No. 706,420. Patented Aug. 5, 1902.

W. T. KEOGH.

SMOKE CONSUMER.

(Application filed Oct. 5, 1901.)

(No Model.) 2 Sheets—Sheet 1.

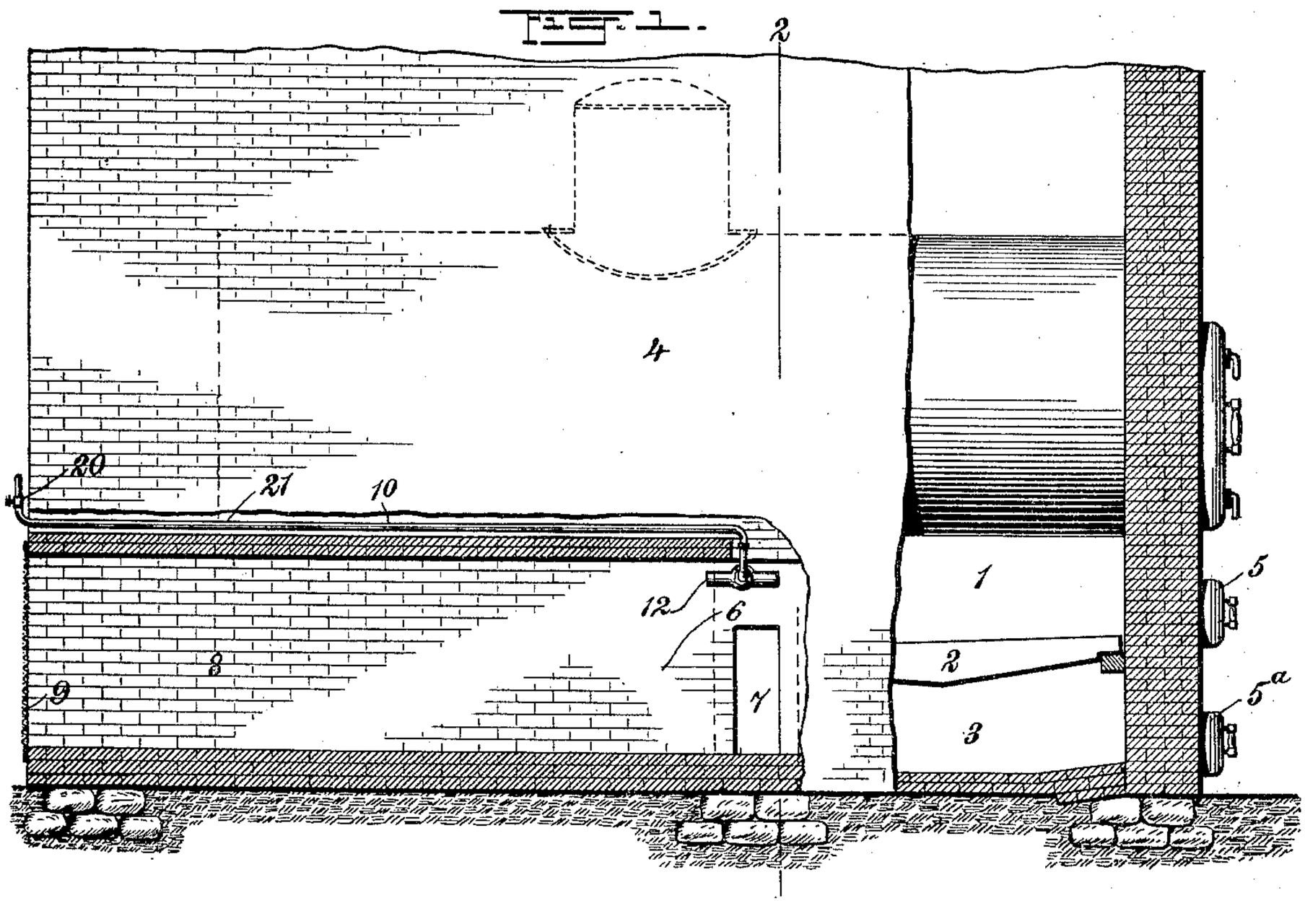

Fig. 2.

