No. 742,208. PATENTED OCT. 27, 1903.

L. C. MOONEY.

SMOKE CONSUMING FURNACE.

APPLICATION FILED JAN. 26, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

FIG. 1.

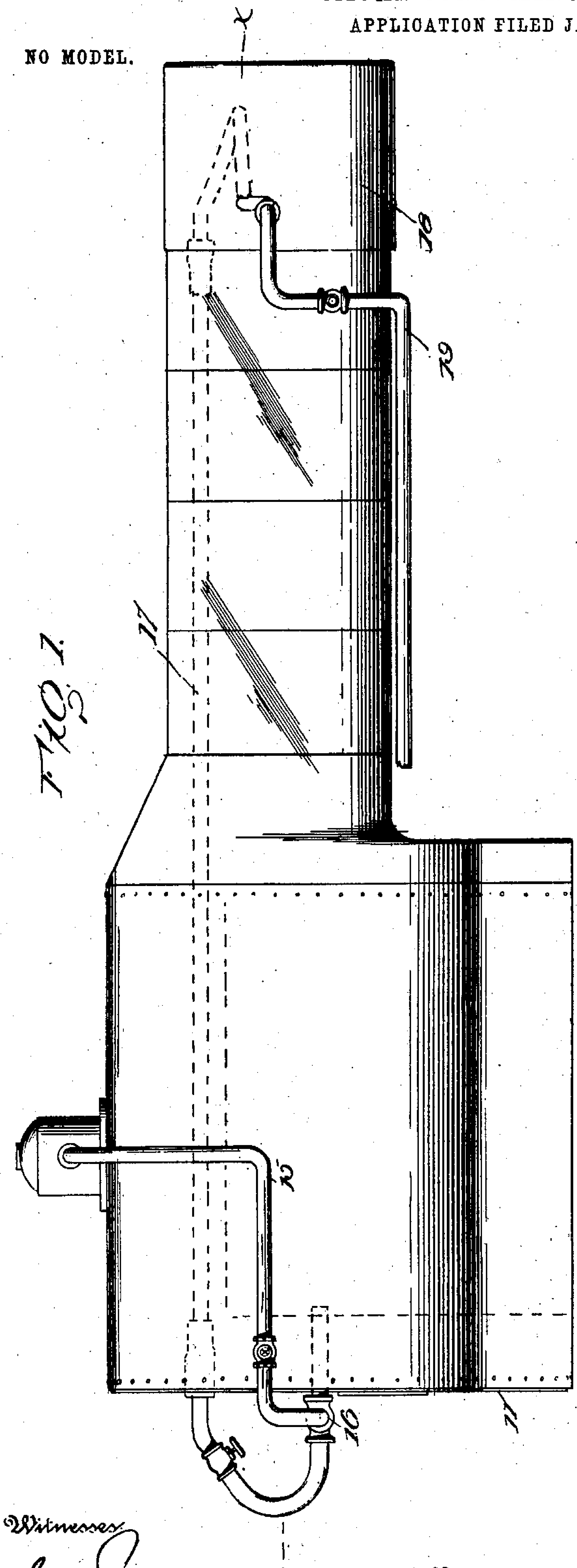
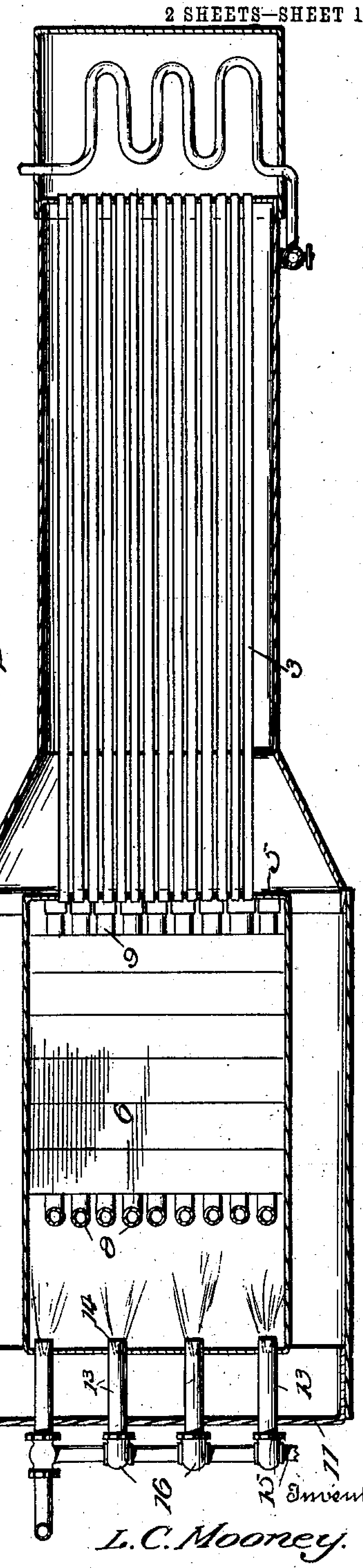


