

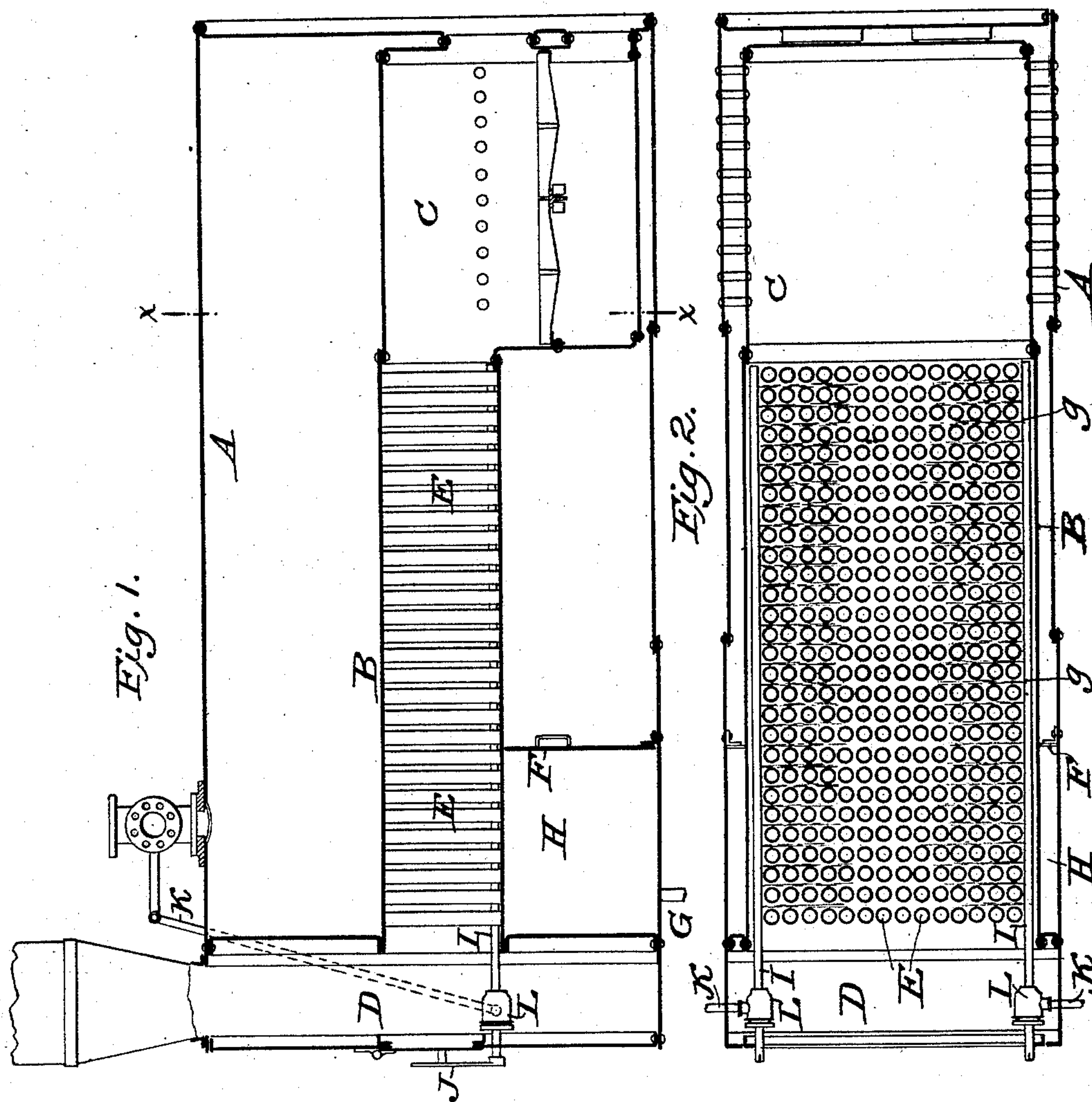
(No Model.)

2 Sheets—Sheet 1.

E. REYNOLDS.
STEAM BOILER.

No. 485,299.

Patented Nov. 1, 1892.



Witnesses:

James F. Duhamel
Horace A. Dodge.

EDWIN REYNOLDS,
Inventor,

by Dodget Lane,
Attys.