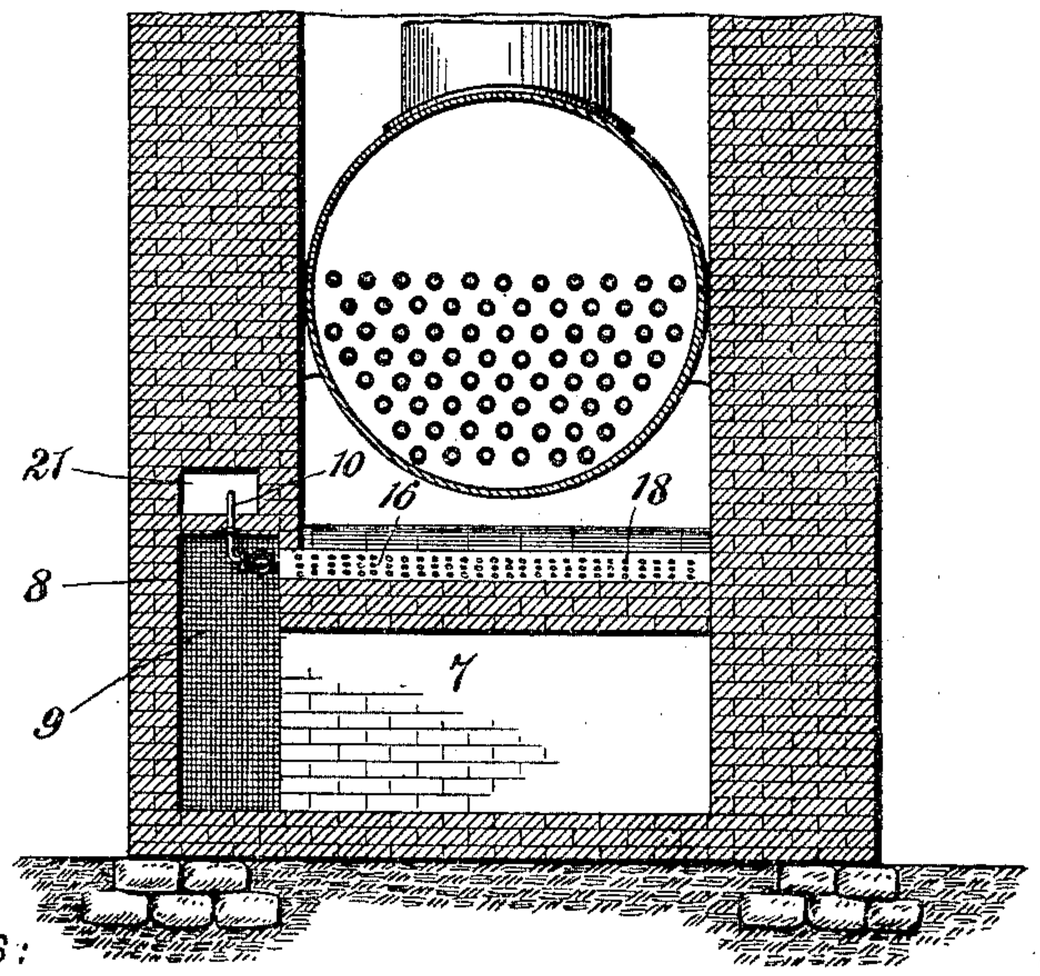

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Fig. 3.

