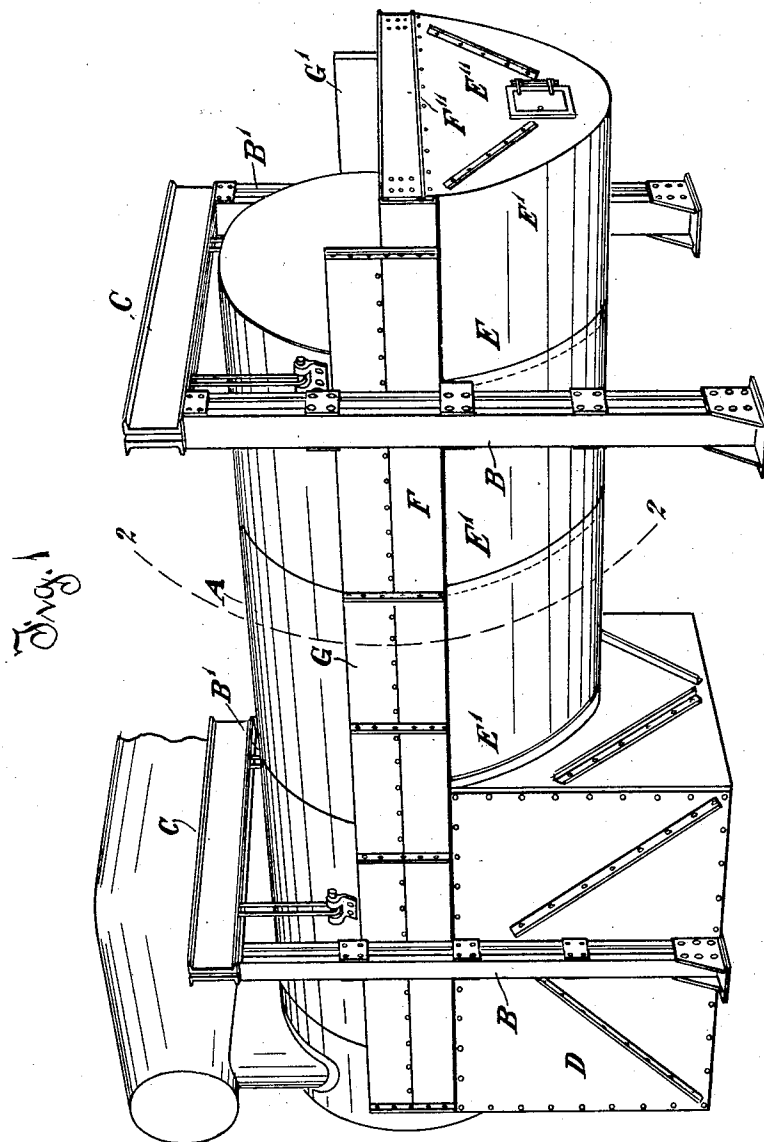


J. B. STANWOOD.
STEAM BOILER FURNACE.
APPLICATION FILED DEC. 12, 1908

1,033,355.

Patented July 23, 1912.

2 SHEETS—SHEET 1.



Witnesses
Oscar J. Norman
L. V. Reist

Inventor
James B. Stanwood
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his Attorney

