

No. 887,880.

PATENTED MAY 19, 1908.

L. S. WATRES.
STEAM BOILER.

APPLICATION FILED FEB. 23, 1906.

Fig. 1.

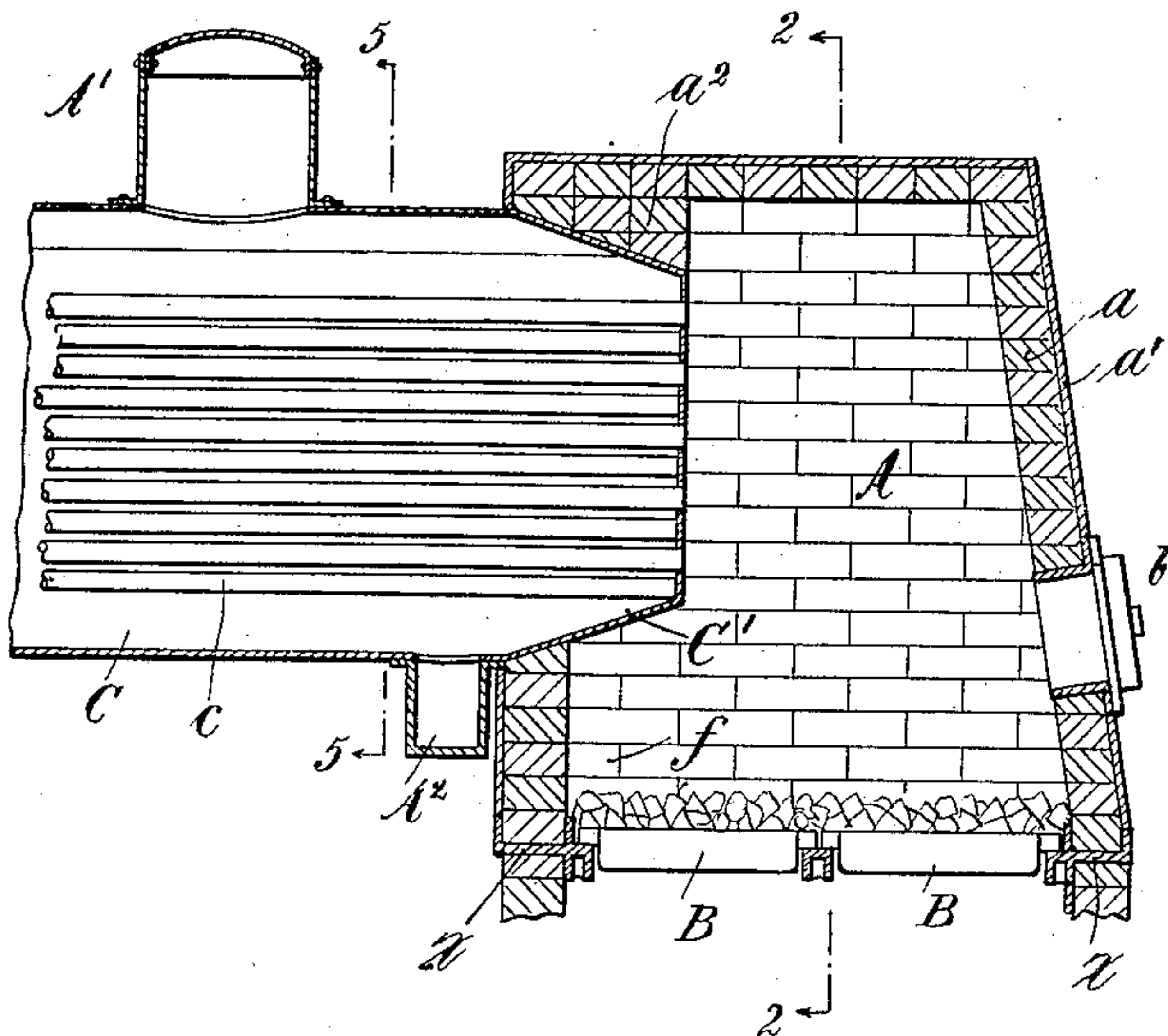


Fig. 2.

