No. 692,782. Patented Feb. 4, 1902.

H. G. COX.

SMOKE CONSUMING FURNACE.

(Application filed Oct. 23, 1901.)

(No Model.)

Fig. 1.

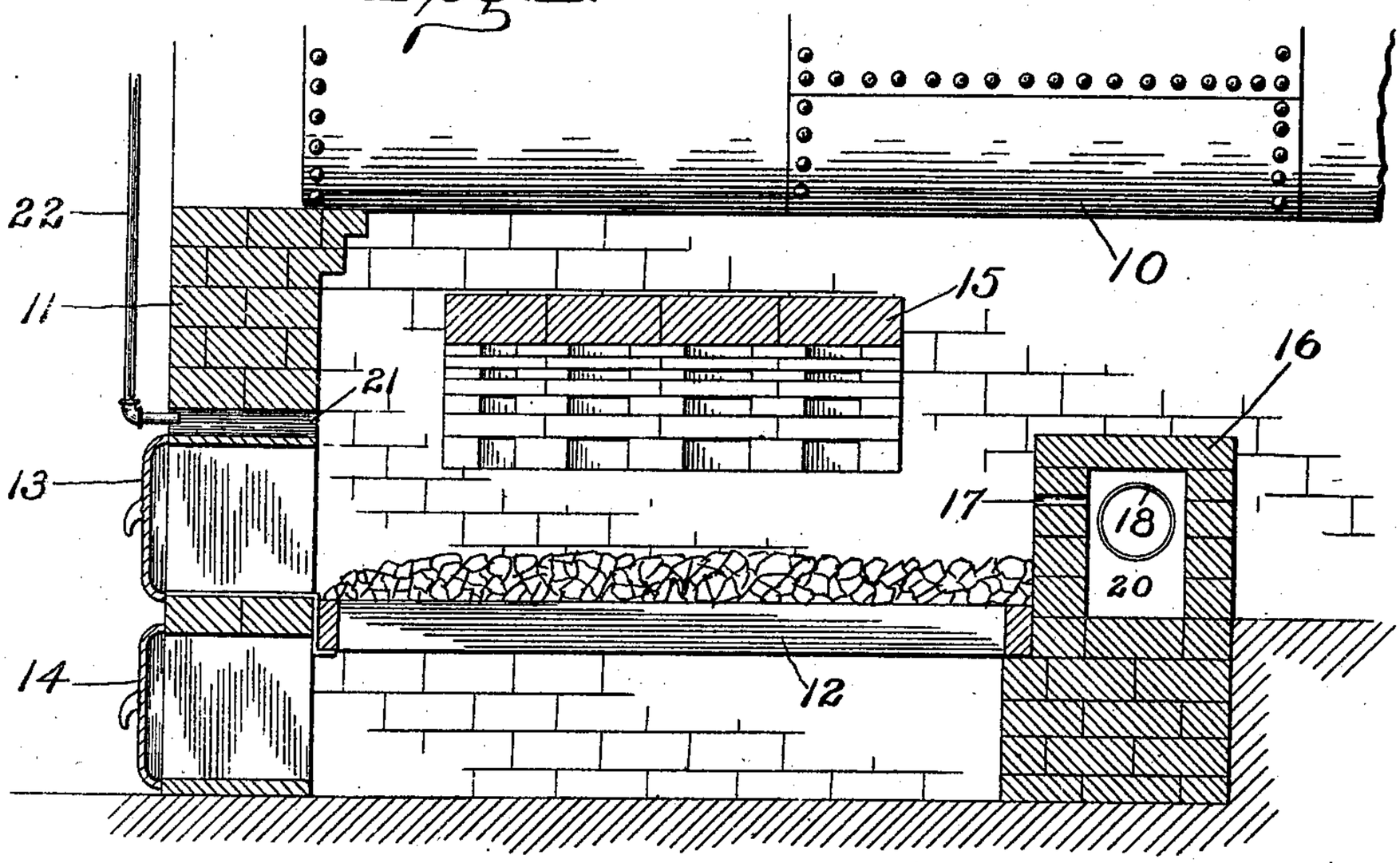
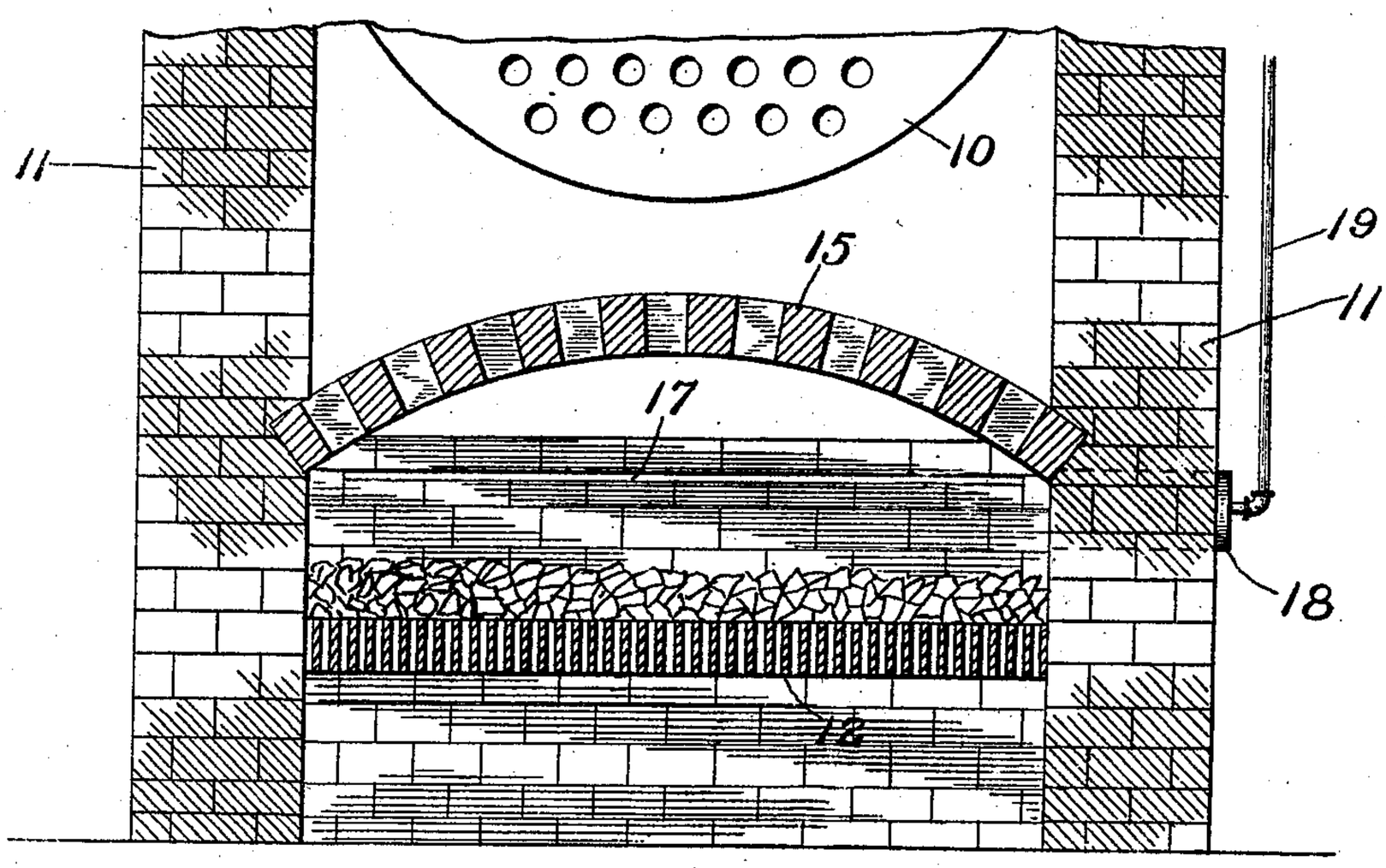