FIG. 2.



Witnesses

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By

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Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON D. C.

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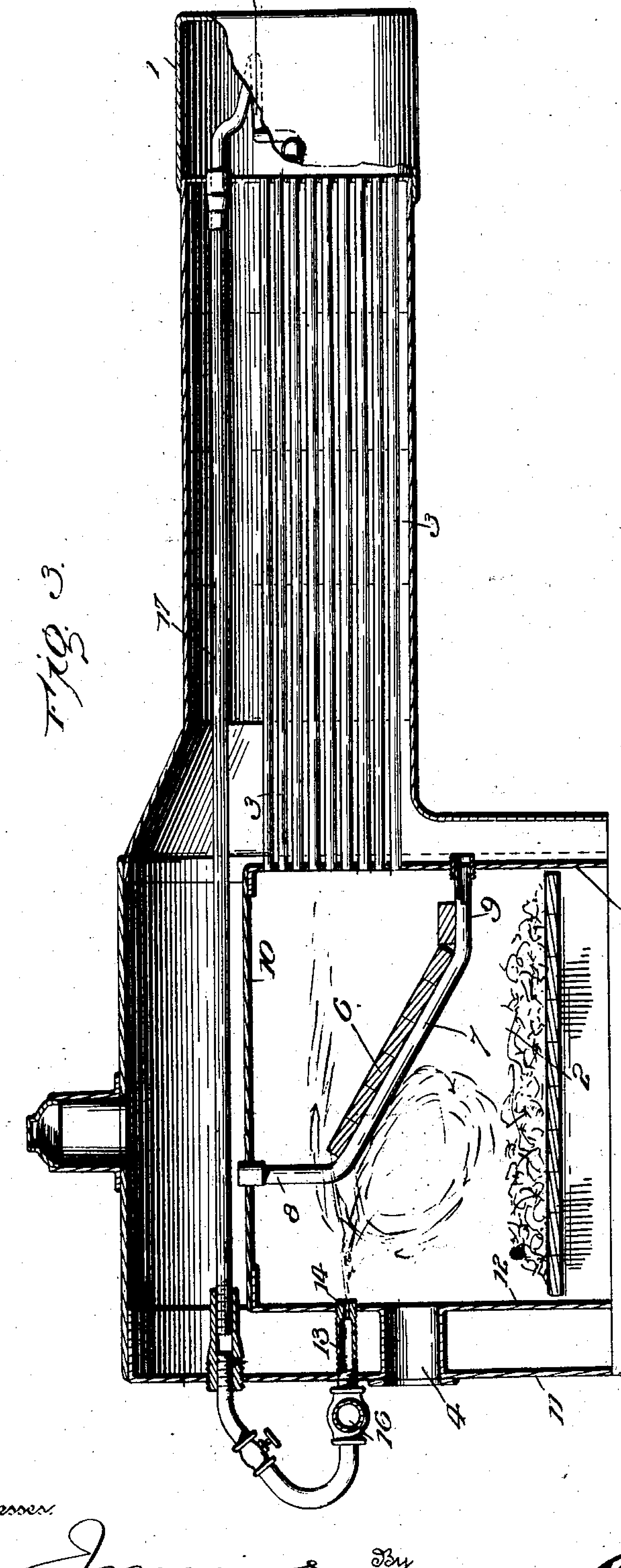

Fig. 3.