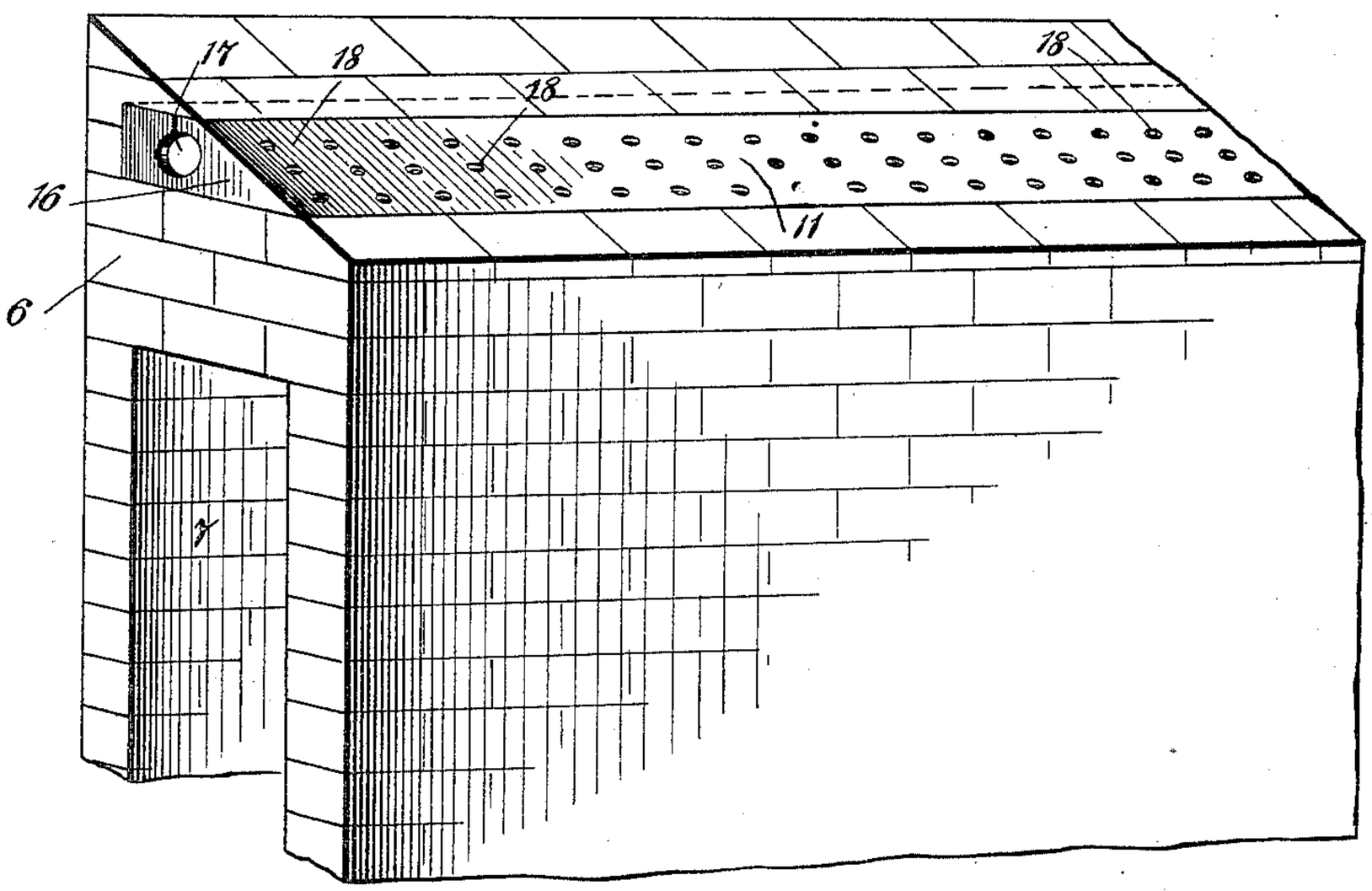
