(No Model.)

J. PARK.

FEED WATER HEATER.

No. 289,929. Patented Dec. 11, 1883.

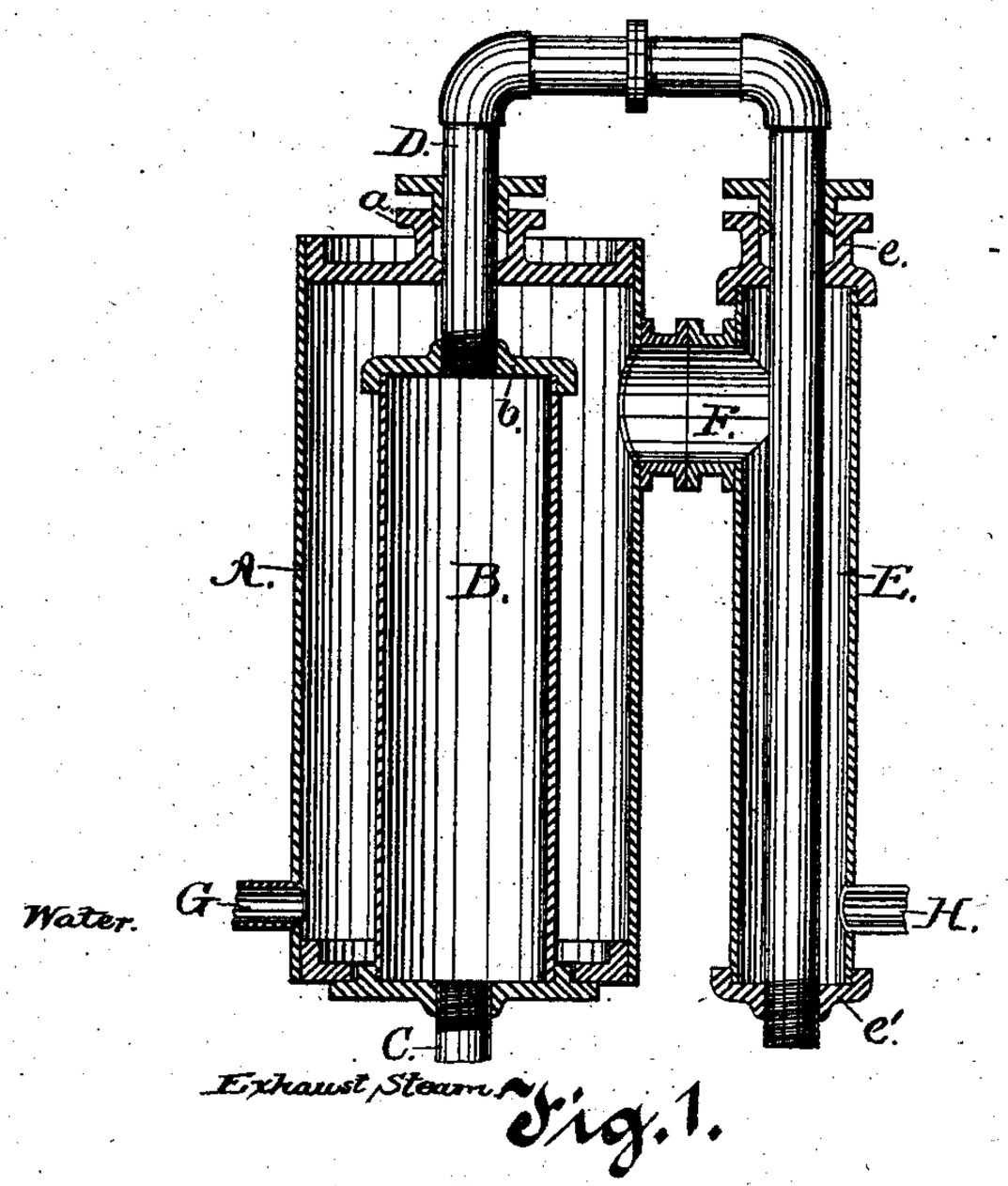

Fig. 1.

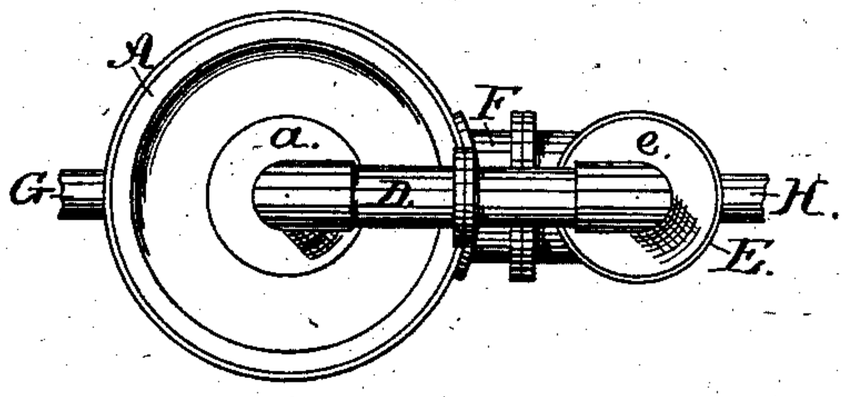

Fig. 2.