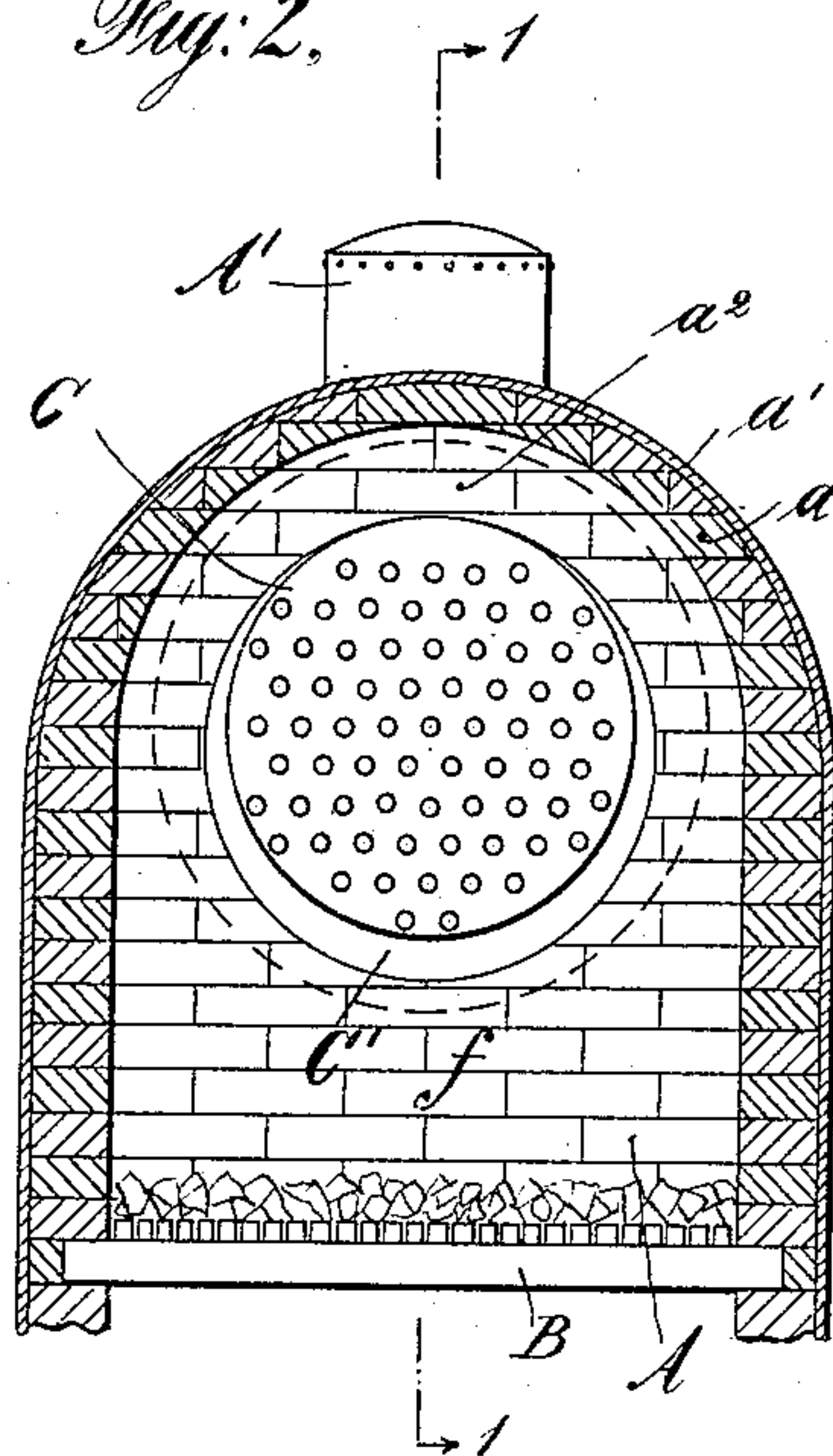


Fig. 3.

