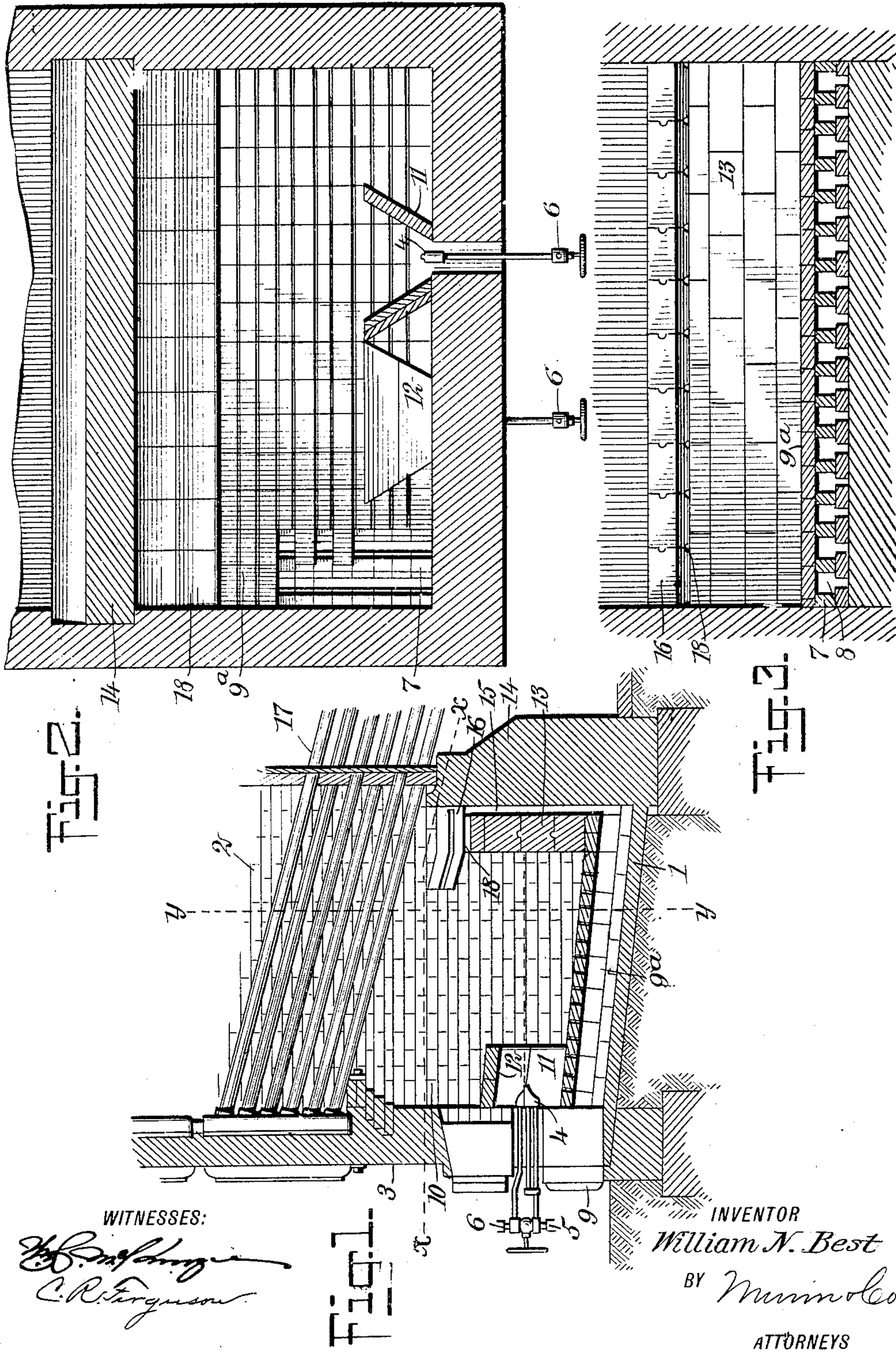


No. 879,806.

PATENTED FEB. 18, 1908.

W. N. BEST.
BOILER FURNACE.
APPLICATION FILED MAY 2, 1906.



WITNESSES:
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UNITED STATES PATENT OFFICE.

WILLIAM N. BEST, OF NEW YORK, N. Y., ASSIGNOR TO THE INTERNATIONAL CALORIFIC COMPANY, OF LOS ANGELES, CALIFORNIA, A CORPORATION OF CALIFORNIA.

BOILER-FURNACE.

No. 879,806.

Specification of Letters Patent.

Patented Feb. 18, 1908.

Application filed May 2, 1906. Serial No. 314,783.

