

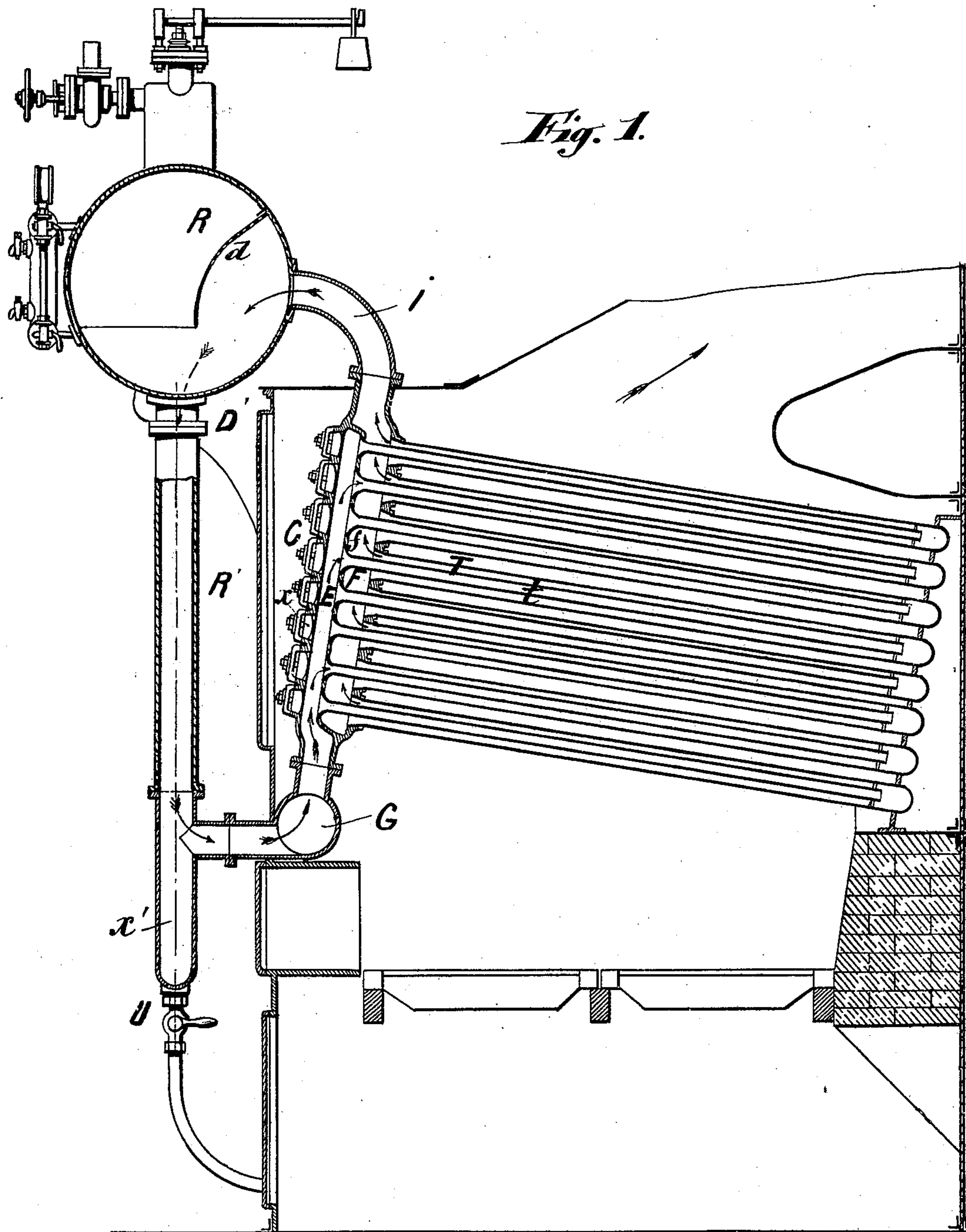
No. 644,362.

Patented Feb. 27, 1900.