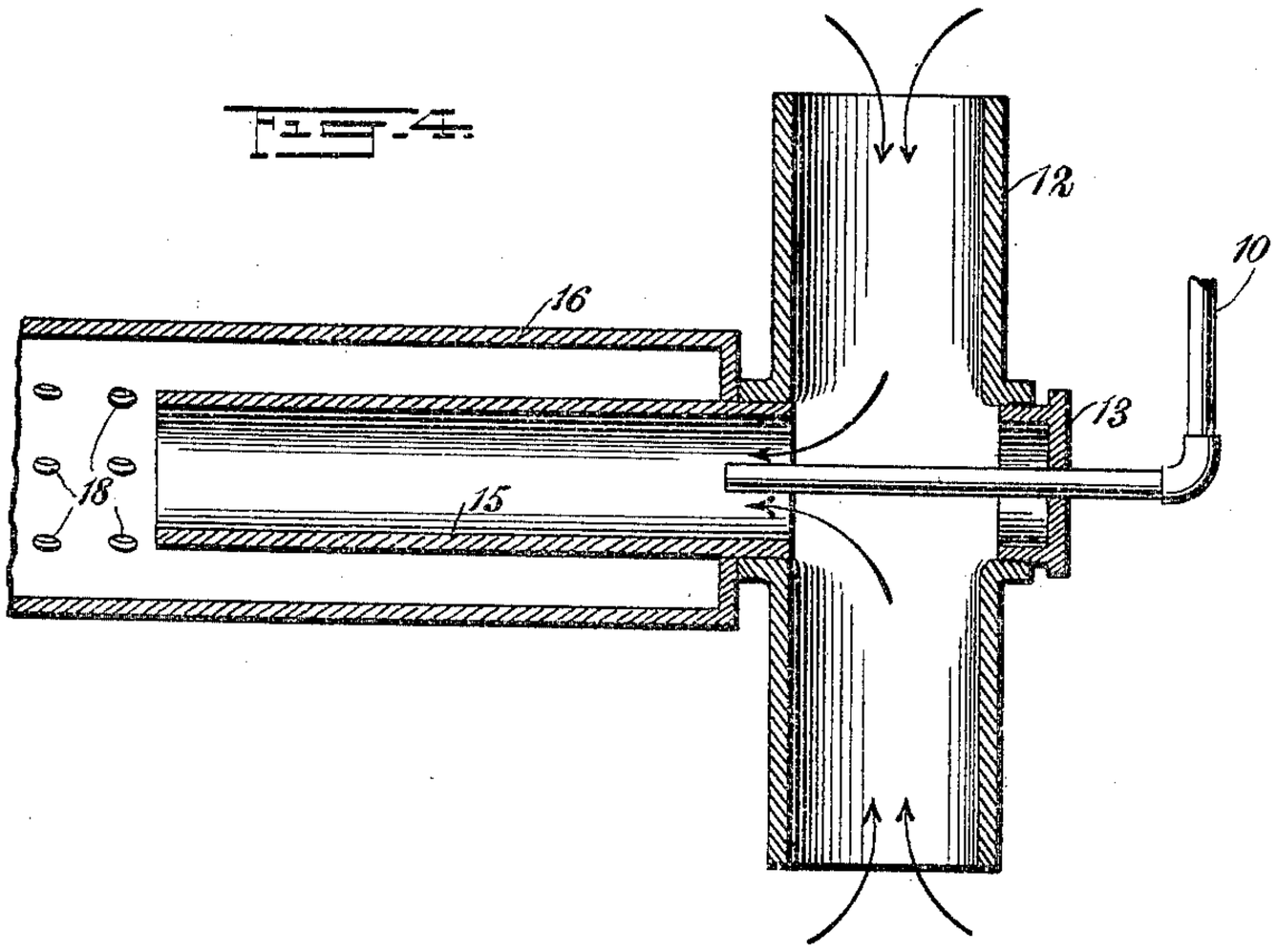