Witnesses.

C. J. Mattison.

A Low

Inventor.

James Park

by

William H. Low

Attorney.

UNITED STATES PATENT OFFICE.

JAMES PARK, OF TROY, NEW YORK, ASSIGNOR TO THEODORE E. HASLEHURST, OF SAME PLACE.

FEED-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 289,929, dated December 11, 1883.

Application filed April 23, 1883. (No model.)

To all whom it may concern:

Be it known that I, JAMES PARK, of Troy, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Feed-Water Heaters, of which the following is a specification.

My invention relates to improvements in devices for heating feed-water for steam-boilers and other similar purposes; and it consists in combining with a main or principal heater an auxiliary chamber connected to one side of the main heater and a continuous line of steam-pipe passing through the central axes of the main heater and auxiliary chamber, the whole being so constructed and combined that water fed into the main heater will, after passing therethrough in contact with the steam-heating chambers and pipes, flow into the auxiliary chamber, and, after absorbing additional heat from the steam-pipe in the latter, be discharged from the apparatus in a highly-heated condition.

The object of my improvement is to provide an apparatus for heating water by means of currents of either live or exhaust steam in an effective and economical manner. This object I attain by means of the mechanism illustrated in the accompanying drawings, which form part of this specification, and in which—

Figure 1 is a vertical section of my invention, and Fig. 2 an end view of the same.

As represented in the drawings, A is the main or principal cylinder of the heater; B, a steam retarding and expansion chamber contained within the cylinder A and secured to one head thereof, the said chamber being adapted to permit the steam to expand therein, for the purpose of retarding the velocity of its flow and permitting it to impart its heat to the body of water surrounding said chamber in a more perfect manner than can be effected by means of a continuous pipe of uniform diameter passing through a water-containing chamber.

C is an inlet steam-pipe for furnishing steam to the chamber B; D, an outlet steam-pipe for conveying steam from the chamber B. The said pipe is connected to the head *b* of the steam-chamber, and, after passing out of the cylinder A through a stuffing-box, *a*, formed in one of the heads of said cylinder, is reverted to pass through the auxiliary cylinder.

E is the auxiliary heating-cylinder, connected to one side and near one end of the cylinder A by means of the water-pipe F. An extension of the steam-pipe D passes through a stuffing-box, *e*, formed in one head of the cylinder E, and, extending through the latter, passes out through the opposite head, *e'*.

G is an inlet water-pipe secured to the cylinder A, and near the end of the latter that is most distant from the pipe F, for the purpose of compelling the water that is fed into the cylinder A to pass through the entire length of said cylinder before it can escape therefrom; H, an outlet water-pipe connected to the end of the cylinder E that is the farthermost from the pipe F, for the purpose of forcing the water to pass through the entire length of the auxiliary cylinder before it can pass out of the heater.

By means of the stuffing-boxes *a* and *e* provision is made for any difference in expansion between the external cylinders, A and E, and the steam-chamber B and outlet-pipe D.

By means of the steam retarding and expanding chamber B the surrounding feed-water is brought into direct contact with a large area of heat-conducting metal, which incloses a large volume of steam that is retained in a sluggish condition, and is consequently in a better state to impart its heat to the feed-water that surrounds said chamber.

The operation of my improved heater is as follows: Steam, either directly from the boiler or from the exhaust-pipe of an engine, is admitted into the chamber B through the inlet steam-pipe C, and is therein expanded so as to increase its volume and decrease the velocity, and, by reason of its greatly-increased radiating-surface, making the apparatus more effective in its operation. The steam, after imparting a portion of its heat to the water surrounding the said chamber, passes out therefrom through the outlet-pipe D, and in passing through the said pipe it imparts additional heat to the water in the auxiliary chamber E. Water is fed into the lower end of the principal cylinder A, and from thence it passes upward in contact with the steam-

chamber B and pipe D, then passes through the pipe F into the auxiliary chamber E, where it is kept in contact with the steam-pipe D until it is discharged from the heater through the outlet water-pipe H in a highly-heated condition.

I am aware that feed-water heaters have been constructed with a continuous steam-pipe of uniform diameter that was passed in a reverted direction through a larger water-pipe containing corresponding bends; and I am also aware that two counterpart heaters of the Berryman class, containing bent steam-pipes, have been connected together so as to operate alternately but not conjointly; but none of said heaters have contained the steam retarding and expanding chamber which constitutes the essential feature of my improvement, and for that reason I do not claim such constructions; but

I claim as my invention—

The combination, with a main heater, A, containing a steam retarding and expansion chamber, B, and an auxiliary heater, E, connected to the heater A by means of the pipe F, in the manner herein shown and described, of the outlet steam-pipe D, connected to the chamber B and passing out of the heater A and through the heater E, in the manner herein set forth, all being constructed and arranged to operate as and for the purpose herein specified.

JAS. PARK.

Witnesses:

WILLIAM H. LOW,

EDWIN G. DAY.