

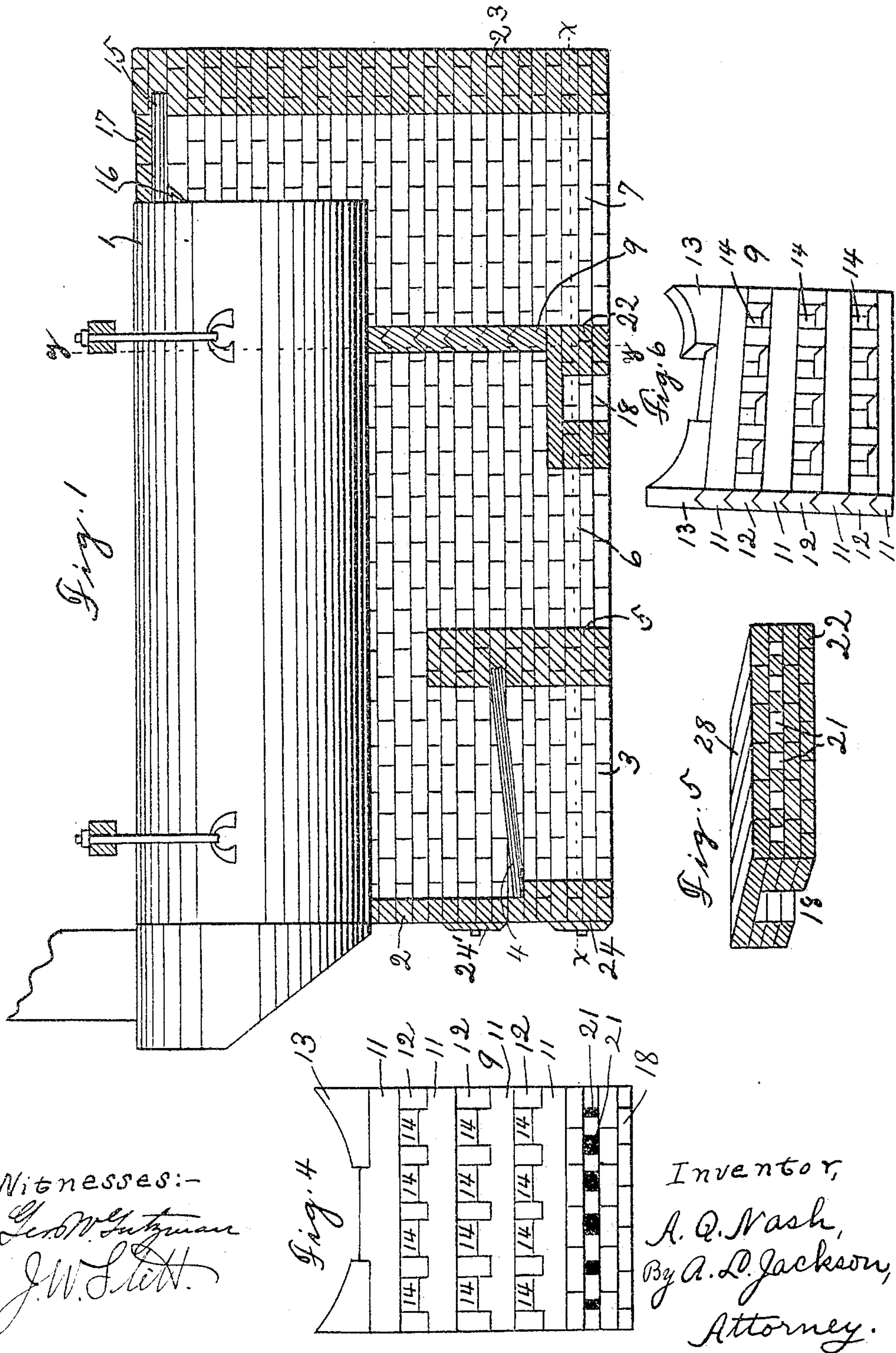
No. 775,116.

PATENTED NOV. 15, 1904.

