

No. 699,888.

Patented May 13, 1902.

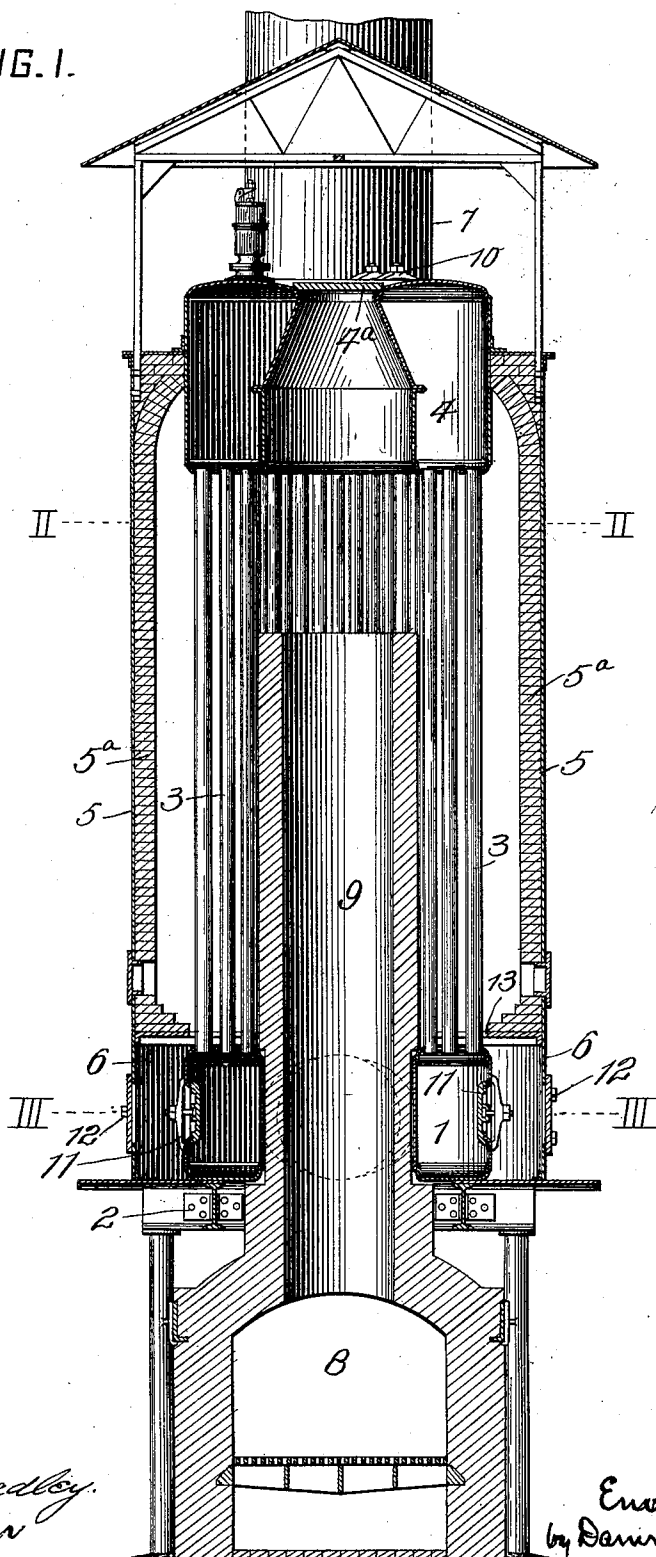
E. L. MOORE.
BOILER.

(Application filed Aug. 16, 1900. Renewed Feb. 6, 1902.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 1.



