

(No Model.)

W. STUBBLEBINE.

PUDDLING AND HEATING FURNACE.

No. 300,657.

Patented June 17, 1884.

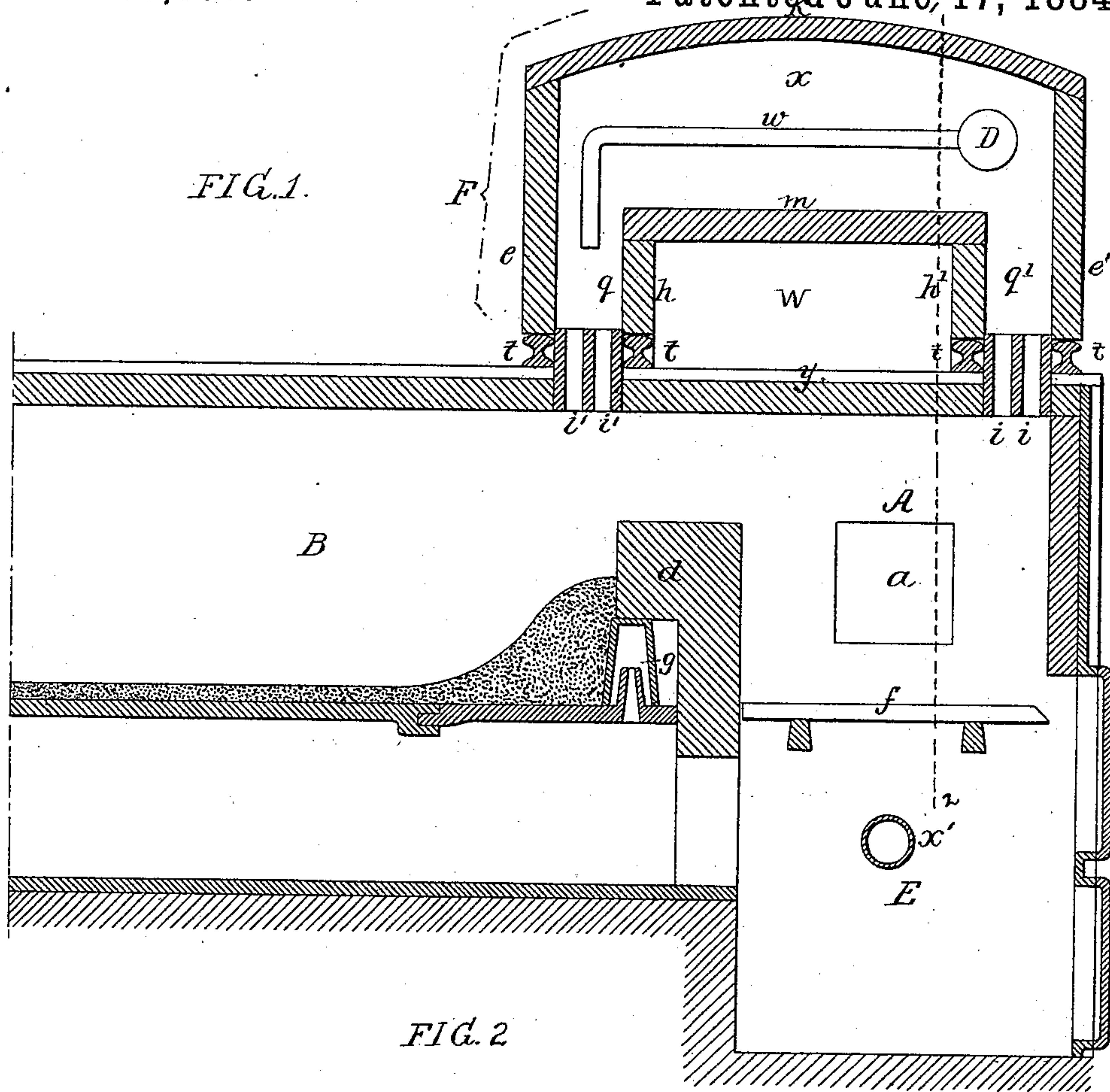
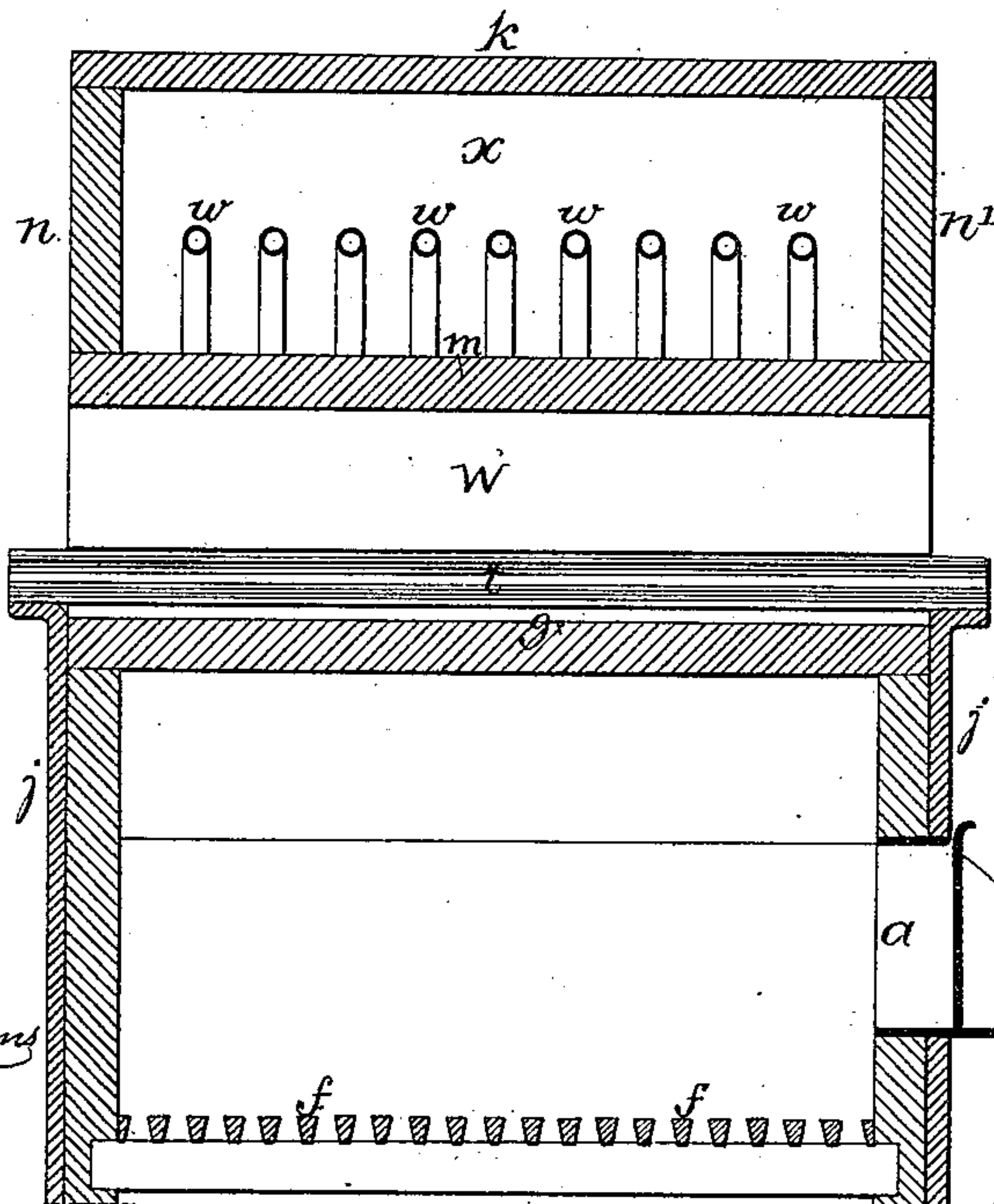