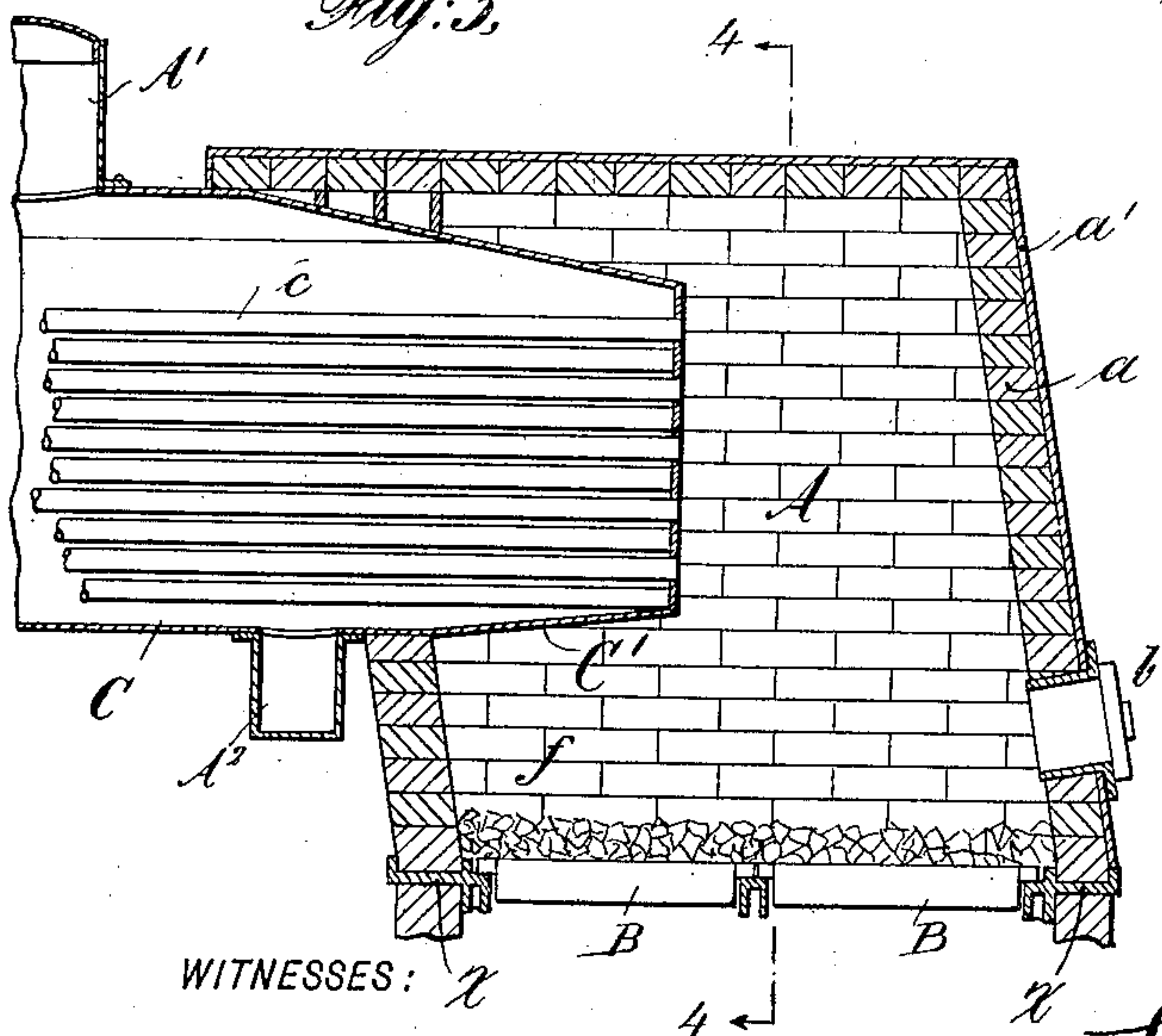
