cylinder A. The products of combustion in this case would pass up the cylinder A and enter the channel E; but I prefer to use the flue H, as described.

I prefer to use salt-water for the circulating medium through the pipe I. Good effects will also be produced by passing air through the pipe I, and in many instances this will be found of great utility. When the heat is applied to the pipe containing salt-water or the like, the temperature of the contained liquid is increased and its density diminished. This produces an inequality of pressure, causing circulation.

I have shown this heater as being applied to a railway-car; but it is evident that it may be used in many places where such class of heaters is useful.

In the modification shown in Figs. 6 and 7 the ridges *e* are shown attached to the cylinders, and not to the web D, as in the other figures. Both kinds of ridges may also be used in the same structure.

Having now described my invention, what I claim is—

1. In a car-heater, the cylinders A and B, placed one within the other, in combination with the spiral web D between the two cylinders, forming the spiral channel E, and with the pipe I therein, the channel E communicating at its upper end with the cylinder A for receiving and at its lower end with an outlet, E', for discharging the products of combustion, as specified.

2. The combination of the cylinder A and

cylinder B, surrounding same, with the spiral web D, placed between said cylinders and having the openings *a*, and with the bolts *b*, passing through said openings and into the cylinders A and B, substantially as described.

3. The cylinders A and B, placed one within the other, combined with the spiral web D between said cylinders, forming the spiral channel E, and with the alternating ridges *e* and pipe I within said channel, substantially as described.

4. The cylinder A and cylinder B, in combination with the web D, forming the spiral channel E between said cylinders, and with the pipe I within the channel E, fire-chamber F, and flue H, within the cylinder A and leading from the fire-chamber directly into the upper end of the channel E, substantially as described.

5. The cylinders A B, web D, and alternating ridges *e*, forming the channel E, in combination with the fire-chamber F, flue H, leading from the same into the upper end of the channel E, and pipe I within the channel E, substantially as described.

6. In a heater, the spiral channel E, arranged to receive the products of combustion at its upper end and to discharge the same at its lower end, in combination with the pipe I, passing through said channel, and with the ridges *e* within said channel for supporting the pipe I, as and for the purpose specified.

ROBERT M. DIXON.

Witnesses:

CHARLES G. M. THOMAS,
GUSTAV SCHNEPPÉ.