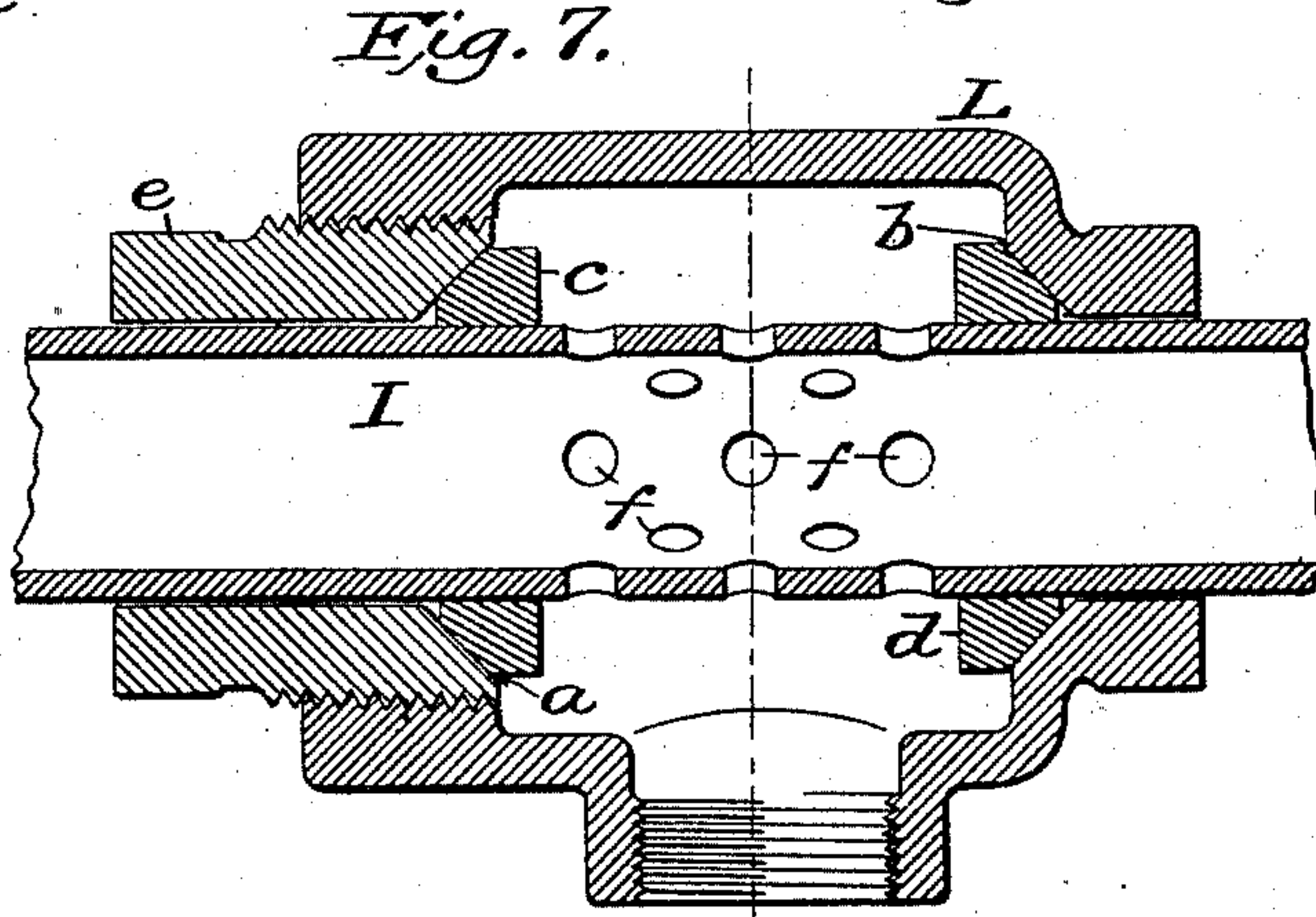
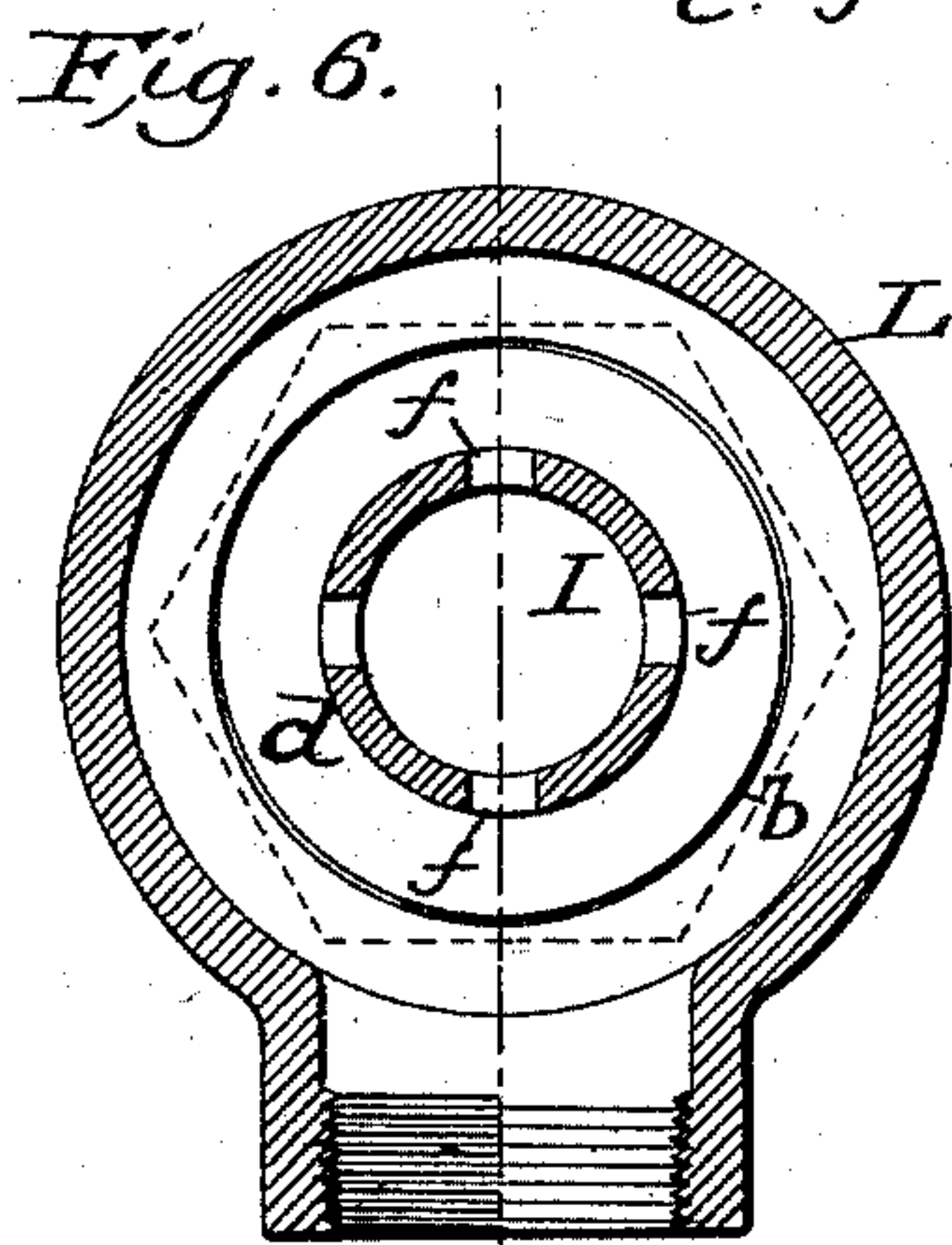