WITNESSES:

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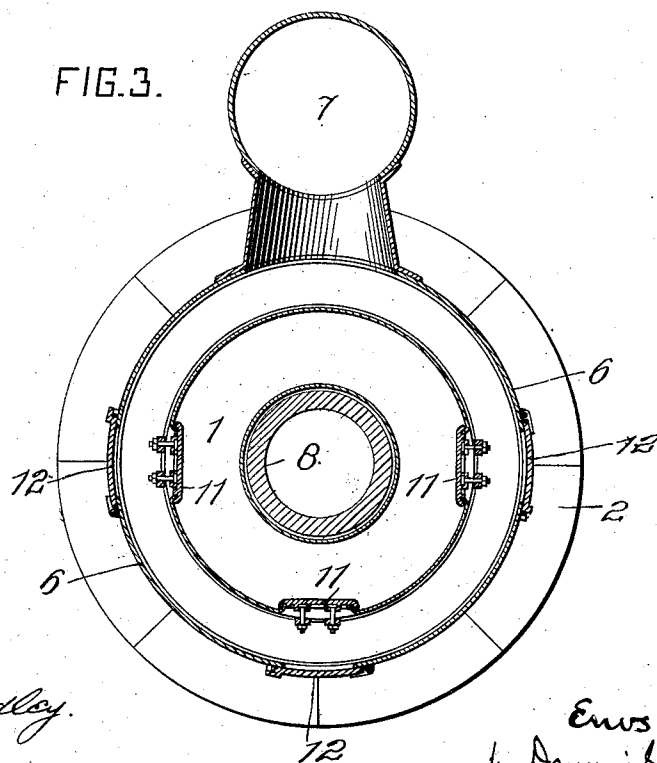
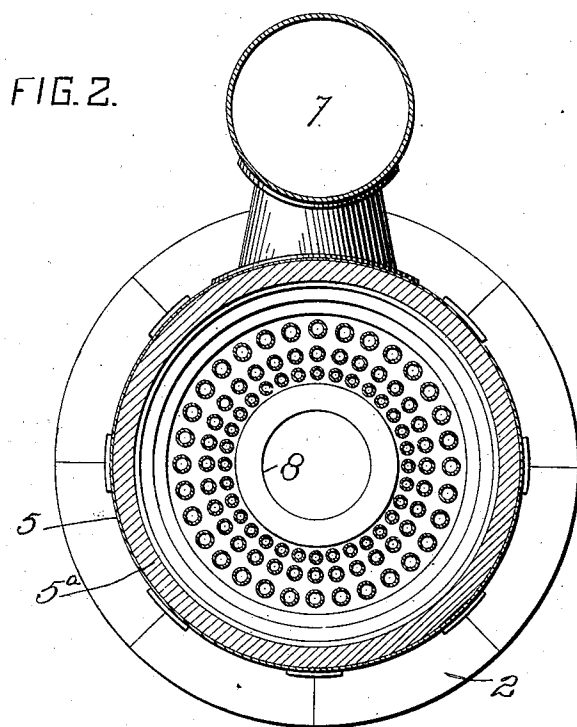
Patented May 13, 1902.

E. L. MOORE.
BOILER.

(Application filed Aug. 16, 1900. Renewed Feb. 5, 1902.)

(No Model.)

2 Sheets—Sheet 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

ENOS L. MOORE, OF CHICAGO, ILLINOIS.

BOILER.

SPECIFICATION forming part of Letters Patent No. 699,888, dated May 13, 1902.

Application filed August 16, 1900. Renewed February 5, 1902. Serial No. 92,728. (No model.)

To all whom it may concern:

Be it known that I, ENOS L. MOORE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented or discovered certain new and useful Improvements in Boilers, of which improvements the following is a specification.

The invention described herein relates to certain improvements in vertical water-tube boilers, and has for its object a construction and arrangement of boiler and fire-box whereby the gases and products of combustion are caused to pass through a combustion-chamber within the boiler proper, so that the gases may be thoroughly ignited before they are brought into contact with the heating-surfaces of the boiler.

It is also an object of the invention to provide for an equal distribution and initial application of the products of combustion to the boiler at a plane near the top of the boiler, where the highest heat prevails, and then causing the products of combustion to flow down along the tubes.

It is a further object of the invention to so construct the setting for the boiler that the several parts thereof shall be free to expand and contract independently of each other, thereby avoiding the formation of cracks, which will admit cold air.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a sectional elevation of my improved boiler; and Figs. 2 and 3 are sectional plan views on planes indicated by the lines II II and III III, respectively, Fig. 1.