J. MAZIÈRES.
WATER TUBE BOILER.
(Application filed Apr. 28, 1898.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:

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J. Buehler.

Inventor,

Jean Mazières
by B. Singer
Att'y.

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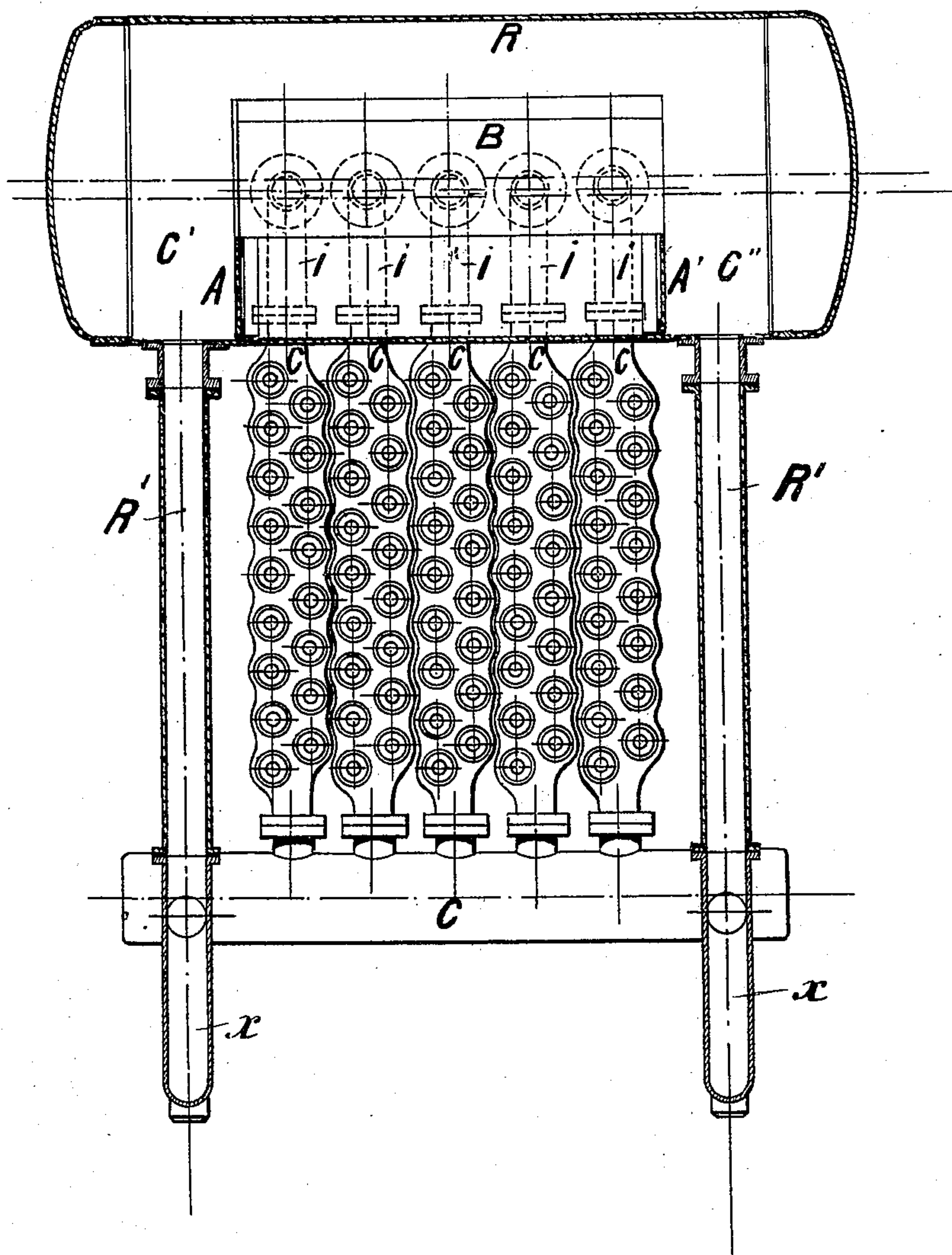
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Fig. 2.