Fig. 4.



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WILLIAM T. KEOGH, OF NEW YORK, N. Y.

SMOKE-CONSUMER.

SPECIFICATION forming part of Letters Patent No. 706,420, dated August 5, 1902.

Application filed October 5, 1901. Serial No. 77,695. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM T. KEOGH, 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 a new and Improved Smoke-Consumer, of which the following is a full, clear, and exact description.

My invention relates to smoke-consumers, more particularly of the type in which steam is used.

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 side elevation, partly in section, of a boiler and its setting, to which my invention is applied. Fig. 2 is a vertical cross-section of the same on the line 2 2 in Fig. 1. Fig. 3 is a perspective view of the smoke-consumer, and Fig. 4 is a sectional view showing certain details hereinafter more fully described.

The drawings represent the smoke-consumer as applied under an ordinary steam-boiler of modern construction. The fire-box is shown at 1, the grate-bars at 2, and the ash-pit at 3. The doors of the fire-box and ash-pit are shown at 5 5^a, and the boiler is shown at 4. Immediately under the boiler and adjacent to the fire-box is the smoke-consumer proper, consisting of a metallic member having the form of a hollow truncated wedge 16 and provided with perforations 18 and also with a large aperture 17. This hollow metallic member is provided with three faces at right angles with each other and with a beveled face 11, which has substantially the same slope as the path of the flames and is parallel therewith. The object of this construction is to make the hollow member of the shape adapted to facilitate its insertion in masonry—that is to say, three sides of the hollow member are at right angles, so that bricks and mortar can be readily fitted around the same, whereas the sloping or beveled side is not embedded in masonry, but is disposed directly in the path of the flames. The flames pass from the fire-box obliquely upward and in immediate contact with the surface 11, so that the several perforations 18 are brought into immediate proximity with the burning smoke. It is at this point that the combustion of the smoke takes place.

A steam-pipe 10, provided with a hand-valve 20, enters through a hot-air passage 21 and a threaded cap 13 and passes diametrically through a pipe 12 and enters a pipe 15, as shown in Fig. 4. The pipe 12 and the pipe 15 are secured together in the form of a tubular T, the pipe 15 projecting some little distance into the truncated wedge-shaped member 16. Steam being admitted by means of the hand-valve 20 escapes into the center of the pipe 15, thus drawing air into the respective ends of the tube 12, as indicated by the arrows in Fig. 4. The steam immediately expands and exerts an aspirating action upon the air, whereby large volumes of air are forcibly carried into the hollow trunk 16, escaping through the perforations 18 into the flames. The bridge-wall 6 is provided with a passage 7, disposed at right angles to the boiler and parallel to the hollow truncated member above described. At right angles with the passage 7 and located in one of the supporting-walls parallel with the boiler is another passage 8, which is closed at its outer end by means of a wire screen 9. This wire screen is for the purpose of preventing loose objects—such as scraps of paper, rags, &c.—from entering the air-passage 8. Each of these air-passages is heated more or less by the hot masonry, and the air is thus rendered more suitable for entering the flames.

I find that comparatively little steam is needed to carry in considerable air and that such steam as is needed exerts a beneficial influence upom the flames, causing the same to burn brightly. This steam is by no means wasted.

I find that the smoke-consumer is very efficient, can be constructed cheaply and simply, does not contain any part which is readily burned out, and is easily managed. The percentage of coal saved by the combustion of the smoke in this smoke-consumer is exceptionally large and the operation of the device is more economical than has heretofore been attained with smoke-consumers. By having the hollow member 16 made of heavy iron I avoid in a great measure the extensive corrosive effect of heat coupled with air.

This smoke-consumer has the advantage

that it can be readily applied to machinery now in operation and with comparatively few structural changes. It can be operated by any engineer or fireman of average intelligence.

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

1. A boiler-furnace provided with a bridge-wall having a rearwardly-inclined upper face, a metallic distributing member having an inclined side and embedded in said bridge-wall for its inclined side only to be exposed through, and to lie in flush relation with, the inclined top face of said bridge-wall, said exposed inclined side of the member having a plurality of perforations, air and steam channels extending through a wall of the furnace, an air-supply tube located in the air-channel and coupled at a point intermediate of its length to one end portion of the distributing member, a combining-tube opening into the air-tube and extending into and surrounded by the distributing member, and a steam-pipe leading through the steam-flue and extending into the combining-tube.

2. A boiler-furnace provided with a bridge-wall, a distributing member having jet-perforations, an air-supply tube coupled at a point intermediate of its length to one end portion of the distributing member and having two open ends, a combining-tube united at one end to the air-tube and extending for the major portion of its length into a non-perforated portion of the distributing member, and a steam-pipe extending across the air-tube and into the combining-tube, whereby the combining-tube is protected by a surrounding chamber in, and the metallic portions of, the distributing member, and a small steam-pipe has its delivery end fitting loosely in a comparatively large combining-tube so as to provide for the unobstructed inward flow of the air-current through the open-ended air-tube.

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

WILLIAM T. KEOGH.

Witnesses:
WALTON HARRISON,
EVERARD B. MARSHALL.