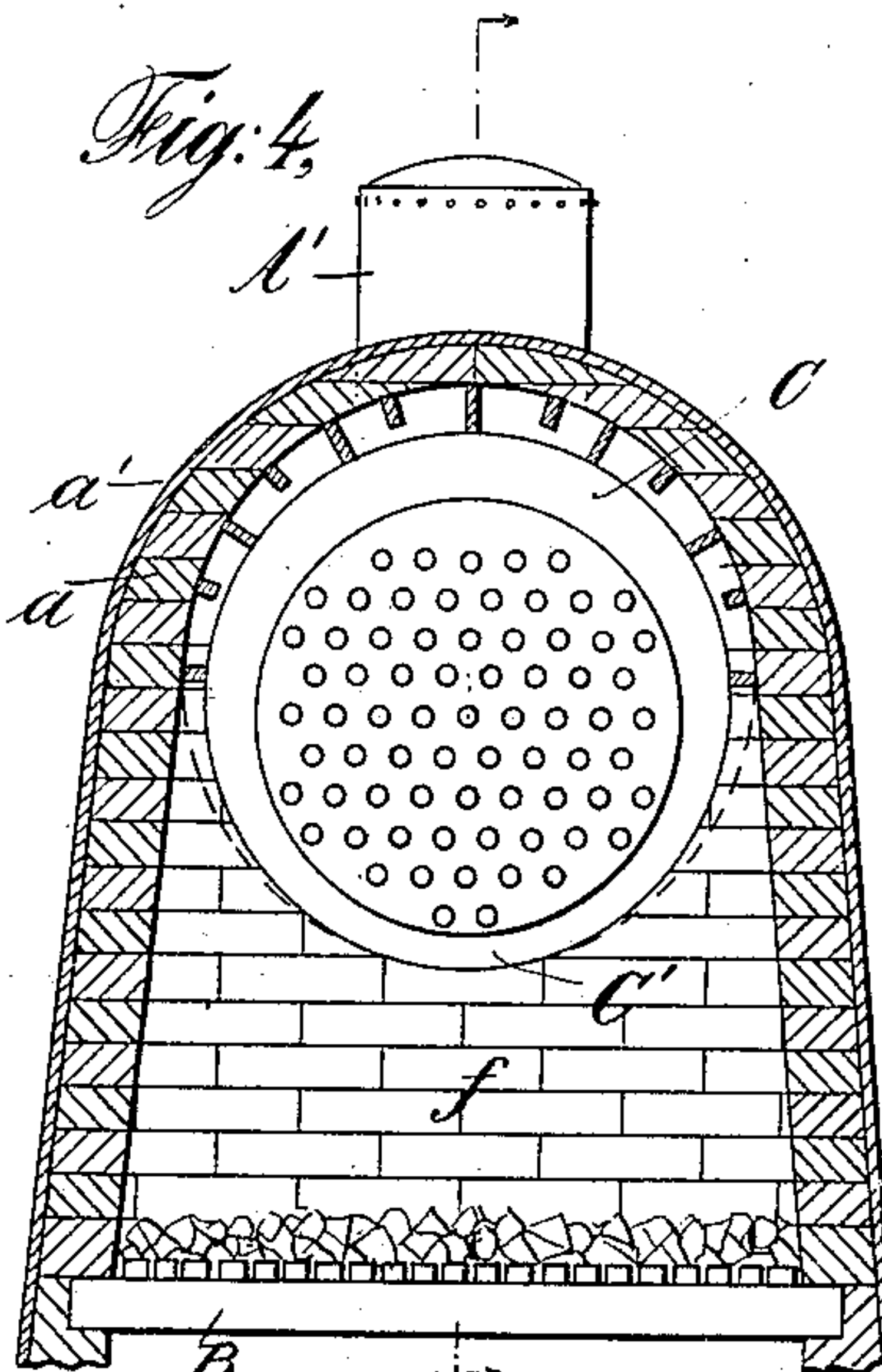