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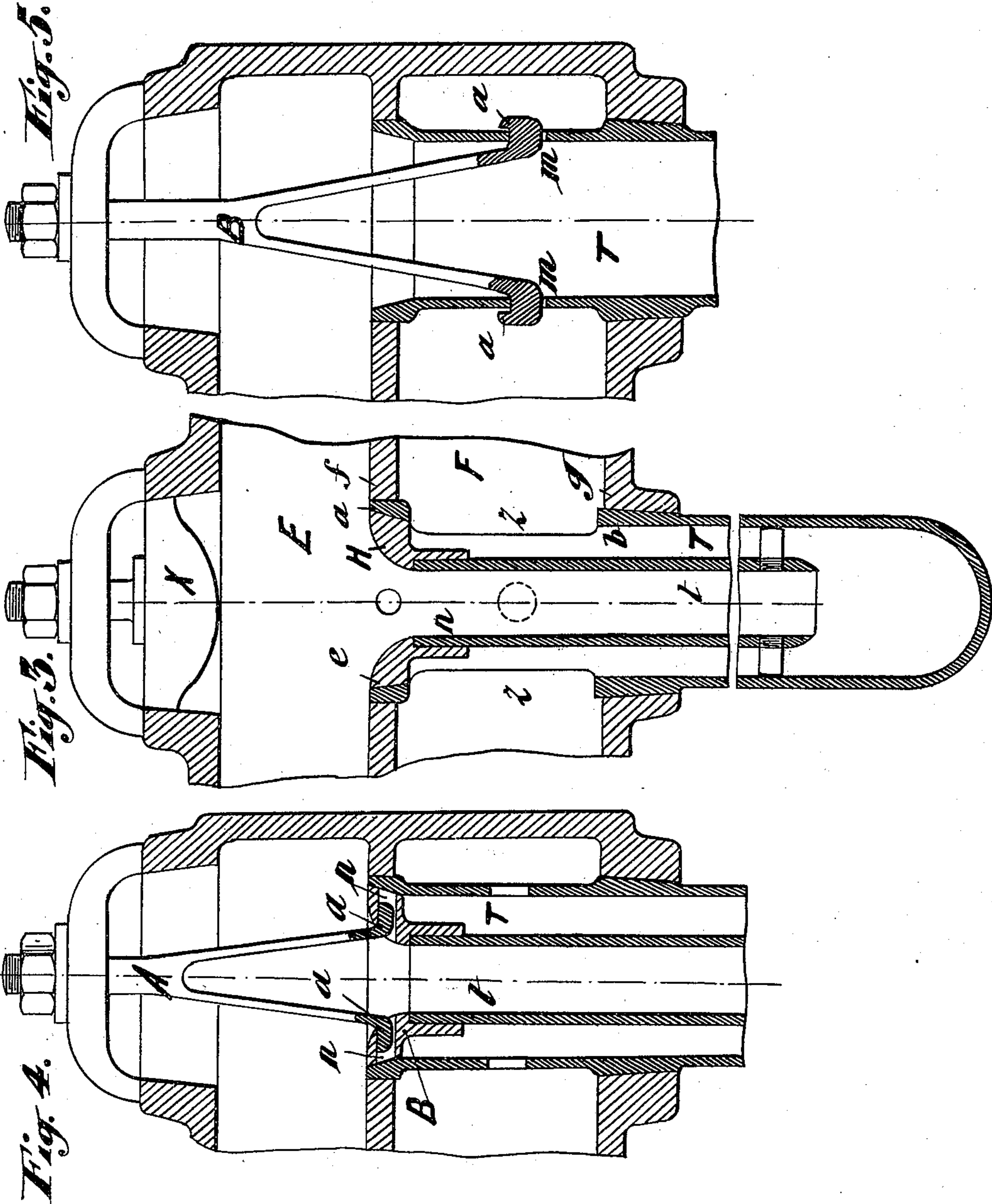
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UNITED STATES PATENT OFFICE.

