

(No Model.)

B. VICTOR.  
FEED WATER HEATER.

No. 540,370.

Patented June 4, 1895.

Fig. 1.

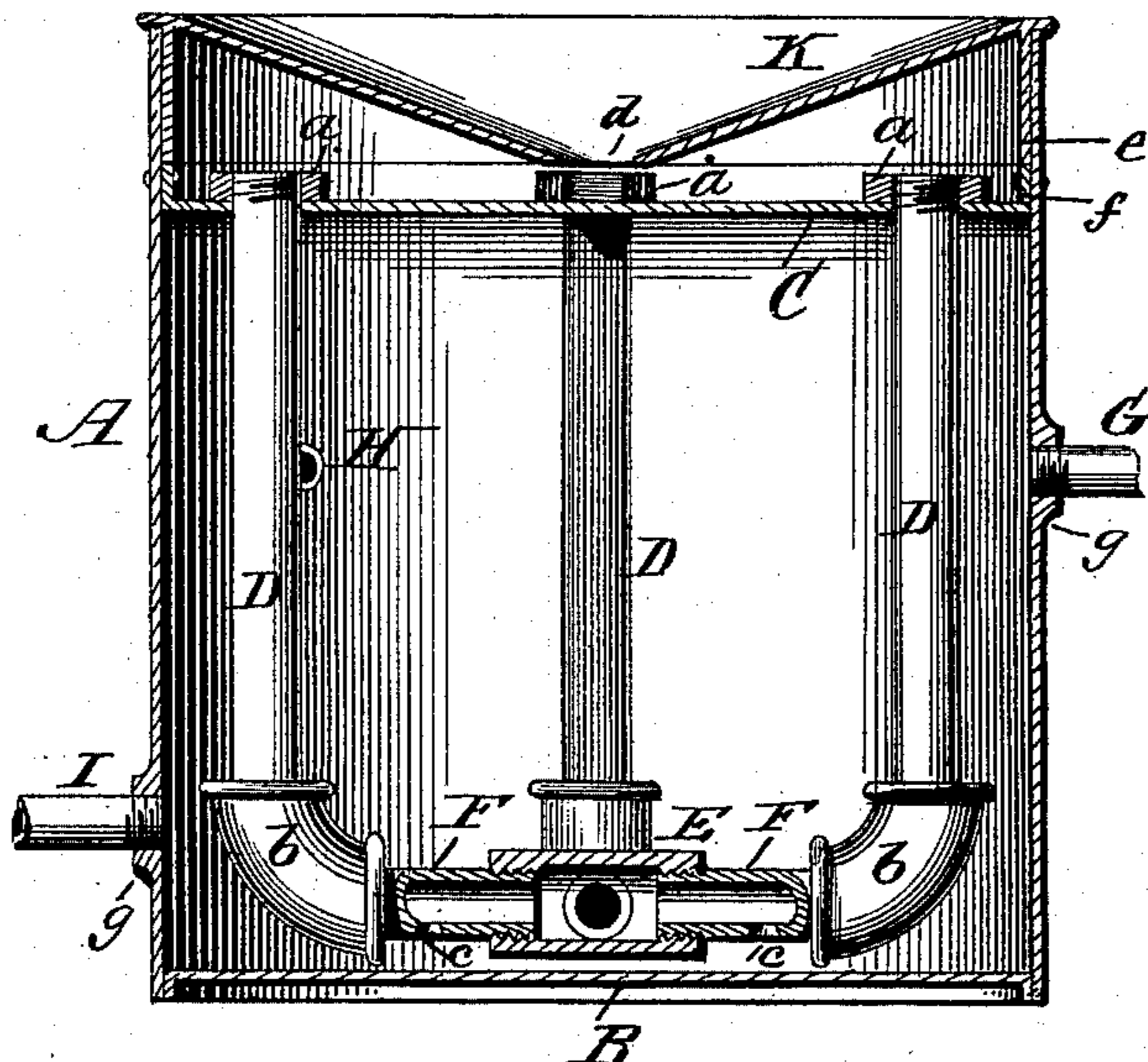


Fig. 2.