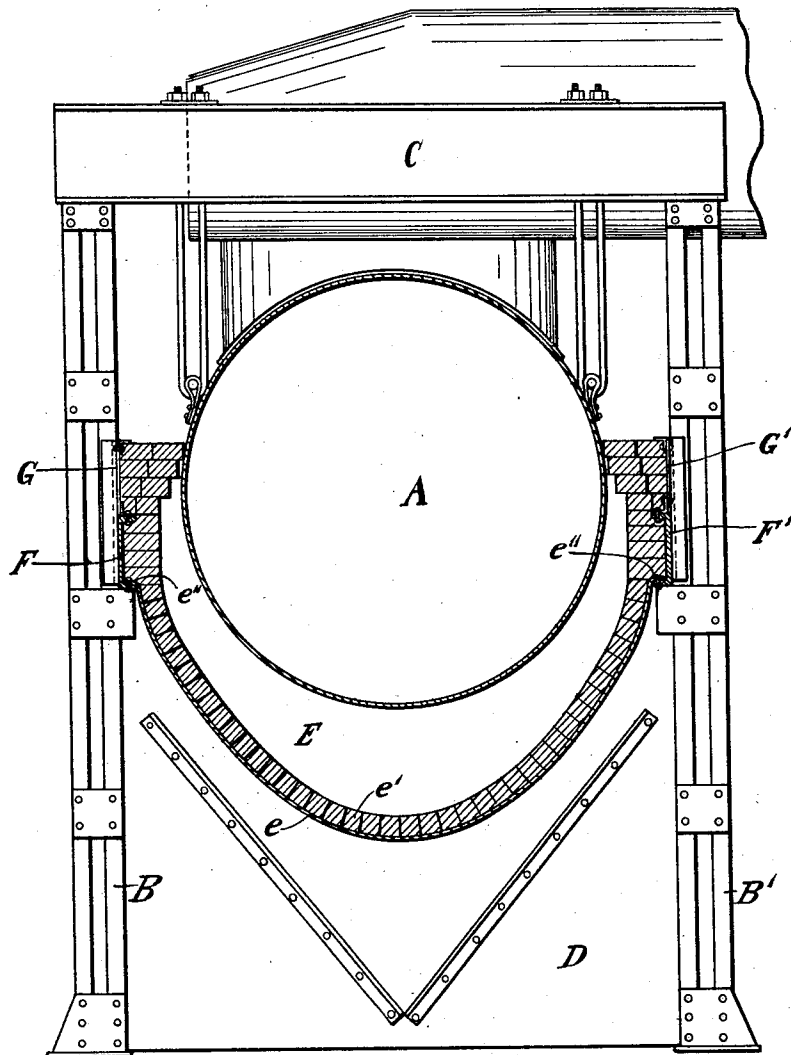
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2 SHEETS—SHEET 2.

Fig 2



Witnesses
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UNITED STATES PATENT OFFICE.

JAMES B. STANWOOD, OF CINCINNATI, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO
CLARENCE E. MEHLHOPE, TRUSTEE, OF CHICAGO, ILLINOIS.

STEAM-BOILER FURNACE.

1,033,355.

Specification of Letters Patent.

Patented July 23, 1912.

Application filed December 12, 1908. Serial No. 467,167.

To all whom it may concern:

Be it known that I, JAMES B. STANWOOD, a citizen of the United States, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented a certain new and useful Improvement in Steam-Boiler Furnaces, of which the following is a full and exact description, reference being had to the accompanying drawings, which form a part of my specification.

My invention relates to steam boiler furnaces and particularly to the combustion chamber about the boiler and the method of constructing and supporting the same.

The object of my invention is to provide a fire-brick-lined metal jacket forming a combustion chamber about the boiler, which shall be self-supporting to maintain its symmetrical disposition about the boiler and which shall always retain this position without the necessity of adjustment, thus doing away with external supports for the metal jacket, such as jacks to support it from below and tie-rods or other mechanism of that character to support its upper edges.

It is necessary that sufficient room be left between the bottom of the boiler and the inner surface of the combustion chamber to provide area for the unrestricted flow of the gases around and about the boiler. Considerably less room, of course, is required above the bottom of the boiler and about its sides. The depression of the combustion chamber below the bottom of the boiler also facilitates the entrance of a workman for repairs if necessary. Heretofore in constructions of this kind it has been found necessary in order to maintain the steel jacket in position to provide jacks or supports along its under surface which support it in symmetrical disposition about the under side of the boiler. It has also been requisite to provide tie rods passing over the top of the boiler and attached to the upper edges of the steel jacket to hold it in proper alinement with the boiler. With such expedients for maintaining the desired position of the jacket with reference to the boiler it has also been found desirable to use supports which were adjustable. In my invention such supports are eliminated and with them the necessity for adjustment.

In carrying out my invention I provide a metal jacket, so shaped that its cross section when in position about the boiler assumes

substantially the shape of a catenary curve,—in other words that shape which a cable of uniform thickness assumes when supported at each end. This jacket is then supported from its upper edges alone. We thus have the sheet metal jacket together with the fire brick with which it is lined disposed about the boiler in the curve which it would naturally assume if left to the action of its own weight. The weight of the sheet metal and the fire brick together maintain the combustion chamber in the shape in which the steel jacket is originally formed and there is no necessity for any external support from below. To uphold the steel jacket, I provide a rigid frame preferably built of metal beams which run the full length of the boiler and which are mounted in any convenient manner on the columns which support the boiler. This produces a rigid construction which maintains the upper edges of the steel jacket in alinement.

