J. E. FERNSTRUM.

STEAM BOILER.

APPLICATION FILED AUG. 7, 1908.

981,078.

Patented Jan. 10, 1911.

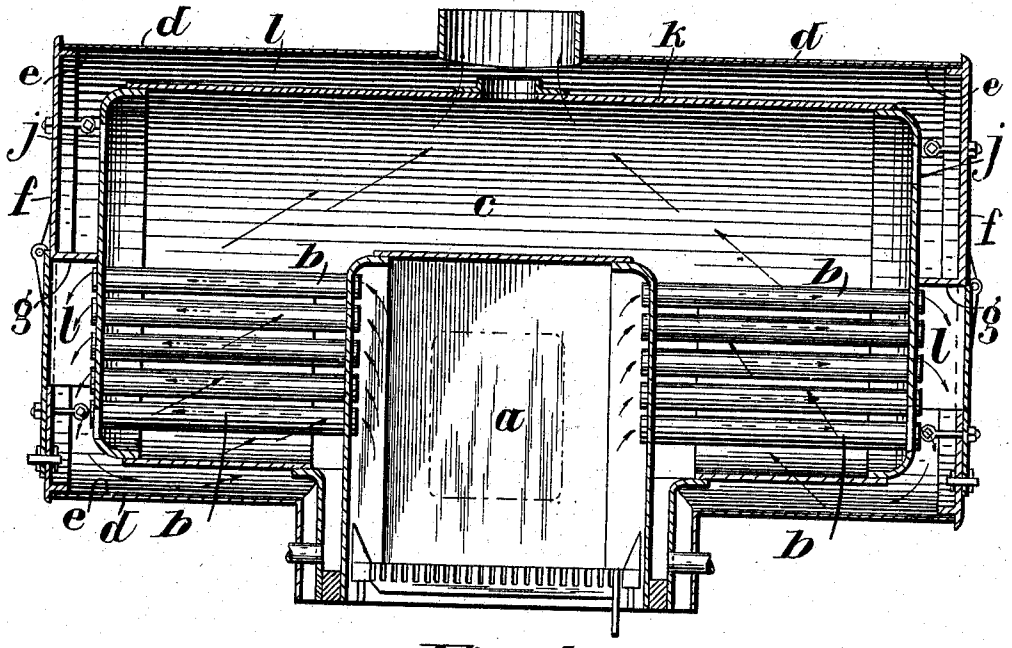

Fig. 1.

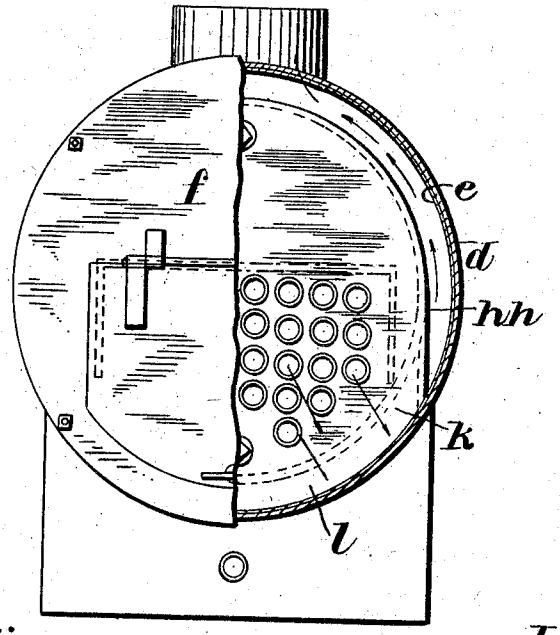

Fig. 2.

Witnesses:

Frank D. Church

John R. Stephenson

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UNITED STATES PATENT OFFICE.

JOHN E. FERNSTRUM, OF MENOMINEE, MICHIGAN.

STEAM-BOILER.

981,078. Specification of Letters Patent. Patented Jan. 10, 1911.

Application filed August 7, 1908. Serial No. 447,494.

To all whom it may concern:

Be it known that I, JOHN E. FERNSTRUM, a citizen of the United States, residing at Menominee, in the county of Menominee and State of Michigan, have invented a new and useful Steam-Boiler, of which the following is a specification.