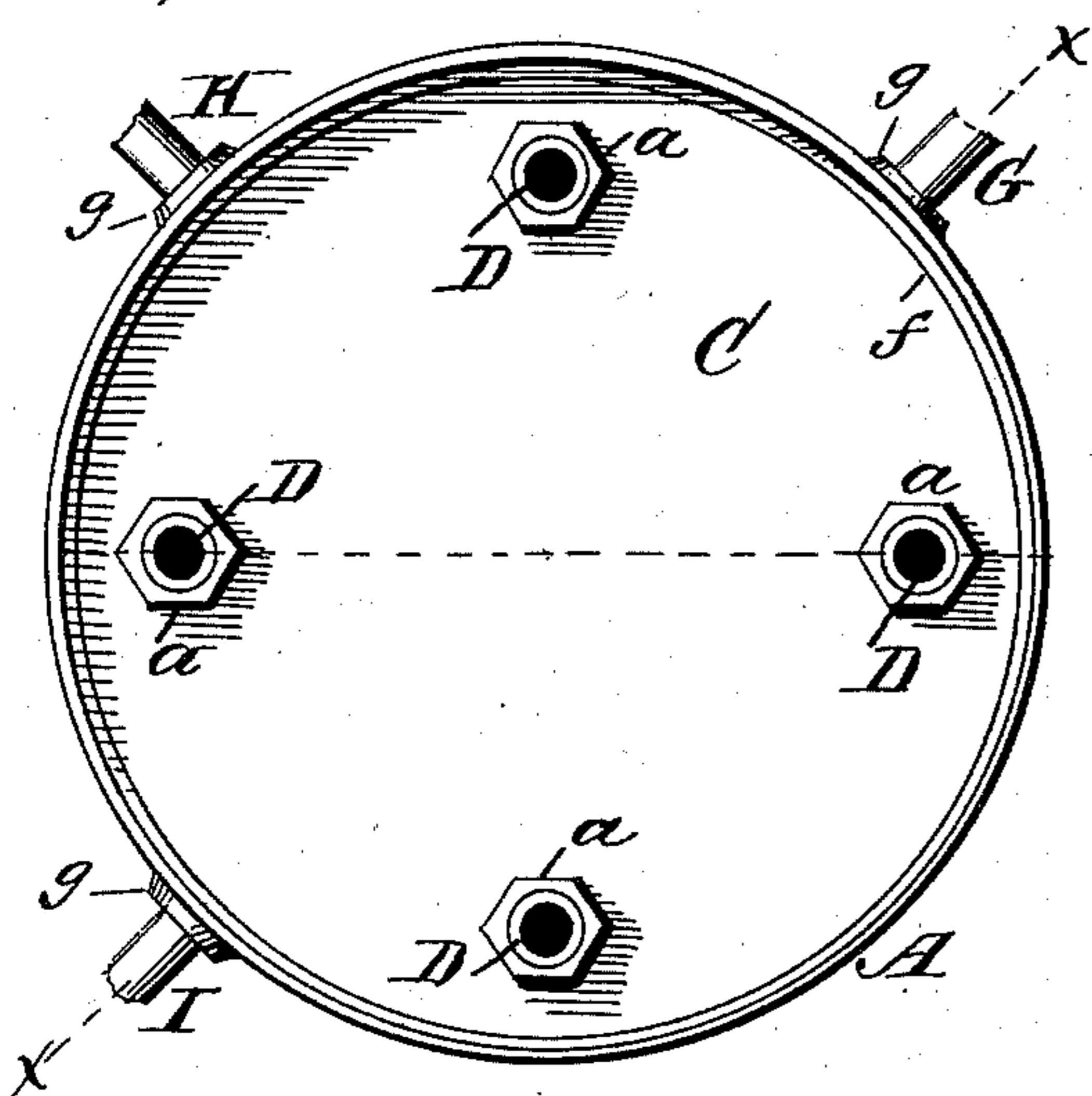