A. Q. NASH.
STEAM BOILER FURNACE.
APPLICATION FILED JULY 29, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:-

Geo. W. Lutzman
J. W. Little

Inventor,
A. Q. Nash,
By *A. L. Jackson,*
Attorney.

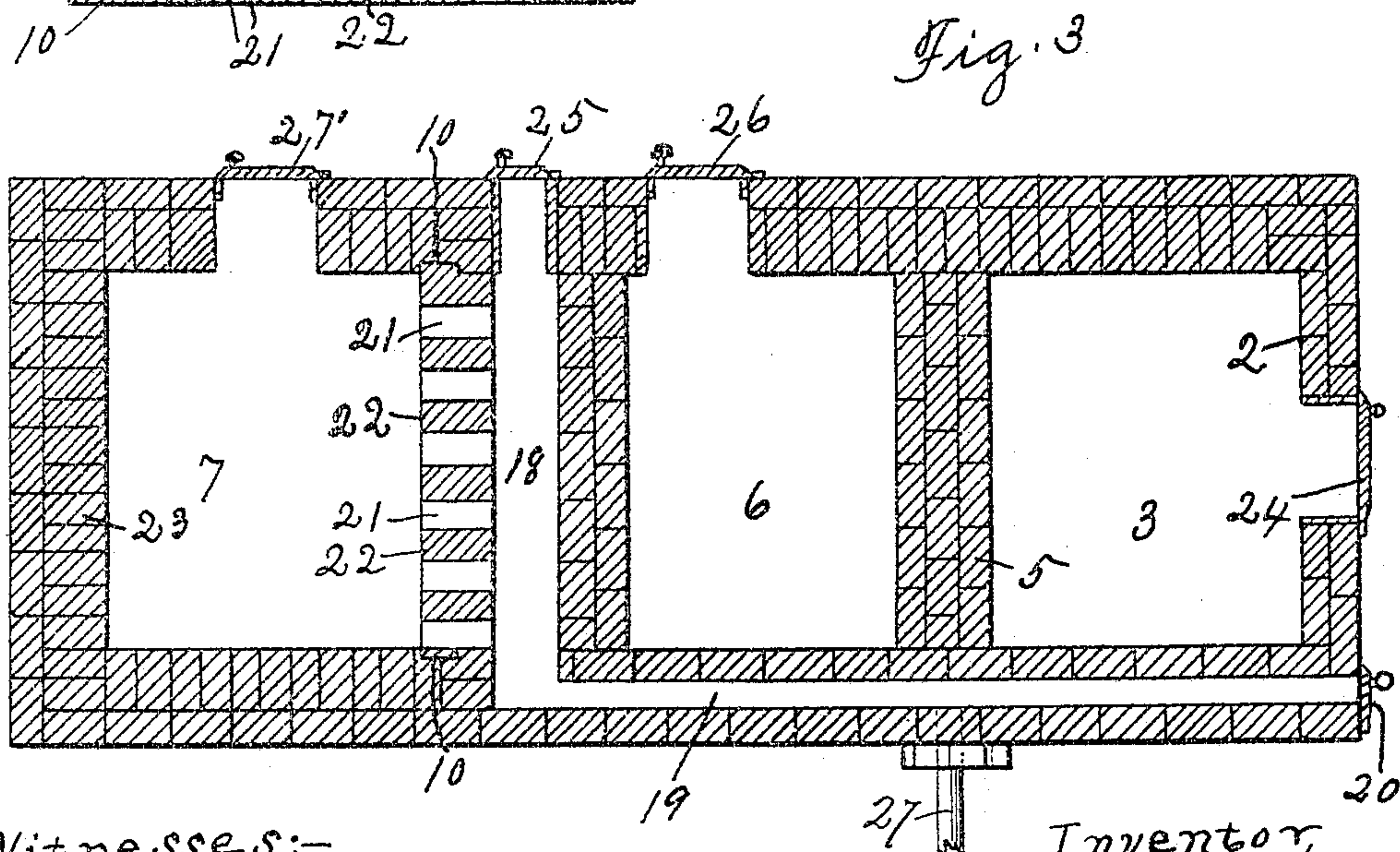
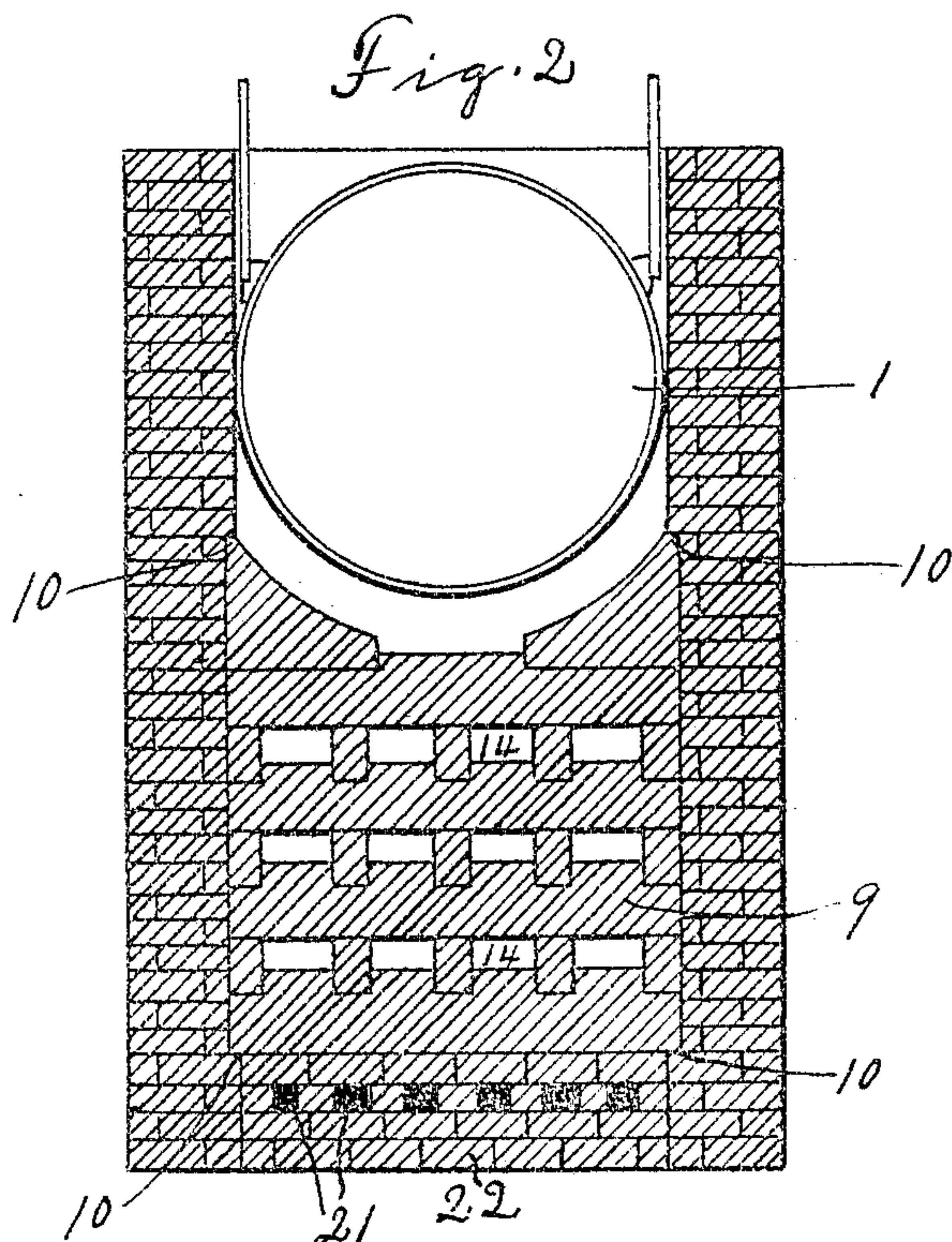
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2 SHEETS—SHEET 2



Witnesses:-

Geo. W. Gutzman.
J. W. Lott.