In the practice of my invention the lower portion or member of the boiler is formed by an annular drum 1, which is supported upon a frame 2 at a suitable height from the ground. From the top wall of this drum extends a series of tubes 3, which at their upper ends are connected to an annular drum 4. It is preferred that the central opening through this upper drum 4 should be contracted, as shown, thereby increasing and strengthening the internal heating-surface of the drum. This central opening is closed by a plate 4^a, formed of any suitable refractory material. The drums 1 and 4, with their connecting-tubes 3,

are inclosed in a casing consisting of an external metal shell 5 and an internal lining of brick and extending from a point near the upper end of the upper drum down to or approximately to the top of the lower drum, as shown in Fig. 1. Said casing is made sufficiently large to afford a passage around the tubes. The lower drum 1 is preferably inclosed by a metal shell 6, which extends from the lower end of the casing-shell 5 down to the platform 2, although the casing-wall itself may, if desired, extend down to the platform. The stack 7 is connected, as shown in Figs. 1 and 3, to this lower shell 6.

The fire-chamber 8 is constructed and arranged immediately below the lower annular drum, and from this fire-chamber extends a tubular wall 9, which passes up through the lower drum to a point a little below the upper drum. The products of combustion and gases pass from the fire-chamber up into this tubular chamber, where the gases become thoroughly ignited, and thence pass outwardly from the end of the tubular passage between the tubes 3, connecting the upper and lower drums, and down along such tubes to the chamber surrounding the lower drum, whence they pass to the stack. In order to prevent the products of combustion being drawn to the side to which the stack is connected, the inner wall of the casing or shell 5 is contracted at or near the upper end of the lower drum, forming an annular throat 14, having an area or delivering capacity approximately equal to that of the stack or chimney. This construction affords ample opportunity for any foreign material to be precipitated and settle down into the lower drum. Access is had to the upper and lower drums through manholes 10 and 11, formed, respectively, in the top surface of the upper drum and the side wall of the lower drum. Doors 12 are also formed in the sides of the casing 6 to permit access to the manholes 11 and also to permit of the cleaning of the chamber around the lower drum.

It will be observed that the boiler and its inclosing shell are supported independently of each other by the platform 2 and that the roof covering the boiler is supported by the inclosing casing or shell, the posts 13 being bolted or riveted to the external metallic por-

tion of the casing. This construction permits of the movement of the boiler proper during contraction and expansion independent of the inclosing shell and also independent of the internal tubular combustion-chamber.

I claim herein as my invention—

1. The combination of a boiler consisting of an upper drum, an annular lower drum and tubes connecting said drums, a fire-chamber, a combustion-chamber extending from the fire-chamber through the lower drum and up between the tubes toward the upper drum and an inclosing casing or shell having its upper end closed and its lower end connected to the stack, substantially as set forth.

2. The combination of a boiler consisting of upper and lower drums and vertical tubes connecting said drums, a metal shell inclosing the drums and tubes, and a protecting-roof arranged above the boiler and supported by the metal shell, substantially as set forth.

3. In a boiler the combination of a boiler consisting of an upper drum and an annular lower drum and tubes connecting said drums,

a fire-chamber, an annular combustion-chamber extending from the fire-chamber through the lower drum and up between the tubes toward the upper drum and an inclosing casing having its lower end connected to the stack and provided with a contracted throat above the point of connection with the stack, substantially as set forth.

4. The combination of a boiler consisting of an upper drum, an annular lower drum and tubes connecting said drums, a fire-chamber located below the lower drum, an annular combustion-chamber extending from the fire-chamber up through the lower drum and between the tubes to a plane adjacent to the upper drum and an inclosing case or shell having its lower end connected to the stack, substantially as set forth.

In testimony whereof I have hereunto set my hand.

ENOS I. MOORE.

Witnesses:

CLIFFORD B. ANDERSON,
JNO. M. MOORE.