FIG. 2



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM STUBBLEBINE, OF BETHLEHEM, PENNSYLVANIA, ASSIGNOR TO
THE STUBBLEBINE PATENTS COMPANY, OF SAME PLACE.

PUDDLING AND HEATING FURNACE.

SPECIFICATION forming part of Letters Patent No. 300,657, dated June 17, 1884.

Application filed October 8, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM STUBBLEBINE, a citizen of the United States, and a resident of Bethlehem, Northampton county, Pennsylvania, have invented certain Improvements in Puddling and Heating Furnaces, of which the following is a specification.

My invention relates to certain improvements in the puddling and heating furnace for which Letters Patent No. 226,368 were granted to myself and B. C. Lauth, April 6, 1880; and the objects of my improvements are, first, to maintain the structure above the fire-place, as well as the roof of the latter, in a comparatively cool condition, and thereby prevent their rapid destruction; and, second, to increase the heating capacity of the furnace by discharging the products of combustion, mixed with air, from the said structure at or near the bridge-wall.

In the accompanying drawings, Figure 1 is a vertical section of part of a puddling or heating furnace, showing my improvements; and Fig. 2, a transverse vertical section on the line 1 2, Fig. 1.

A is the fire-chamber of the furnace; B, the puddling or heating chamber; E, the ash-pit; f, the grate; d, the bridge-wall, and g the hollow chills surrounding the bed of the furnace. A structure, F, is built on the roof of the furnace, in which are openings *i i*, for the passage into the said structure of a portion of the gases evolved from the fuel, accompanied with more or less flame of a character indicating incomplete combustion, these gases, intermixed with jets of air from a blast-pipe, escaping in forcible jets through outlets *i' i'*. This description will apply to the furnace described in the aforesaid patent, in which, however, the said outlets *i' i'* were above the fire-place and in front of the bridge-wall. I have found in practice that this is not the best position for the outlets, and that much better results are attained by locating them in the position shown in Fig. 1—that is, at and near the rear of the bridge-wall.

Another feature of my invention relates to the structure F, which in the aforesaid patent inclosed a gas-chamber, the bottom of which was the roof of the furnace. As the external

air could not gain access to the portion of the roof covered by the structure, there was a rapid destruction of the brick-work of the said roof, owing to the intense heat to which it was subjected. In order to obviate this difficulty, I make the structure in the manner shown in the drawings. It has opposite end walls, *e e'*, terminating at the roof *k*, and two inner walls, *h h'*, extending to a partition, *m*, which may be composed of suitable slabs supported by the said inner walls and by any appropriate bars. The opposite side walls, *n n'*, complete the structure which incloses the two passages, *q q'*, and gas-chamber *x*, communicating therewith. The side walls, however, do not inclose the space, W, bounded by the roof *y* of the fire-chamber of the furnace, the partition *m*, and the walls *h h'*, the said space being open to the atmosphere, and thus the roof *y* of the fire-chamber and the partition *m* are maintained in a comparatively cool condition.

I prefer to support the walls of the structure on metal beams *t*, which rest on the side plates, *j j*, of the furnace, and are free from contact with the roof *y*.

The openings *i i* are made in slabs or tiles, which extend upward into the passage *q'* and downward through the roof *y* of the fire-chamber, and the openings *i' i'*, being made in similar slabs or tiles, extending into the passage *q* and down through the roof of the furnace at or near the rear of the bridge-wall.

A blast-pipe, D, extends into the gas-chamber *x* of the structure, and attached to this pipe, and communicating therewith, are several branch pipes, *w*, so bent at their ends as to direct jets of air into the passage *q*. I do not, however, desire to restrict myself to this mode of introducing air into the structure, for other available devices may be used. They should, however, be such in all cases that the escaping jets of air will induce a portion of the unconsumed gases evolved from the fuel to pass through the openings *i i*, thence up the passage *q'*, and through the gas-chamber *x* and passage *q*, the escaping jets of air being intimately mixed with the gases, and the combined air and gases passing into the furnace at or near the rear of the bridge-wall, where they are met by the main volume of the pro-

ducts of combustion from the fire-place, the result being the effectual consumption of the said products and an intense heat at the point where it will be most available. Air under
5 pressure for the desired blast may be derived from any blowing mechanism, or may be produced by the well-known ejector-blower, in which a jet of steam induces the air to enter a pipe. There should be a blast-pipe, x' , terminating in the ash-pit; but this forms no part
10 of my present invention.

My improvements are not restricted to the puddling or heating furnaces of rolling-mills, but may be applied to the furnaces of steam-
15 boilers, &c.

I claim as my invention—

1. The combination, with a furnace, of the following elements, namely: first, a gas-chamber, x ; second, openings $i i$, forming communication between the said chamber and the
20 fire-chamber of the furnace near the front of the same; third, openings $i' i'$, terminating at or near the rear of the bridge-wall, and, fourth, a blast-pipe communicating with the gas-chamber, all substantially as set forth.
25

2. The combination, with a furnace, of a

structure which is elevated above the roof y , so as to leave an opening, W , and which contains a gas-chamber, x , and passages $q q'$, communicating with openings $i i'$, substantially as
30 specified.

3. The combination, with a furnace, of the structure F , containing the chamber x and passages $q q'$, with beams t , bearing on the side plates or side walls of the furnace and supporting the said structure, and with slabs or
35 tiles presenting openings $i i$ and $i' i'$, substantially as described.

4. The combination, with a furnace, of the structure F , containing the chamber x and
40 passages $q q'$, communicating with the interior of the furnace, and the blast-pipe D , having branches w , directed at the ends into or toward the passage q , as set forth.

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

WILLIAM STUBBLEBINE.

Witnesses:

JOHN E. PARKER,
HARRY SMITH.