Inventor,
A. Q. Nash,
By *A. L. Jackson,*
Attorney.

UNITED STATES PATENT OFFICE.

ALEXANDER Q. NASH, OF SHERMAN, TEXAS.

STEAM-BOILER FURNACE.

SPECIFICATION forming part of Letters Patent No. 775,116, dated November 15, 1904.

Application filed July 29, 1903. Serial No. 167,378. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER Q. NASH, a citizen of the United States, residing at Sherman, Texas, have invented certain new and useful Improvements in Steam-Boiler Furnaces, of which the following is a specification.

This invention relates to furnaces for steam-boilers, heating apparatus, brick-kilns, kilns and driers, and other purposes, and more particularly to means for facilitating the combustion and for accomplishing a more complete combustion; and the object is to equip the furnaces with heat-retaining chambers having baffle-walls which will not be torn to pieces by the drafts of intense heat and to provide means for consuming the smoke or gases which are generated by the combustion of the material. The advantages of such appliances are that the construction will be permanent and the fuel will be completely consumed and the calorific power will be much increased.

Other objects and advantages will be fully explained in the following description, and the invention will be more particularly pointed out in the claims.

Reference is had to the accompanying drawings, which form a part of this application and specification.

Figure 1 is a vertical longitudinal section of the furnace. Fig. 2 is a vertical transverse section of the same along the line *yy* of Fig. 1. Fig. 3 is a horizontal section of the same along the line *xx* of Fig. 1. Fig. 4 is a front elevation of the baffle-wall. Fig. 5 is a perspective view in section of the hot-air or steam chamber placed under the furnace and under the baffle-wall. Fig. 6 is a perspective view of the baffle-wall.

Similar characters of reference are used to indicate the same parts throughout the several views.

For the purpose of illustrating this invention a boiler 1 is shown suspended in a furnace 2, which may be of any suitable design. The furnace is provided with an ash-pit and fire-box 3 and grate-bars 4 of suitable design. A fire-wall 5, constructed of brick or other refractory material, is provided. The furnace is provided with two combustion-chambers 6 and 7. The fire-wall 5 serves to prevent the

fuel from being thrown into the chamber 6 and also deflects the draft in an upward direction. Any incombustible matter that may be carried up in the draft will strike the bottom of the boiler and be deflected back to the bottom of chamber 6. A baffle-wall 9 is provided to check the rearward rush of the flames and unconsumed particles. This wall 9 will be subjected to intense heat. Baffle-walls heretofore constructed have been insufficient to resist for any considerable time the intense heat to which such walls are subjected. I have set this wall 9 slightly in the abutting furnace-walls to make the same steady at 10. This wall is constructed of bars 11 and brick 12 or other suitable refractory material, and the bars and blocks are provided upon one edge with triangular projections and upon the other edge with triangular recesses and fitted together, thus affording a structure which will be impenetrable by the draft of flame except through the openings provided. Irregular-shaped blocks 13 are placed on top of the wall 9 to conform to the shape of the boiler, the top bar 11 being fitted into these blocks. In Fig. 2 the boiler is shown somewhat elevated from its normal position. The draft passes mainly through the openings 14. The upper edge of the baffle-wall 9 extends up close to the boiler and is curved concentrically therewith, between which boiler and the upper edge of the baffle-wall there is only a limited space, the draft passing mainly through the openings 14, which are formed by leaving spaces between the blocks 12. Chamber 7 is the chamber of complete combustion. The part of this chamber that is not covered by the boiler is covered by bars 15, which rest in the upper part of the furnace-wall and on brackets 16, attached to the end of the boiler. Bricks 17 or other suitable masonry are placed on top of the bars 15. A hot-air or steam chamber 18 is provided for aiding the combustion. This chamber is located in the chamber 6, and a draft-duct 19 through a side wall of the chamber connects this chamber with the front part of the furnace. This duct is closed by a suitable door 20. The duct or passage 19 is for the introduction of steam or air into the chamber 18 by means of pipe 27. The air or steam is superheated in the cham-

ber 18 and escapes through openings 21 in the wall 22 to the chamber 7 and comes in contact with the flame which comes through the baffle-wall 9. The back wall 23 of the furnace and of the combustion-chamber 7 is constructed of suitable masonry, and it is preferable to line this wall with fire-brick or other refractory material on the inside.