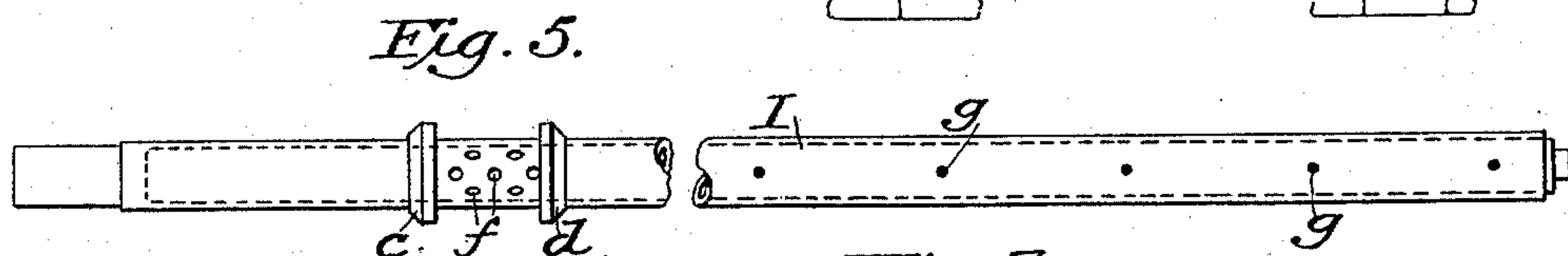
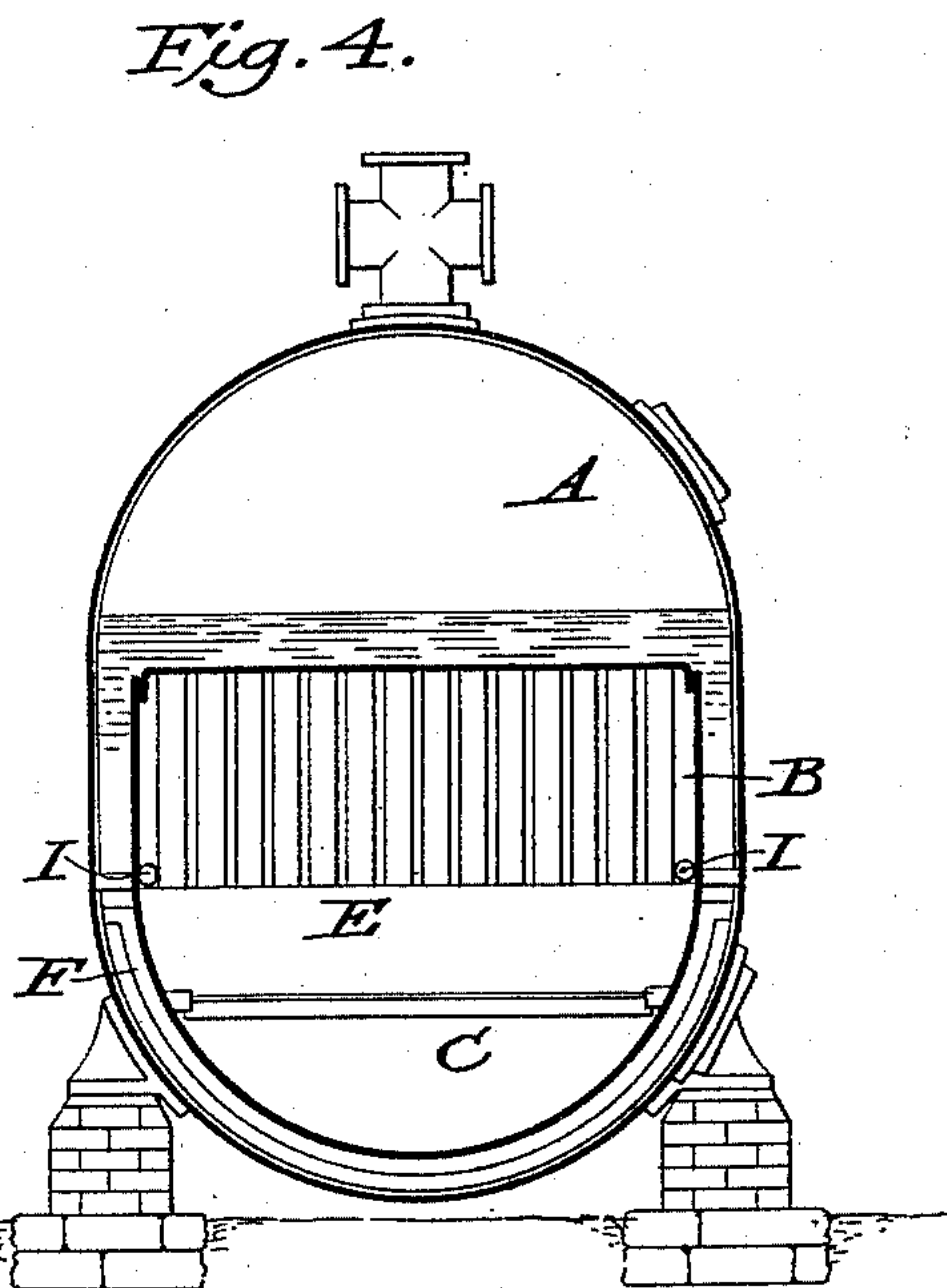