JEAN MAZIÈRES, OF BORDEAUX, FRANCE.

WATER-TUBE BOILER.

SPECIFICATION forming part of Letters Patent No. 644,362, dated February 27, 1900.

Application filed April 28, 1898. Serial No. 679,128. (No model.)

To all whom it may concern:

Be it known that I, JEAN MAZIÈRES, a citizen of the Republic of France, residing at Bordeaux, France, have invented certain new and useful Improvements in Water-Tube Boilers, of which the following is a specification.

In the annexed drawings, Figure 1 is a vertical sectional view of the boiler. Fig. 2 is a section taken on the axis of the steam-drum and of the downward-circulation tubes. It shows also a front view of the steaming parts and the horizontal distributing-drum, the casing and details being removed. Fig. 3 is a section showing the method of securing the steaming-tubes and the inner feed-pipes to the vertical receiver. Fig. 4 shows the means employed to remove the inner feed-pipe. Fig. 5 shows the means employed to remove the inner steaming-tube.

In Figs. 1 and 2 the outer parts of the boiler, the parts of the safety-feed, and priming and purging devices of the grate and of the furnace, as in all boilers, are as follows: The steam and water drum R is placed in front of the face of the boiler and parallel to it. It is supported by two brackets D' and is outside the furnace and protected from contact with the gas produced by combustion. It is also separated from the steaming elements C, with which it is only in communication by the pipes R' and I. It is divided into three compartments by the partitions A A'. In the central part B discharge the tubes I of the steaming elements. In the two end compartments C' C'' are the water-ports of the downward-circulation tubes R'. This division of the steam and water drum into compartments is intended, first, to avoid by means of a diaphragm d and partitions A A' all ebullition of water in the compartments C' C''. Furthermore, as the feeding occurs in the central compartment B the deposits from the feed-water are precipitated there and cannot pass on account of the partitions A A' into the compartments C' C'' of the water-holes of the pipes R'. From these arrangements it follows that all deposits are left in the central compartment B, whence they can be removed by inner cleaning or purging. The compartments C' C'' receive no deposits nor any downward circulation of water and steam

from the tubes I. Thus no carrying of deposits into the steaming-tubes need be feared. The cleanliness also of the steaming-tubes is constantly insured.

The diaphragm d, pierced with small holes, is intended to prevent jets of water from the water and steam holes of the tubes I of the steaming elements. It serves at the same time to separate the water and the steam.

The pipes R' for downward circulation communicate with the distributing-drum G. At the lower part of these pipes are arranged small deposit-collectors x', in which are received the deposits which may have passed over the partitions A A'.

V is a purging-cock or clearance-valve.

On the distributing-drum G are fixed, by means of flanges and bolts, the vertical collectors from the Field's-tube steaming elements. These vertical collectors are composed of two compartments E and F, separated by a partition f, of steaming-tubes T, and of feed-pipes t, slightly inclined, and of closings x for examination for removing or mounting tubes. The number of steaming elements, as well as the number of tubes composing these steaming elements, is variable, according to the quantity of steam to be produced. At their upper part the vertical collectors are secured to the steam-drum R with flanges and bolts by the pipes I. These pipes lead the mixture of water and steam from the steaming elements to the steam-drum R. These tubes, according to the uses made of the boiler, may discharge either at the water-level or above it or below it.

The cycle of the circulation of the water is constituted as follows: The water from the steaming-drum R passes through pipes R', then enters into the horizontal distributing-drum G, is distributed by this distributing-drum into the compartments E of the vertical collectors, passes through the inner tubes t, and returns into the annular space between the tubes T t. In this return circulation it is subjected to the heat of the furnace and becomes steam in great part. In this state it arrives in the compartment F and passes in a state of mixed steam and water through the pipe I to discharge into the steam-drum R, where the diaphragm d separates the water from the steam.