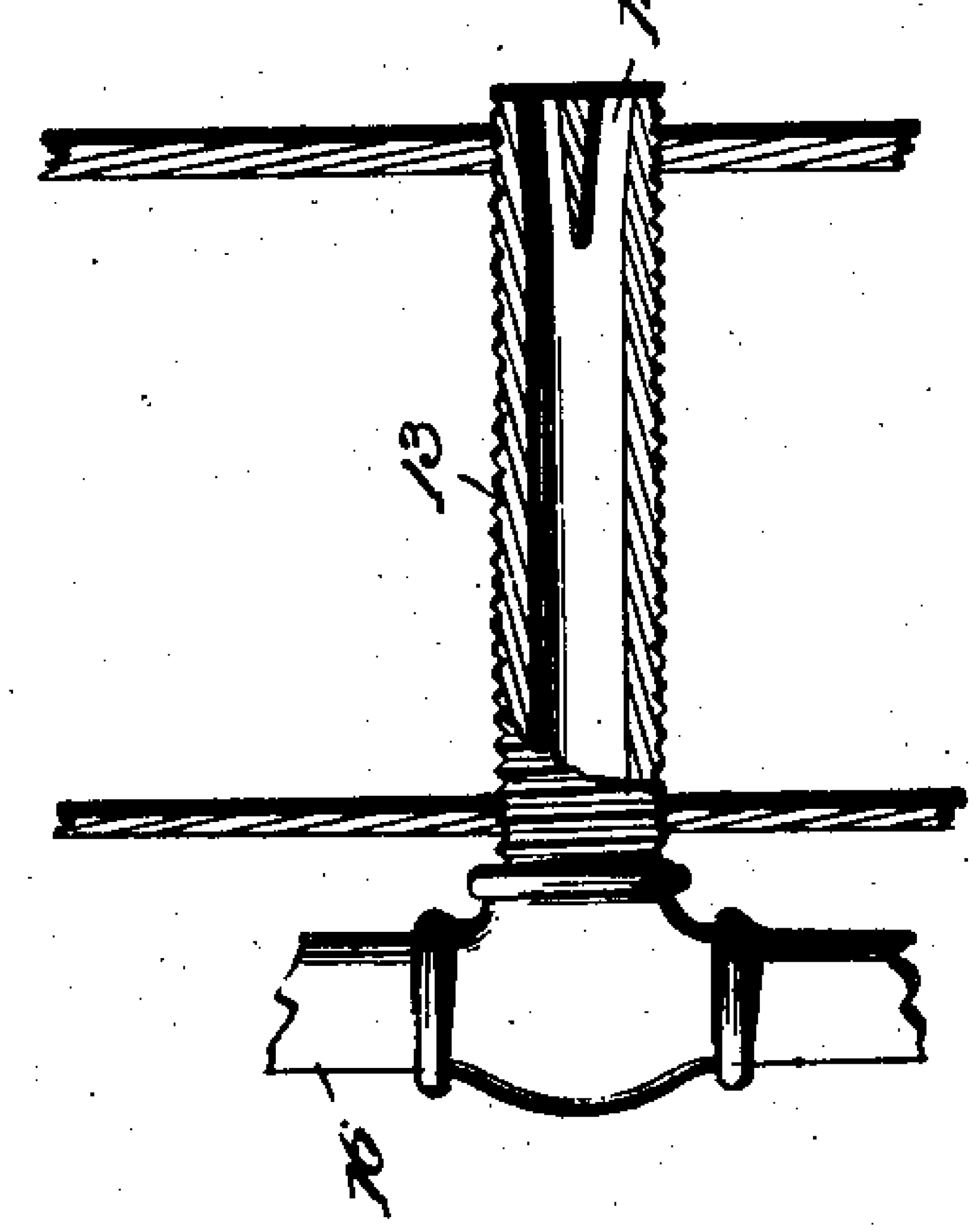

Fig. 4.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 742,208. Patented October 27, 1903.

UNITED STATES PATENT OFFICE.

LAWRENCE C. MOONEY, OF MONTGOMERY, ALABAMA.

SMOKE-CONSUMING FURNACE.

SPECIFICATION forming part of Letters Patent No. 742,208, dated October 27, 1903.

Application filed January 26, 1903. Serial No. 140,632. (No model.)

To all whom it may concern:

Be it known that I, LAWRENCE C. MOONEY, a citizen of the United States, residing at Montgomery, in the county of Montgomery and State of Alabama, have invented certain new and useful Improvements in Smoke-Consuming Furnaces, of which the following is a specification.