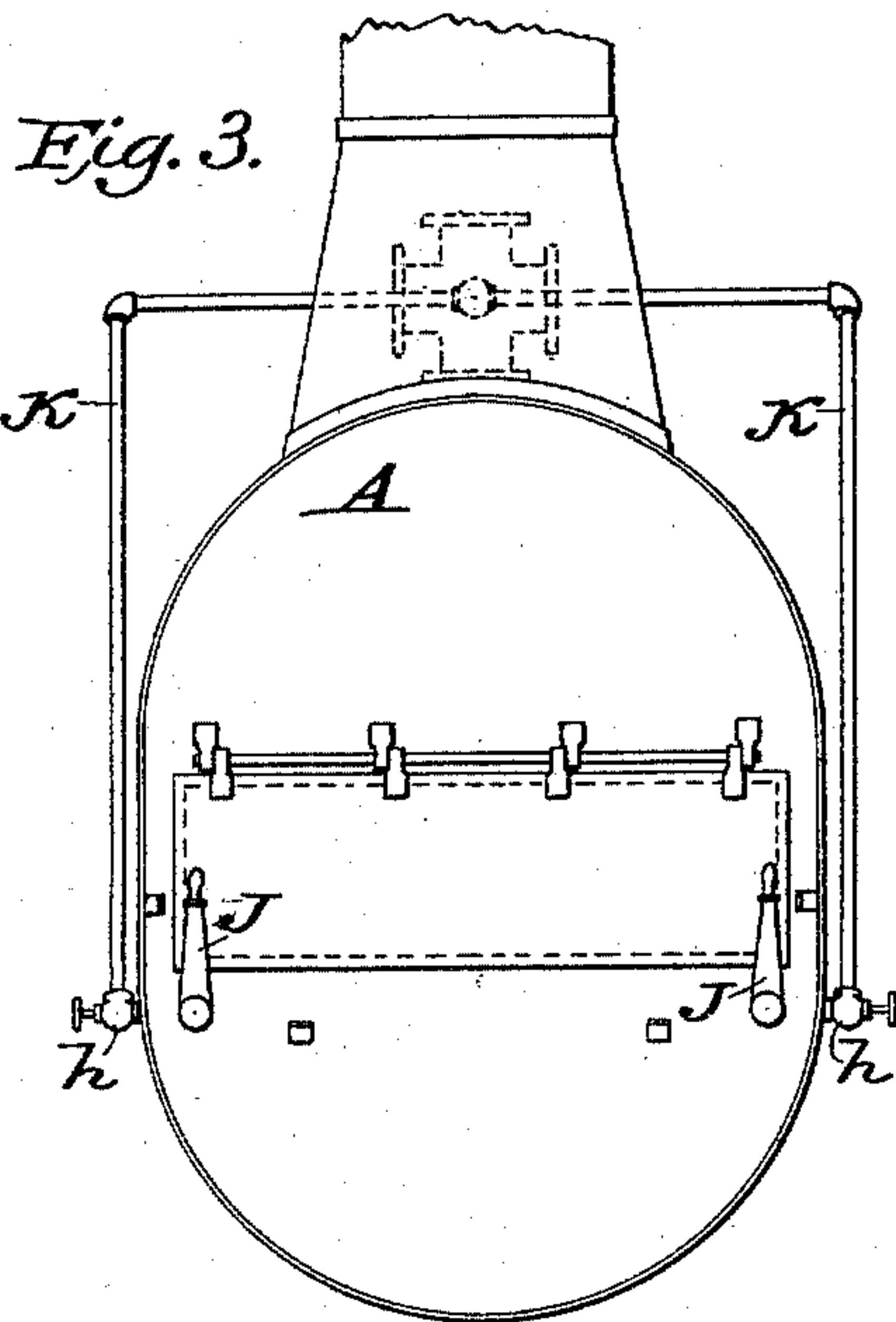
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UNITED STATES PATENT OFFICE.