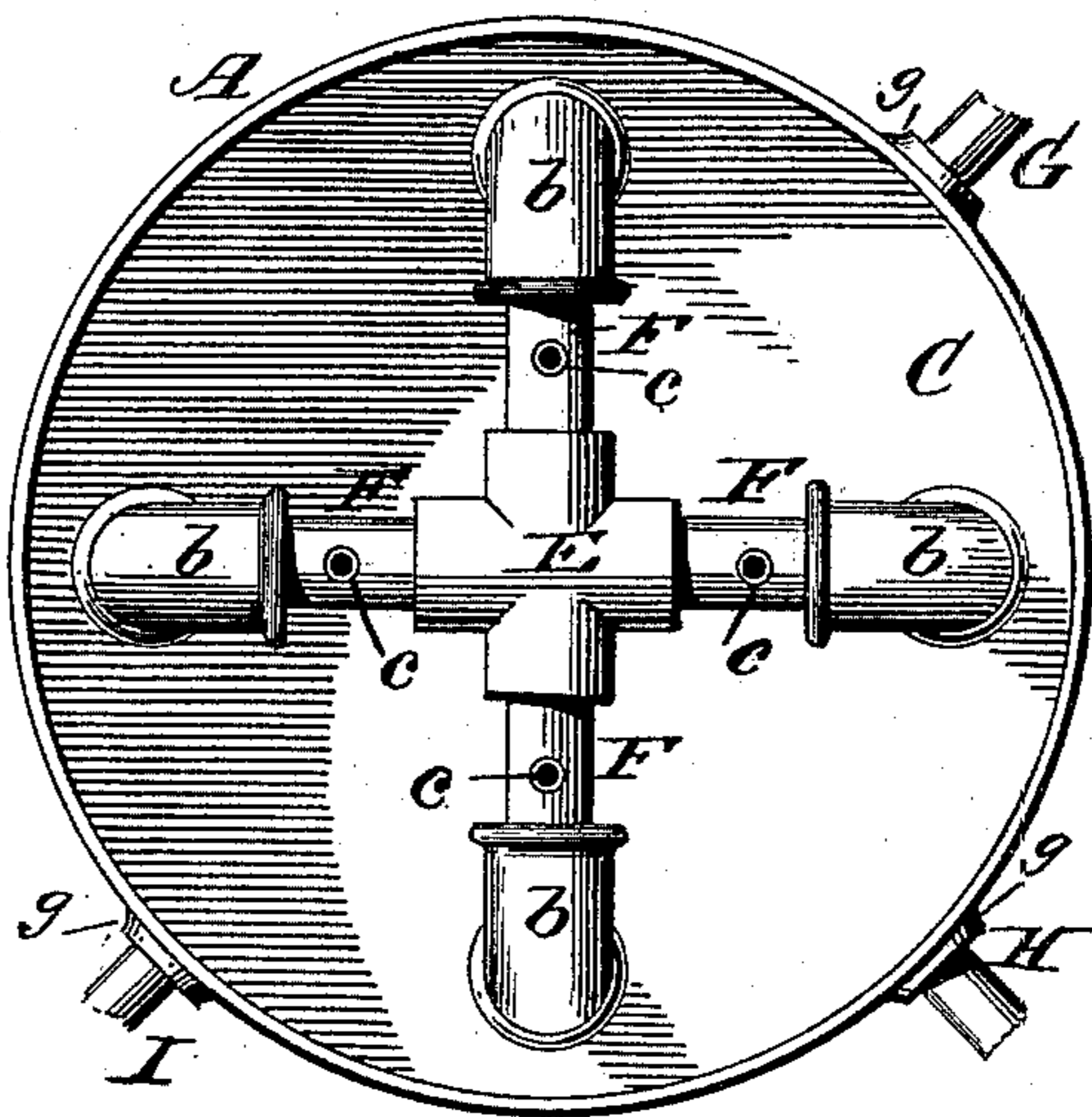