This invention relates to means to assist perfect combustion, thereby economizing in fuel and preventing the giving off of dense clouds of smoke, which is highly objectionable in cities and towns. The invention also intensifies the heat, whereby it is possible to obtain a greater amount of steam from a given quantity of fuel in a definite period of time.

The invention is designed for all types of furnaces, whether portable or stationary, vertical or horizontal, and enables the successful use of any kind of fuel.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and drawings hereto attached.

While the essential and characteristic features of the invention are susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side view of a locomotive-boiler embodying the invention. Fig. 2 is a plan section about on the line X X of Fig. 1. Fig. 3 is a vertical central longitudinal section. Fig. 4 is a detail view showing a nozzle on an enlarged scale.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The invention, while applicable to any pattern of steam-boiler furnace, is illustrated in connection with a boiler of the locomotive type, since it is primarily designed for this particular style of boiler. The locomotive-boiler is of ordinary construction and is provided at one end with a smoke-chamber 1 and at the opposite end with the fire-box 2, the intermediate portion 3 being occupied by the bank of flues or tubes. The fire-box is surrounded at its top and four sides by a water-space in the accustomed manner, the fuel being fed through the door-opening 4 in the end wall. A series of water-tubes span the angle formed between the crown-sheet of the furnace and the wall 5 and communicate at their ends with the water-space, so as to establish circulation. These water-tubes support tiles 6, of refractory material, constituting a baffle. The intermediate portion 7 of the water-tubes inclines, and the terminal portions are bent to extend vertically, as shown at 8, and horizontally, as shown at 9, and are firmly joined to the crown-sheet 10 and wall 5 in the usual manner.

The end wall of the furnace, provided with the door-opening 4, comprises the spaced plates 11 and 12 and is provided with a series of nozzles 13, extended across the space and joined to the plates 11 and 12 in any substantial manner. The inner ends of the nozzles are provided with diverged openings 14, through which the smoke-consuming medium escapes in diverged jets. The nozzles 13 are arranged in a horizontal line and about in the plane of the topmost tile or upper portion of the baffle, whereby the jets are deflected downwardly and create an eddy, as indicated by the arrows in Fig. 3. Hot air and steam are supplied to the nozzles, the steam-pipe 15 being connected at one end with the steam-dome of the boiler and at its opposite end with one of the headers 16, from which the nozzles 13 extend. The hot-air pipe 17 extends through the steam-space of the boiler and is connected at one end with a radiator or coil 18, arranged in the smoke-space 1, and at its opposite end with the other end of the header 16. Cold air is supplied to the coil 18 by means of a pipe 19, terminating at any desired or selected point. The several pipes are provided with valves for regulating the supply of air and steam to the nozzles in proportionate quantities or for shutting off the same when desired.

In the operation of the invention cold air from a point exterior to the boiler is supplied to the radiator or coil 18 and is heated by the waste products of combustion through the smoke-space to the stack, the air from the coil being further heated in its passage through the pipe 17, located in the steam-space of the boiler and entering the header

16, where it is met and commingles with steam supplied to said header by means of the pipe 15 in the manner stated. The steam and air are mixed in the header and are delivered into the combustion-chamber of the fire-box in jets and, striking the baffle, which has been intensely heated practically to a point of incandescence, promotes combustion of the particles of free carbon by direct contact therewith, whereby as a result little or no smoke or carbon passes off from the stack and the gases are united, and thereby intense heat is the result.

The inclination of the baffle and the relative arrangement of the nozzle thereto are essential features to the successful operation of the invention.

Having thus described the invention, what is claimed as new is—

In a steam-boiler furnace, having a fire-box at one end and a smoke-space at the other end, a coil located in the smoke-space, and means for supplying cold air to the said coil, a header disposed adjacent the fire-box, a hot-air pipe extending through the steam-space of the boiler and connecting the coil and header, a pipe connecting the header with the steam-dome of the boiler, a series of water-tubes disposed within the fire-box having their ends connected with the crown-sheet and one of the vertical walls and having the intermediate portions thereof inclined and the terminal portions bent to extend respectively in vertical and horizontal directions, tiles supported above the said tubes and along the inclined portions thereof, nozzles inwardly extended from the header aforementioned and into the combustion-chamber of the fire-box, said nozzles being arranged to deliver jets against the upper portion of the water-tubes within the fire-box, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

LAWRENCE C. MOONEY. [L. S.]

Witnesses:

LEW A. SANDERSON,

BENJ. KREW.