My invention relates to improvements in steam-boilers having fire tubes, and the objects of my invention are, first: to generate steam quickly; second, to cheapen the cost of producing steam power, and of steam heating. I attain these objects as illustrated in the accompanying drawing, in which—

Figure 1, is a vertical section of the entire boiler and jacket; Fig. 2, is an end view of the boiler and jacket as it appears after removing the flue cap.

Similar letters refer to similar parts throughout the several views.

The standard, the fire-pot *a*, the tubes *b*, and the boilers *c*, are not materially different from steam boilers now in common use except that the fire pot *a*, is in the middle of the length of the boiler instead of at the end. The tubes *b*, lead from the fire pot *a*, to the right through the boiler *c*, and to the left through the boiler *c* equally each side being a counterpart of the other. A jacket *d*, lined with asbestos *e*, envelops the boiler *c*, at such distance from the boiler *c*, as to permit a free draft of heat between the lining *e*, of the jacket *d*, and the boiler *c*.

Attached to the inside of the flue cap *f*, or end plate of the jacket *d*, is a flange *g*, of sufficient length to extend across the space on the end *j*, of the boiler *c*, over the boiler tubes, and having two arms *h h*, at right angles to itself, extending downward on each side and of sufficient length to reach from the flange *g*, to a point where their respective ends would be in a continuous line with the shell *k*, of the boiler *c*. The flue cap *f*, should be detachably attached to the end of the jacket *d*, preferably by bolts and nuts, and when so attached the flange *g*, reaches entirely across the air space *l*, between the end of the boiler *j*, and the flue cap *f*, in such a manner as to entirely obstruct and prevent the flow and draft of heat upward, and over the top of the boiler *c*, on its way to the chimney or stack and to force it under and across the boiler *c*, then along the sides of the boiler *c* to the chimney or stack.

The above description refers to both ends or halves of the boiler, being counterparts. The placing of the fire-pot *a*, at the center and having the two divisions (to the right and to the left of the fire-pot *a*) counterparts of each other, permits the use of shorter tubes, and affords intenser heat than can be obtained by placing the fire-pot *a*, at one end of the boiler *c*, and using longer tubes.

I am aware that prior to my invention steam boilers have been made having fire-tubes. I do not therefore, claim the combination broadly but

What I do claim as my invention is:

1. The combination, in a jacketed steam boiler having two sets of tubes each set running in an opposite direction from the fire-pot to two air chambers situated at each end of the boiler, of the said tubes and air chambers with two flanges having arms extending downward, one attached to the inside of each flue cap and extending therefrom across the air chamber to the ends of the boiler, above and at each side of the openings of the tubes, whereby the products of combustion are caused to take the course described in their passage from the furnace to the chimney outlet, substantially as herein set forth.

2. In a jacketed steam boiler, the combination (at each end of the boiler) of a flue cap detachably attached to the end of the outer shell of the boiler and having two flanges with arms extending downward in such a way that when the flue caps are adjusted to their respective ends of the boiler the flanges with their respective arms will extend all the way across the air chambers from the flue caps to the end of the boiler, above and at each side of the openings of the flues, substantially as described.

3. A flue cap consisting of the plate or cap proper and a flange with arms at either end, extending downward in such a way that when the flue cap is adjusted to its place on either end of the boiler, the flange with the arms will extend all the way across the space, from the flue cap to the end of the boilers, substantially as described.

4. The combination, in a steam boiler, of a central fire-pot and two sets of tubes, running in opposite directions from the fire-pot to two air chambers, with two flue caps having flanges with arms extending downward attached to the inside thereof in such a way that, when the flue caps are adjusted to their respective ends of the boiler, the

flanges with their respective arms will extend all the way across the air chambers from the flue caps to the ends of the boiler above and at each side of the flue openings, an asbestos lined jacket to which is detachably attached flue caps as described in this claim, and the necessary flue for the escape of the refuse of combustion.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

J. E. FERNSTRUM.

Witnesses:
FRANK ERDLITZ,
JOHN G. REINDL.