Fig. 4.



WITNESSES:

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LEWIS S. WATRES, OF SCRANTON, PENNSYLVANIA, ASSIGNOR OF FIFTY-ONE ONE-HUNDREDTHS TO ROBERT C. ADAMS, OF SCRANTON, PENNSYLVANIA.

STEAM-BOILER.

No. 887,880.

Specification of Letters Patent.

Patented May 19, 1908.

Application filed February 23, 1906. Serial No. 302,334.

To all whom it may concern:

Be it known that I, LEWIS S. WATRES, a citizen of the United States, residing at Scranton, county of Lackawanna, State of Pennsylvania, have invented certain new and useful Improvements in Steam-Boilers, of which the following is a specification.

This invention relates to horizontal fire-tube cylindrical boilers. Its object is to improve the steaming capacity of the boiler; to eliminate employment of stay bolts and water legs at the fire box end; to make feasible the employment of boilers of greater length than has heretofore been admissible; and generally to simplify and cheapen installation of such a boiler with respect to its connection with the fire box.

To this end, the invention comprises certain novelties of construction or arrangement hereinafter described in detail.

In the accompanying drawings: Figure 1 is a longitudinal section on the line 1—1 of Fig. 2 through a fire box and the fire box end of a boiler; Fig. 2, a transverse section there-through on the line 2—2 of Fig. 1; Fig. 3, a longitudinal section similar to Fig. 1; Fig. 4, a transverse section on the line 4—4 of Fig. 3.

A is the fire box, of which a is refractory brick lining and a' an outer metal shell. It is provided with a proper system of grate bars B and a charging door b . A cylindrical boiler C of which c are the fire-tubes is arranged horizontally and extends within the fire box as at C' beyond the rear wall thereof and over the fuel lying upon the grate bars. The end of the boiler shell projecting through the wall of the fire box is tapered, or is in the form of a frustum of a cone. At the rear of the fire box there is a clear space between the fuel, which may be indicated by f , and the bottom of the boiler shell, this space extending, as seen in Fig. 2, part way up each side of the shell. At the top of the shell, however, the space between it and the fire box is filled in by brick work a^2 .

A' is the ordinary steam drum.

A² is an ordinary mud drum,—located, however, closely adjacent the rear wall of the fire box and at the bottom of the inclined or tapered part C' of the boiler shell.

Agitation and circulation of water within the boiler shell will prevent deposit of sediment upon the lower inclined part C' of the shell within the fire box and sediment tend-

ing to accumulate will be delivered to the mud drum by the inclined wall of the shell.

x is a metal foundation ring upon which the fire box shell and refractory lining are supported.

Figs. 3 and 4 show a construction similar to Figs. 1 and 2 except that the boiler shell is illustrated as projecting further into the fire box and the axis of the reduced end of the boiler within the fire box is not co-incident with the axis of the shell but is considerably below it. This affords a substantial water space unoccupied by fire tubes at the top of the boiler and brings the fire tubes closer to the bottom of the boiler than the construction shown in Fig. 1. The construction described is characterized by an absence of stay bolts and water legs, which become unnecessary when the fire box and boiler are organized as shown and described.

The advantage of the organization shown is that products of combustion rising from the fuel at the rear of the fire box will strike against the inclined wall C' of the boiler shell and will be thrown to the front mingling with other gases rising from the main body of the fuel, the tendency being for all gases to become of equal temperatures and be uniformly effective in the various flues or tubes of the boiler.

I claim as my invention:

1. A horizontal fire-tube boiler, comprising a fire box having usual grate bars and a cylindrical boiler shell having a tapering end extending through the rear wall of the fire box with its rear upwardly inclined end projecting part way across the grate bars, the space between the top of the tapered end of the shell and the wall of the fire box being filled in with refractory material, and a mud drum without the fire box attached to the bottom of the shell at the base of the inclined front portion of that part of the shell.

2. A horizontal fire-tube boiler, comprising a fire box having usual grate bars and a cylindrical boiler shell having a tapering end extending through the rear wall of the fire box with its rear upwardly inclined end projecting part way across the grate bars, the space between the top of the tapered end of the shell and the wall of the fire box being filled in with refractory material.

3. A horizontal fire-tube boiler, comprising a fire box having usual grate bars and a

cylindrical boiler shell having a tapering end extending through the rear wall of the fire box with its rear upwardly inclined end projecting part way across the grate bars.

- 5 4. A horizontal fire-tube boiler comprising a fire box, a cylindrical boiler shell having a tapered end projecting into the fire box beyond the rear wall thereof and having its forwardly inclined end projecting over the

grate bars, the axis of the inner circular re- 10
duced end of the shell being in a plane below the axis of the shell.

In testimony whereof, I have hereunto subscribed my name.

LEWIS S. WATRES.

Witnesses:

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