Referring now to the drawings, Figure 1 is a perspective view of a boiler construction provided with my improved fire-brick-lined metal jacket combustion chamber, and Fig. 2 is a vertical cross section through the same on the line 2—2 of Fig. 1.

A is the boiler: B B B' B' the supporting columns: C C, the cross beams, which rest on the columns and from which the boiler A is hung: and D, the fire box, which is preferably metal-jacketed as indicated. These parts are of any usual construction and need no further description as they form no part of my invention.

E is the fire-brick-lined metal-jacketed combustion chamber which extends as usual from the throat of the furnace to a point beyond the rear end of the boiler.

e is the metal jacket and e' the tiling or fire brick which lines the same. This metal jacket is built up of sections of boiler plate E' E' E', which are first bent into the desired shape and are then riveted together. In determining the proper sectional form of this jacket the proper catenary curve is calculated.

F F' are metal channel bars running in the direction of the length of the boiler and supported in any convenient manner on the columns B B B' B'. The upper edges of the jacket e are secured to the lower flanges of the channel bars in any convenient manner, as for example in the manner illus-

trated, by forming flanges e'' , which rest upon and are riveted to the flanges of the channel bars, at the upper edges of the jacket. Any other method of securing the metal jacket to the supporting metal beams may be used, it being simply important that the jacket be supported from its upper edges alone, in order to get the full benefit of my invention. The rear ends of the channel bars $F F'$ are joined together by another channel bar F'' , and from the latter is hung a plate E'' , forming the end of the combustion chamber the same being secured to the rear-most plate E' forming the metal jacket about the boiler.

In order to carry the fire brick above the axis of the boiler, I provide side plates $G G'$ which rest upon and are secured to the channel bars $F F'$ and bear against the columns $B B' B'' B'$.

The forward end of the metal jacket is secured to the rear wall of the metal casing about the furnace in any convenient manner.

Having thus described my invention, what I desire to claim as new and to cover by Letters Patent is—

1. The combination with a boiler, of a combustion chamber beneath the boiler, said combustion chamber comprising a metal jacket having its cross section substantially in the form of a catenary curve, said jacket being lined with fire brick, and means for supporting said jacket at its upper, longitudinal edges.

2. In a boiler furnace construction, in combination with the boiler and the supporting columns, a metal casing forming a combustion chamber beneath the boiler, said casing being in cross section substantially in the form of a catenary curve, supporting members running in the direction of the length of said boiler supported on said columns, and means for securing the upper, longitudinal edges of said jacket to said supporting members.

3. In a boiler furnace construction, in combination with the boiler and the supporting columns, supporting members running in the direction of the length of said boiler supported on said columns, and a metal casing forming a combustion chamber beneath the boiler, having a cross section in the form of a catenary curve, the same being suspended from said supporting members.

4. In a boiler furnace construction, in combination with the boiler and the supporting columns, a metal casing forming a combustion chamber beneath the boiler and

having a cross section in the form of a catenary curve, supporting members running in the direction of the length of said boiler supported on said columns, means for securing the upper, longitudinal edges of said casing to said supporting members and a lining of fire brick supported by said casing.

5. In a boiler furnace construction, in combination with the boiler and the supporting columns, longitudinal members supported on said columns, a metal casing forming a combustion chamber beneath the boiler and having a cross-section in the form of a catenary curve, said combustion chamber being supported from said longitudinal members, a fire brick lining formed in said combustion chamber and extending above the longitudinal margins of said metal casing, and means for supporting said fire brick lining above said casing including plates supported on said longitudinal members.

6. In a steam boiler furnace, the combination of a horizontal boiler, a casing comprising an upper supporting member extending along the boiler and spaced therefrom, and a lower member suspended from said upper member and being substantially semi-cylindrical in cross section, and a lining supported between said upper section and the boiler, closing the upper part of the space between the upper member of the casing and the boiler.

7. In a steam boiler furnace, the combination of a horizontal boiler, a casing comprising an upper supporting member extending along the boiler and spaced therefrom, and a lower member suspended from said upper member, and being in the form of a catenary curve in cross section, and a lining supported between said upper section and the boiler, closing the upper part of the space between the upper member of the casing and the boiler.

8. In a steam boiler furnace, the combination of, a boiler, a plurality of supporting columns, transverse members supported by said columns, means suspending said boiler from said transverse members, a casing comprising an upper longitudinal member rigidly supported by said columns and a lower member suspended from said upper member and being substantially semi-cylindrical in cross section, and a lining for said casing.

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