To all whom it may concern:

Be it known that I, WILLIAM N. BEST, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented new and useful Improvements in Boiler-Furnaces, of which the following is a full, clear, and exact description.

This invention relates to improvements in boiler furnaces in which oil is used as a fuel, the object being to provide means not only for the purpose of admitting air requisite for combustion in the burning of a fuel, but also to provide means to deflect heat so that no impingement of heat will be deflected against any of the elements of the boiler.

Other objects of the invention will appear in the general description.

I will describe a boiler furnace embodying my invention and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional elevation of a boiler furnace embodying my invention; Fig. 2 is a section on the line $x-x$ of Fig. 1; and Fig. 3 is a section on the line $y-y$ of Fig. 1.

Referring to the drawing, 1 designates the base-plate of the fire-box or furnace, 2 the side walls, and 3 the front setting; and extending through openings in the front setting are burners 4 which receive oil, tar, or the like, through the pipes 5, and receive steam for mingling with the oil or tar, through the pipes 6.

Supported on the base of the furnace and extended longitudinally thereof are rows of bricks 7, which are spaced apart to provide air ducts 8 which receive air through the usual ash pit door 9.

Supported on the rows of bricks 7 is a checker-work consisting of ordinary standard fire-brick 9^a; this checker-work of fire-brick has an air-space between the rows of brick of approximately about one-sixteenth of an inch, through which air can pass from the ducts 8. Through these ducts the air will be drawn and distributed evenly in the furnace or fire-box 10, thus giving an even distribution of oxygen requisite for combustion, be-

tween the fan-shaped flames emitted from the burner or burners.

It is well known that in tar and also in many oils, there is a quantity of water which often causes a great deal of difficulty and sometimes explosions, because of the fact that the water has a tendency to put out the fire in the fire-box; especially if the fire is low. I obviate this difficulty by the use of an igniting chamber approximately as shown, the same being made from refracting material, which retains the heat, keeping it above the igniting temperature for a number of minutes, while the pocket of water is passing out of the supply pipe and burner, thus insuring the igniting of the fuel when the tar or oil begins again to flow through the burner.

The igniting chamber as here shown consists of slabs 11 of refractory material into which the burner extends. These slabs are divergent from the front setting and extend upward from the checker-work, and if desired a cover 12 may be placed thereon; this of course, also consisting of refractory brick. The cover will maintain the heat as close to the burner as possible.

Extended upward from the checker-work at the inner end of the fire-box or furnace is a cross wall 13 consisting of fire-brick, the brick being joined by tongues and grooves, as clearly shown in Fig. 1. This cross wall is slightly forward of the bridge wall 14, thus forming an air space 15 which communicates with the ducts 8, and extending along the upper edge of this cross wall is an arch 16 consisting of refractory brick tongued and grooved together; this arch projects forward from the cross wall and is inclined upward in substantial parallelism with the boiler tubes 17, and the arch is provided at the under side with a plurality of ports 18 which permit the passage of air from the air space 15 into the furnace.

With my method of equipment I get three distinct courses of flame and heat; first from the burner or burners to the cross wall, thence deflected by the arch, the flame and heat is forced upwardly until it strikes the front end setting, when it rebounds rearwardly and upwardly through the elements of the boiler, thus spending its power so as to do no injury to the elements of the boiler. Further, with a furnace made in accordance

with my invention I provide highly super-heated air requisite for combustion, and it is the only method that produces three distinct courses of flame and heat after removing the
5 ordinary grate bars, and which thereby gives an even distribution of heat throughout the entire fire-box.

Having thus described my invention, I claim as new and desire to secure by Letters
10 Patent:—

1. In a furnace, the burner extending through the front setting thereof, a plurality of rows of brick supported on the base of the furnace and spaced apart to form air ducts, a
15 bridge wall, a cross-wall, a checker-work of refractory blocks supported on said rows of brick, and from which, said cross-wall extends upward, the said cross-wall being spaced from the bridge wall to form an air
20 space communicating with the air ducts, an arch at the upper portion of the cross-wall, and having perforations at its under side providing communication between said air space and the interior of the furnace, the

said arch being projected forward of the
cross-wall, the said projection being inclined upward.

2. A furnace having a combustion chamber, a burner communicating therewith, a bridge wall, a cross wall spaced therefrom to
30 form an air passage, a conduit for delivering air from the outside atmosphere to said passage, and an arch at the upper portion of the bridge wall closing the passage between the cross wall and the bridge wall and extending into the combustion chamber, said
35 cross wall being provided with perforations adjacent the lower side of the arch, whereby air may flow from the air passage between the walls into said combustion chamber and
40 beneath said arch.

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

WILLIAM N. BEST.

Witnesses:

JNO. M. RITTER,
C. R. FERGUSON.