

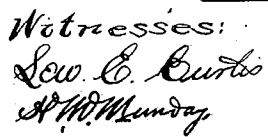
(No Model.)

2 Sheets—Sheet 1.

G. W. LÖNHOLDT.
STEAM BOILER.

No. 513,120.

Patented Jan. 23, 1894.



(No Model.)

2 Sheets—Sheet 2.

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Fig. 3

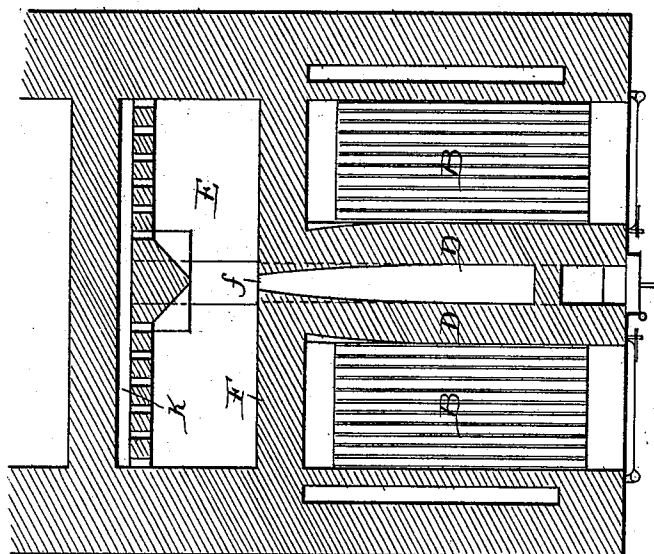
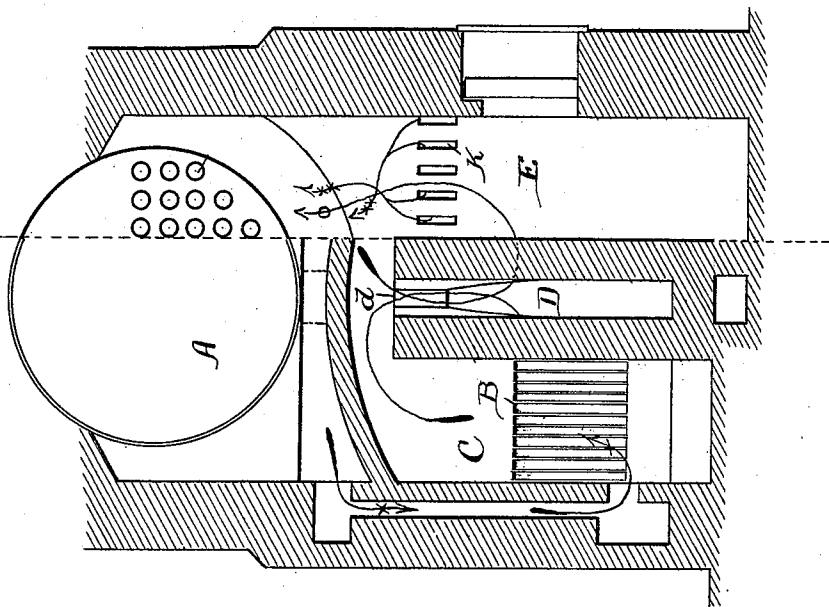


Fig. 2



Witnesses:
S. C. Curtis
H. Munday

Inventor:
Georg Wilhelm Lönholtz.
By Munday, Evans & Adeock,
his Attorneys.

UNITED STATES PATENT OFFICE.

GEORG WILHELM LÖNHOLDT, OF BERLIN, GERMANY, ASSIGNOR TO THE
LOENHOLDT COMPANY, OF CHICAGO, ILLINOIS.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 513,120, dated January 23, 1894.

Application filed August 26, 1893. Serial No. 484,134. (No model.)

To all whom it may concern:

Be it known that I, GEORG WILHELM LÖNHOLDT, a subject of the Emperor of Germany, residing at Berlin, in the Empire of Germany, have invented a new and useful Improvement in Steam-Boilers, of which the following is a specification.

My invention relates to improvements in steam boiler furnaces.

Steam boiler furnaces heretofore commonly in use are subject to two great evils or objections: first, the incomplete combustion of the fuel, resulting in great waste and also great annoyance from smoke, and, second, great injury by burning and warping parts of the furnace or grate and of the boiler by reason of being subjected to uneven and great heat.