Fig. 3.



Witnesses  
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per Cha. H. Fowler  
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# UNITED STATES PATENT OFFICE.

BIRT VICTOR, OF HARPER, ILLINOIS.

## FEED-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 540,370, dated June 4, 1895.

Application filed March 29, 1895. Serial No. 543,697. (No model.)

*To all whom it may concern:*

Be it known that I, BIRT VICTOR, a citizen of the United States, residing at Harper, in the county of Ogle and State of Illinois, have  
5 invented certain new and useful Improvements in Feed-Water Heaters; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making  
10 a part of this specification, and to the letters of reference marked thereon.

The present invention has for its object to provide a feed water heater for steam boilers that will be simple in construction, effective  
15 in operation, and result in an economy of fuel when in use, and in many respects possessing advantages not obtained in the feed water heaters in ordinary use.

The invention consists in a feed water  
20 heater constructed substantially as shown in the drawings and hereinafter described and claimed.

Figure 1 of the drawings is a vertical section taken on line *x x* of Fig. 2; Fig. 2, a top  
25 plan view with the funnel-shaped top removed; Fig. 3, an under side plan view with the bottom removed.

In the accompanying drawings A represents the body or casing of the feed water  
30 heater provided with a suitable bottom B and at a short distance from the top of said body or casing is a diaphragm C, which diaphragm may be secured in place by any well known means or placed in the casing loosely and  
35 rest on supports projecting from the interior of the body or casing or be supported by the water tubes hereinafter described.

Suitable water-tubes D are located in the body or casing A and project up through the  
40 diaphragm C, any number of said tubes being employed as found most desirable, but in the present instance there are four of these tubes shown. These tubes may be secured to the diaphragm by having upon the ends  
45 which project above the diaphragm suitable screw threads with which engage nuts *a*, or any other well known means may be employed as found best adapted to the purpose.

The water tubes D extend down into and  
50 partly across the lower end of the body or casing A and near the bottom thereof and diverge to a common center, said tubes being

provided with elbows *b*, which are connected in the present instance to a four-way coupling E by means of the tubes F, which tubes  
55 have one or more holes or openings *c*.

An inlet pipe G connects with the interior of the body or casing A at a point below the diaphragm C for the exhaust steam from the engine or from any other source, and at the  
60 opposite side of the body or casing on about the same horizontal plane, is an outlet pipe H which communicates with the interior of the body or casing and is for the exhaust steam that is not condensed.

Communicating with the interior of the body or casing A near the bottom thereof is the pipe I for drawing off the hot water to feed to the boiler.

The top K of the body or casing A is funnel shaped with a central opening *d*, said funnel having circumferential flange *e* of sufficient height to rest upon the flange *f* of the diaphragm C and elevate the central opening above and from contact therewith.

The operation is as follows: Water from  
75 any source sufficient to keep the body or casing A properly filled, is permitted to run into the funnel shaped top K and through the central opening *d* thereof and thence onto the diaphragm C, where it rises to the ends of the tubes D and flows gradually into the same and passes down said tubes and out through the holes or openings *c* into the body or casing, after which it is drawn off through the  
80 pipe I. The level of the water in the body or casing A is retained slightly above the outlet pipe I so that between the water and diaphragm C is formed an exhaust steam chamber which is supplied with steam from the  
85 pipe G, the escape pipe H preventing any pressure in the chamber. It will be seen that the water is first heated as it slowly runs over the diaphragm C and again as it passes through the water tubes D where it is de-  
90 posited in the bottom of the body or casing for use.

Any well known and desirable means may be employed for connecting the various pipes with the body or casing, although in the present instance there is shown screw nipples *g*  
100 with which the screw threaded ends of the pipes engage, as being one of many means that may be employed.

A heater constructed as herein described is very efficient especially when it is provided with any well known boiler covering for retaining the temperature in the heated water.

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

1. In a feed water heater, the combination  
10 of the body or casing provided with a diaphragm near the top thereof, with water-tubes extending down and converging to a common center, and a coupling in common for all the  
15 water-tubes, said water tubes being provided with holes on their converging sides, which communicate with the interior of the casing, whereby the water of condensation and the heated feed water commingle, substantially  
20 as and for the purpose specified.

2. In a feed water heater, the combination  
20 of the body or casing provided with a diaphragm near the top thereof, with water tubes

extending downwardly therefrom, and a funnel shaped top located over the diaphragm and having a central opening, substantially  
25 as and for the purpose described.

3. In a feed water heater, the combination  
30 of the casing provided with a diaphragm near the top thereof, an exhaust steam inlet and outlet, a water outlet, with the water tubes extending down and converging to a common center and provided with openings on their  
35 lower converging sides, and a funnel shaped top located over the diaphragm and having a central opening, substantially as and for the purpose set forth.

In testimony that I claim the above I have hereunto subscribed my name in the presence  
of two witnesses.

BIRT VICTOR.

Witnesses:

COLLIN L. ROBERTSON,  
FRANK WERTZ.