EDWIN REYNOLDS, OF MILWAUKEE, WISCONSIN.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 485,299, dated November 1, 1892.

Application filed July 29, 1892. Serial No. 441,575. (No model.)

To all whom it may concern:

Be it known that I, EDWIN REYNOLDS, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Steam-Boilers, of which the following is a specification.

My invention relates to steam-boilers, and has reference more particularly to that class of boilers known as "water-tube" boilers.

In the drawings, Figure 1 is a vertical longitudinal sectional view of my improved boiler; Fig. 2, a horizontal sectional view of the same; Fig. 3, a front end view; Fig. 4, a vertical transverse sectional view on the line *x x*, and Figs. 5, 6, and 7 are views illustrating certain details hereinafter more particularly described.

The boiler-shell A is substantially elliptical or oval in cross-section—that is to say, it is semi-cylindrical at its upper and lower portions, while its intermediate side walls are flattened, as clearly shown in Figs. 3 and 4.

B indicates a rectangular flue extending from the fire-box or conducting-chamber C to the smoke-box D at the forward end. This rectangular flue B is provided with a series of upright water-tubes E, as shown in Figs. 1, 2, and 4.

F indicates a diaphragm or plate below the rectangular flue and at a short distance from the forward or front end of the latter, and into the space between this diaphragm and the front wall of the boiler the feed-water pipe G enters. From this construction it will be seen that the feed-water enters this compartment or chamber H at the forward end of the boiler and passes upward through the water-tubes where the temperature of the gases is the lowest, thus forming an economizer within the boiler. By using this diaphragm F in connection with the upright tubes I cause the water to pass upward through the latter to the top of the flue B, instead of taking the shorter diagonal course, as occurs where horizontal fire-tubes are employed. Upon reference to Figs. 1, 2, and 4 it will be seen that there are two pipes I, which rest upon the bottom wall or plate of the rectangular flue, in the corners of the latter. These pipes I are closed at the rear end and project out beyond the front of the boiler at the opposite

end, where they are each provided with a handle or lever J, as shown in Figs. 1 and 3.

K K indicate pipes extending from the steam-dome to a point between the smoke-box, where they are provided with or secured to a valve shell or casing L, which is shown in detail in Figs. 6 and 7. This shell or casing is provided with two valve-seats *a* and *b* to receive the valve-rings *c* and *d*, affixed to the pipes or tubes I, the valve-seat *a* being formed upon the inner end of the removable plug *e*, as clearly shown in Fig. 7. By removing the plug *e* the pipe I, with its valves *c* and *d*, may be withdrawn if it should for any reason become desirable so to do. The pipes I are provided at a point between the valves *c* and *d* with a series of holes or openings *f*, through which the steam entering the shell or casing L may find its way into the interior of the pipe. The steam that is admitted into the interior of the pipes I is discharged therefrom through suitable holes or openings *g*, which, as shown in Fig. 2, are arranged opposite the spaces between the water-tubes E. When it is desired to remove the soot or deposit from the outer surface of the water-tubes, it is only necessary to open the valves *h* in the pipe K and allow the steam to enter from said pipes K into the pipes I, the steam emitted from the pipes I being thrown, of course, from opposite sides of the boiler over the exposed surfaces of the water-tubes. By taking hold of the handles or levers J the pipes I may be turned or rotated axially, so as to insure the distribution of the steam upon the entire surface of the water-tubes.

It will be observed from the foregoing description that it is not necessary to open any part of the boiler to effect this cleansing of the water-tubes, which is carried on with the aid of the draft, the particles detached by the steam being carried by said draft into the forward compartment or smoke-chamber of the boiler. It will also be observed that no rubber hose or similar attachments are required and no opening of doors for the purpose of cleaning, which would obviously admit cold air and deaden the draft, besides lowering the steam-pressure and blowing more or less of the soot and ashes out into the fire-room.

While I have shown the boiler as provided

with two independent pipes I, I do not wish to be understood as restricting myself to this number, as it is obvious that more or less of such pipes may be used without departing
5 from my invention.

Having thus described my invention, what I claim is—

1. In combination with shell A, the flue B, the water-tubes disposed in an upright position and opening at opposite ends into the
10 spaces above and below the flue, and an upright diaphragm or plate beneath the flue, serving to direct the feed-water up through the upright tubes, all substantially as shown
15 and described.

2. In combination with boiler-shell A, flue B, and tubes E, the fixed casing L, provided with a steam-inlet pipe K, and the perforated pipe I, journaled in the shell or casing L and

having perforations *f* within the casing, all
20 substantially as shown and described.

3. In combination with shell or casing L, having a steam-inlet pipe K, and the valve-seats *a* and *b*, the oscillating pipe I, provided with the valves or valve-rings *c* and *d*.
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4. In combination with shell or casing L, provided with a steam-supply pipe K, and with the valve-seat *b*, the removable plug *e*, provided with the valve-seat *c*, and the perforated oscillating pipe I, provided with valves
30 or valve-rings *c* and *d*.

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

EDWIN REYNOLDS.

Witnesses:

W. M. RUTH,
T. N. BROWN.