The object of my invention is to overcome these difficulties or objections by a simple and durable construction and combination of the parts of the boiler furnace together; and to this end my invention consists in the novel construction and combination of parts herein shown and described and more particularly pointed out in the claims—that is to say my invention consists in a steam boiler furnace, of the combination with the boiler of a furnace, fire pot, and a long, narrow, hollow central combustion chamber projecting upward from the middle of the grate, and having a slot or opening at the top through which the flame and products of combustion are drawn downward through the fire pot before being projected against the heat absorbing surfaces of the boiler. The flame and products of combustion thus enter this long narrow central, upwardly projecting combustion chamber equally from both sides of the fire pot in sheets, and as the flame is drawn downward into the fire proof body of the combustion chamber, the separate sheets of flame entering from opposite sides and crossing each other, are thoroughly mingled with each other, and also with a sufficient supply of fresh heated air and all so connected together as they pass downward through the narrow combustion chamber that a complete combustion is effected; and by causing the flames to thus pass downward and concentrating them in a comparatively narrow combustion chamber and subsequently projecting the flames against the heat ab-

sorbing surfaces of the boiler, the latter are protected against injury while at the same time the heat produced is utilized to the fullest extent and the absorption of the heat by the boiler is also prevented from interfering with the complete combustion of the fuel.

In the accompanying drawings, which form a part of this specification, and in which similar letters of reference indicate like parts throughout the several figures, Figure 1 is a central vertical longitudinal section of a furnace boiler or boiler furnace embodying my invention. Fig. 2 is a vertical cross section on line *xx* of Fig. 1 and as to the right hand part on the lines *yy* of Fig. 1; and Fig. 3 is a partial longitudinal section taken on the line 3 3 of Fig. 1.

In the drawings A represents the steam boiler, B the grate, C the fire pot, D the long narrow central upwardly projecting hollow combustion chamber extending upward into the fire pot from the grate and having a slot or opening *d* at the top through which the flames may enter from either side of the fire pot and pass down and through the combustion chamber, and thence into and through the flues E in contact with the boiler.

F represents the bridge wall at the rear end of the fire pot, the same having a slot or opening *f* at the lower portion communicating with the hollow combustion chamber D and through which the flame and products of combustion pass into the flue E which conducts the same to and against the boiler.

G represents the feed door, passage or opening through which the fuel may be fed into the fire pot. Through this or other suitable opening provided for the purpose a sufficient supply of fresh air may be admitted to the fire pot and thence into the combustion chamber D where it will be mingled with the meeting and crossing sheets of flame and concentrated therewith.

H is a valve or damper for controlling the admission of air to the fire pot through the grate from below.

K is a flue through which fresh heated air may be admitted when desired into the vertical flue E below the boiler.

I claim—

1. In a boiler furnace, the combination with a steam boiler of a furnace grate, a fire pot and a long, narrow, hollow, central combustion chamber projecting upward from the middle of the grate or bottom of the fire pot, and having a slot or opening at the top through which the flame and products of combustion are drawn downward in sheets from both sides of the fire pot through the same and caused to cross and be concentrated together, and a flue or passage leading from said combustion chamber to the boiler, the fire pot being without other exit passage than through said central combustion chamber substantially as specified.

2. In a boiler furnace, the combination with a steam boiler of a furnace grate, a fire pot and a long, narrow, hollow, central combustion chamber projecting upward from the middle of the grate or bottom of the fire pot, and having a slot or opening at the top through which the flame and products of combustion are drawn downward in sheets from both sides of the fire pot through the same and caused

to cross and be concentrated together, and a flue or passage leading from said combustion chamber to the boiler, said boiler furnace being also provided with means for admitting fresh air into said fire pot and thence into said upwardly projecting combustion chamber, the fire pot being without other exit passage than through said central combustion chamber substantially as specified.

3. In a boiler furnace, the combination of a steam boiler A, with grate B, fire pot C, upwardly projecting hollow, narrow combustion chamber D, and a flue E leading from said combustion chamber D to the boiler, the fire pot being without other exit passage than through said central combustion chamber substantially as specified.

In witness whereof I hereunto set my name in presence of two witnesses.

GEORG WILHELM LÖNHOLDT.

Witnesses:

REINHOLD WEIDNER,
MAX WAGNER.