(No Model.)

F. J. KORTE.

BOILER.

No. 348,918. Patented Sept. 7, 1886.

Fig. 1.

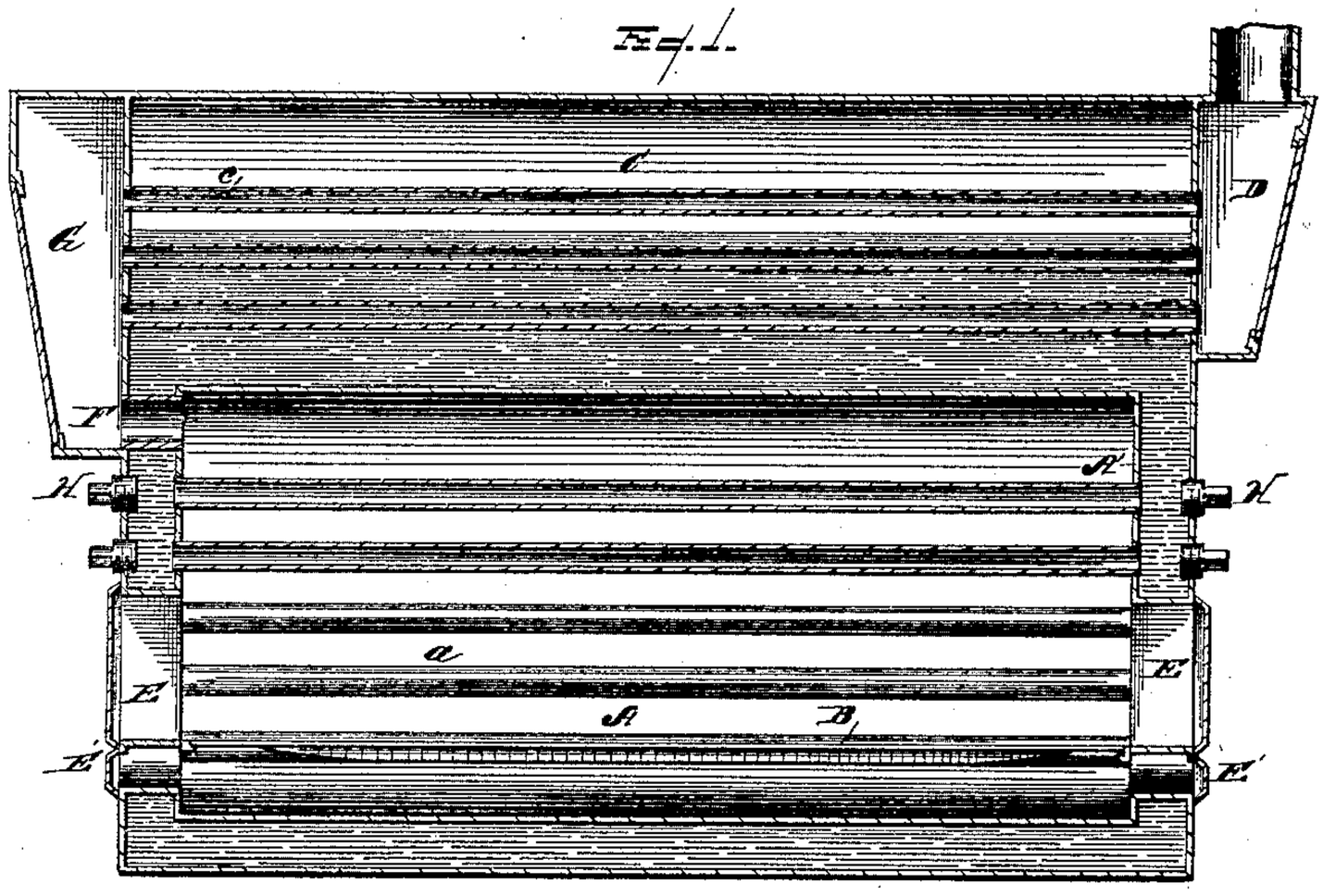
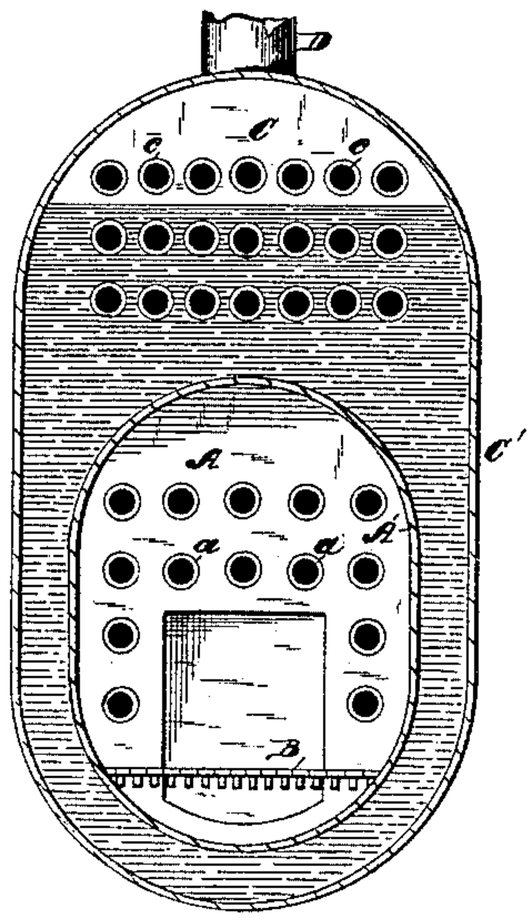


Fig. 2.



WITNESSES

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FRANK J. KORTE, OF ZANESVILLE, OHIO.