The ash-pit 3 is provided with a suitable door 24. The hot-air chamber 18 is provided with a door 25 of suitable size and form to permit the removal of any accumulations. The first combustion-chamber 6 is provided with a door 26. The complete-combustion chamber 7 is provided with a door 27 to permit the removal of any accumulations and for inspection. The hot-air chamber 18 is provided with a cover 28, which may be made of fire-brick, clay, or other suitable material.

Fuel is fed through the upper door 24 into the chamber 3, where it is ignited. The draft of flame and gases or smoke pass into the chamber 6, where the fuel is consumed. The baffle-wall 9 checks the rush of flame and causes a complete disintegration of the fuel. The gases that may escape through the openings in the baffle-wall are completely consumed in the chamber 7 by coming in contact with the superheated steam or air. The result is that there is no smoke or gases to escape into the atmosphere, and all the fuel is utilized for producing heat.

The baffle-wall is composed of bars and blocks, said bars and blocks being provided upon one edge with a triangular projection and upon the other edge with a triangular recess, so that when the wall is constructed the products of combustion can pass only through the openings of the wall, and any settling of the wall or fracture of the parts comprising said wall will not impair its operation or efficiency, because of the manner in which the parts of the wall are joined together. The grooves in the blocks and bars can be lowered on the upward-projecting tongues. The triangular dovetailing of the blocks or brick will allow these blocks or brick to close any crevice that may be made between the same by the heat-drafts, because the block or brick will close or go downward without any other adjusting means than gravity. This construction prevents the possibility of the draft or flame striking through between the blocks and bars, as is the case with brick or flat stones.

Various changes may be made in the construction of the various parts composing this invention without departing from my invention.

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

1. A furnace having suitable side and end

walls, said side walls having grooves therein, a combustion-chamber, a complete-combustion chamber, and a baffle-wall separating said chambers, said baffle-wall being constructed of bars set in grooves in said side walls and having triangular projections upon their upper edges, and blocks spaced apart for the passage of flame having triangular recesses in their lower edges engaging the triangular projection of said bars, spaces being left between said blocks for the passage of heat and flame.

2. In a furnace provided with suitable side and end walls, said side walls having grooves therein, a combustion-chamber, and a complete-combustion chamber; a baffle-wall set in grooves in the side walls of said furnace, and a hot-air chamber placed in said combustion-chamber and supporting said baffle-wall and provided with passages for the admission of hot air and discharge-openings into said complete-combustion chamber.

3. In a furnace provided with a fuel-chamber and an ash-pit combined, a first combustion-chamber, and a fire-wall partly separating said chambers; a complete-combustion chamber, a hot-air chamber located in said first combustion-chamber and provided with openings for the admission of hot air or steam and with openings for discharging superheated air or steam into said complete-combustion chamber, and a baffle-wall having openings therethrough and supported on said hot-air chamber and forming a check to the rushing flames and gases before reaching said complete-combustion chamber.

4. In a furnace provided with a fuel-chamber, a combustion-chamber, and a complete-combustion chamber arranged in series; a hot-air or steam chamber located in said combustion-chamber and provided with a passage for supplying the same with hot air or steam and provided with discharge-openings into said complete-combustion chamber, and a baffle-wall placed on said hot-air chamber and set in grooves in the side walls of said furnace and forming a check between said combustion-chamber and the said complete-combustion chamber, the side walls of the furnace having grooves to receive said baffle-wall, said baffle-wall being constructed of bars each having a triangular projection upon one edge thereof and blocks, each having a triangular recess therein, engaging said bars with spaces between the blocks for the passage of hot air and flame.

In testimony whereof I set my hand, in the presence of two witnesses, this 25th day of July, 1903.

ALEXANDER Q. NASH.

Witnesses:

A. L. JACKSON,
J. W. STITT.