It can be seen by the above description that the water leaving the steam-drum R follows the direction indicated by the arrows and returns to the steam-drum through the tubes I with a speed increasing with the decrease of the density of the mixture of water and steam which flows through said tubes I. This speed is thus proportioned to the production of steam or to the intensity of the heat.

The feed by the horizontal distributing-drum G of the steaming elements secures the normal feed of the steam-tubes in proportion to their distance from the grate. It follows from this arrangement that, however intense the heating may be, the lower tubes are fed first and with a quantity corresponding to the produced steam. The upper steam-tubes, producing less steam, are also fed in proportion to their steam production.

In Fig. 3, E is the compartment receiving the water; F, the upward-circulation compartments; X, the self-closings; T, the steaming-tube; *t*, the inner feed-pipe. The following is the way in which the steaming-tube T is fixed: At its end are two rings *a* and *b*. The ring *a*, of cylindrical form, is located in an orifice in the partition *f*. The ring *b*, of conical form, is located in a conical hole of the wall *g*. The inner pressure supported by the tube presses the ring *b* on the conical part of the wall or partition *g* and forms thus a tight metal joint. The inner tube *t* carries on its end a ring H, adjusted by means of a conical part *e* within the tube T in front of the ring *a*. The end *n* of tube *t* is chucked or dudgeoned into the ring H. The other end carries centering-blocks. The tube T is open at Z above and below to allow the mixed water and steam to pass into the compartments F.

In Fig. 4 is indicated the means used to remove the inner tube *t*. The self-closing being removed, a two-spring-armed rod B is introduced carrying on the end two little heads *a*, which are located in the holes *n* of the ring B of the inner tube. Then the cross-bar of the self-closing is fixed and the nut thereof screwed on. With the least effort the ring *b* leaves the tube T, and the said tube *t* is only to be removed by hand.

In Fig. 5 is shown the means employed to remove the steaming-tube T. The self-closing being removed, a rod B is introduced having two spring branches and carrying on the end two little heads *a*, which are placed in the holes *m* of the tube. Then the cross-bar of the self-closing is placed and the nut is

screwed until the tube leaves its conical adjustment. Afterward the tube can be removed by hand.

The tubes are mounted as follows: The tube T is first placed in position. It is pushed in until rings *a* and *b*, Fig. 3, are adjusted in their places. Then strike lightly on ring *a* until the tube is firm in its conical adjustment. The inner feed-tube is then introduced. It suffices to strike lightly in order to fix the ring *a* in the conical part of the end of tube T.

I reserve to myself the right of using all suitable materials for construction of these boilers and to vary the forms and arrangements entirely or in part, according to the uses which may be made of them in future.

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

1. In water-tube boilers, the combination with suitable inlet-pipe, of a steam-drum divided into compartments by partitions, outlet-pipes leading from said drum and communicating with a distributing-drum, collecting-pipes communicating with said latter drum, a plurality of tubes communicating with the collecting-pipes, and return-pipes leading from said tubes to the steam-drum first named, substantially as set forth.

2. In water-tube boilers, the combination with a suitable inlet-pipe, of a steam-drum having plain and perforated partitions therein whereby the drum is divided into compartments, outlet-pipes leading from one of said compartments, a distributing-drum communicating with said outlet-pipes, vertically-arranged collecting-pipes communicating with said distributing-drum, a plurality of boiler-tubes communicating with said collecting-pipes, return-pipes communicating with said boiler-tubes and with the discharge-compartments of the steam-drum, substantially as set forth.

3. In water-tube boilers, the combination of a distributing-drum, collecting-pipes connected with said drum, and a plurality of boiler-tubes communicating with said collecting-pipes each of said tubes being composed of an outer pipe and an inner pipe, having wedge-like bearings and provided with perforations, and means for removing said pipes from their bearings, substantially as set forth.

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Witnesses:

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