Fig. 2.



WITNESSES:
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SMOKE-CONSUMING FURNACE.

SPECIFICATION forming part of Letters Patent No. 692,782, dated February 4, 1902.

Application filed October 23, 1901. Serial No. 79,659. (No model.)

To all whom it may concern:

Be it known that I, HENRY GRANDISON COX, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Smoke-Consuming Furnaces, of which the following is a specification.

The object of my said invention is to produce a furnace in which smoke as it rises from the fuel shall be subjected to such an intense and active heat as to consume all the carbon therein, leaving as the final product of combustion, which escapes through the flues, only a substantially colorless gas containing practically no heat-producing qualities.

Said invention consists in a suitable arch or roof directly above the fuel-carrying grate or floor and means for producing air-currents to be driven in from opposing directions thereunder.

A furnace embodying my said invention will be first fully described, and the novel features thereof then pointed out in the claims.

Referring to the accompanying drawings, which are made a part hereof, and on which similar reference characters indicate similar parts, Figure 1 is a longitudinal sectional view of so much of a furnace embodying my said invention as is necessary to illustrate the same, and Fig. 2 a transverse sectional view thereof.

The furnace illustrated is such as is used with steam-boilers, and such a boiler 10 is shown as mounted in brickwork 11 in the usual way. A fuel-carrying grate 12 (of an ordinary form) is located in the combustion-chamber, and doors 13 and 14 are provided for the introduction of fuel and the removal of ashes, as is common. Centrally above the fuel-grate and extending over the greater portion thereof is the roof or arch 15, preferably built of fire-brick and located between the grate and the boiler. This roof or arch is open at two sides, preferably at the front and the rear, leaving suitable spaces for the passage of the products of combustion. It also is preferably laid up in open-work, as shown, leaving numerous perforations therethrough. Being located quite near the fuel, this roof or arch quickly attains a very high heat after the fire has been started.

The bridge-wall 16 is hollow and contains a long slit 17 (or equivalent perforations) in its front side at a point above the body of fuel in the combustion-chamber and below the roof or arch 15. An air-tube 18 leads out to a point where a supply of air may be obtained. Air is forced into the chamber in the bridge-wall by any suitable means. I have shown a small steam-pipe 19, the end of which turns into the tube 18 and acts as an injector. An air-pump or any other suitable means may, however, be employed which will maintain a pressure in the chamber 20 in the bridge-wall. The air is of course heated to a considerable degree in passing through this chamber.

At a point opposite to the slit 17 is a corresponding opening or openings 21, and a steam-pipe 22 (arranged and operating similarly to the steam-pipe 19) is provided to force the air in at that point. The jets of air which enter through the openings 17 and 21 meet beneath the arch or roof 15, with the result that the products of combustion rising from the fuel are violently agitated and thoroughly commingled with the air, and under the intense heat existing at that point the carbon or smoke is thoroughly consumed. This result is largely due to the intensely-heated condition of the roof or arch itself. The products of combustion finally escape up against the boiler or whatever is to be heated through the orifices in the roof or arch and to some extent around its ends or sides. Practical use of a furnace constructed in accordance with my invention has demonstrated its high efficiency.

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

1. The combination, in a furnace, of the usual grate-bars and walls, an arch extending between said walls over said grate-bars and having its ends open thereby permitting the passage of the products of combustion around both of said ends, a hollow bridge-wall beyond the rear end of said arch into which the air is admitted from the outside and wherein it is heated, openings in said bridge-wall leading from the chamber therein toward the front end of the furnace at a point

below the arch, and other openings in the front wall of the furnace leading directly oppositely thereto, whereby currents of air are discharged into the combustion-chamber below said arch thus producing violent conflicting air-currents and thoroughly agitating the products of combustion which are thereby caused to be more perfectly consumed and which pass up through and around both ends of the arch into contact with the boiler to be heated, all substantially as shown and described.

2. The combination, in a furnace, of the usual walls and fuel-carrying grate, an open-ended and perforated arch or roof above said grate between it and the thing to be heated, a hollow bridge-wall into which air is admitted from the outside and wherein it is heated provided with suitable openings leading from the chamber therein into the combustion-chamber, other openings leading from the opposite direction into said combustion-chamber, and means for forcing in air through said openings and thus producing conflicting air-currents below the roof or arch, substantially as and for the purposes set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 15th day of October, A. D. 1901.

HENRY GRANDISON COX. [L. S.]

Witnesses:
CHESTER BRADFORD,
C. S. FRYE.