BOILER.

SPECIFICATION forming part of Letters Patent No. 348,918, dated September 7, 1886.

Application filed January 25, 1886. Serial No. 189,658. (No model.)

To all whom it may concern:

Be it known that I, FRANK J. KORTE, of Zanesville, county of Muskingum, State of Ohio, have invented a new and useful Improvement in Boilers; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object certain new and useful improvements in boilers, as more fully hereinafter described, and more particularly pointed out in the claims.

My invention, consists, chiefly in the combination, with a horizontal boiler constructed with flues for the passage of the products of combustion in the ordinary manner, of a furnace extending nearly or quite the full length of the boiler, the furnace being provided with water-pipes located therein, around which the products of combustion pass on their way to the flues in the boiler, the boiler itself extending downward, so as to partially or entirely inclose the furnace, thus effecting a most complete utilization of the heat, and enabling steam to be raised in the most expeditious manner.

My invention also contemplates the location of removable plugs in the boiler-case outside the water-pipes in the furnace, to facilitate their removal and cleansing.

I carry out my invention as follows: In the drawings, Figure 1 is a vertical longitudinal section of a device embodying my invention, and Fig. 2 is a vertical cross-section of the same.

In these figures, A represents a combustion-chamber or furnace. B is the grate; C, the boiler provided with a series of flues, *c*, through which the products of combustion may pass to the uptake D, in the usual manner. The boiler is arranged, preferably, to extend down along the sides of the combustion-chamber, as shown, in the form of a water-jacket, extending also downward about each end of the combustion-chamber, as shown in Fig. 1, provision being made for the feeding and draft doors, E E′, and for a neck, F, whereby the combustion-chamber communicates with a smoke-box, G, to afford ready passage for the products of combustion from the combustion-chamber to the entrance of the boiler-flues *c*. I prefer that the combustion-chamber should extend the full length of the boiler, with the exception of the water-jackets at the ends. As so constructed the furnace may be fired at either end.

a represents a series of tubes located in the combustion-chamber, communicating with the boiler at their ends, and through which the water circulates. I have shown these water-pipes located horizontally in the furnace; but I would have it understood that they may extend in any other direction in the combustion-chamber, if desired, as I do not limit myself to their horizontal location. I prefer, also, to construct the fire-box of the furnace of an elliptical form in cross-section, or nearly so, the tube and bottom of the inclosing-case A′ being rounded. So, also, I prefer to construct the boiler-case C′ of a similar form, rounded at top and bottom.

H represents a series of plugs movably engaged with the shell of the water course or jacket, adjacent to the ends of the water-tubes *a*. This outside plate can be tapped and the plugs inserted, so that in case any tubes need to be replaced or repaired it can be readily done at either orifice in the plate and the flues cleansed.

The drawings show the water courses or jackets extending downward beneath the fire-box so as to form a water-jacket, affording a general circulation all over and around the fire-box and through the boiler. I do not confine myself to such extension of the water-jackets beneath the fire-box, as the boiler could be made with an open fire-box below, or with an air-chamber below, in place of the water-bottom, without departing from the main principles of my invention.

The operation of the device will now be understood. The heat upon the water-tubes *a* causes the water to circulate through the same and through the water-ways around the fire-box, thus assisting very materially in making steam quickly, effecting a saving in fuel, as well as in the time of making steam. As the fire-box preferably extends the full length of the boiler its heat is utilized very thoroughly in its contact with the sheet or case inclosing the combustion-chamber, the products of combustion returning to the uptake through the flues *c*.

By constructing the boiler in the shape herein mentioned as preferred—viz., with rounded top and base—I am enabled to get more fire-room than in case a round boiler should be used. The boiler may be readily extended vertically, also, to give increased space for the fire-box and for flue-room. I do not, however, limit myself solely to a boiler of this form. So, also, the top or bottom of fire-box can be flat, and the shell of the boiler also be made square at the base to form the water-bottom.

What I claim is—

1. The combination, with a boiler having a smoke-box at one end and an uptake at the other end and flues extending through the boiler and connecting said smoke-box and uptake, of a fire-box extending nearly the entire length of the boiler, said fire-box having a neck, F, through which it communicates with the smoke-box, and being provided with water-pipes that communicate with the boiler, substantially as described.

2. The combination, with a boiler having a smoke-box and uptake at opposite ends connected by flues, of a fire-box extending the entire length of the boiler and communicating with the smoke-box, said fire-box having doors and draft-openings at both ends and being provided with water-pipes that communicate with the boiler, substantially as described.

3. The combination, with the boiler provided with flues, of the fire-box A, consisting of a shell, A′, located in the water-space of the boiler and surrounded by the water, the said shell being provided with doors E E′, neck F, and water-pipes *a*, and the boiler-jacket being provided with removable plugs H, arranged opposite the ends of the water-pipes *a*, substantially as described, and for the purpose specified.

4. The combination, with a boiler rounded at top and bottom, of a fire-box rounded at the base and top, said boiler provided with flues and said fire-box with water-pipes, the construction being such that the products of combustion may pass around the water-pipes and return to the uptake through said flues, substantially as described.

5. The combination, with a boiler extended over the combustion-chamber to constitute a water-jacket, of a fire-box, said fire-box provided with water-pipes communicating with said water-jacket, substantially as described.

6. The combination, with a fire-box, of a boiler extended over the combustion-chamber of the fire-box to form a water-jacket, said fire-box extended the whole length of the boiler between the legs of the jacket and provided with water-tubes communicating with said jacket, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

FRANK J. KORTE.

Witnesses:
A. LYNN,
S. A. BOGUE.