

No. 667,970.

Patented Feb. 12, 1901.

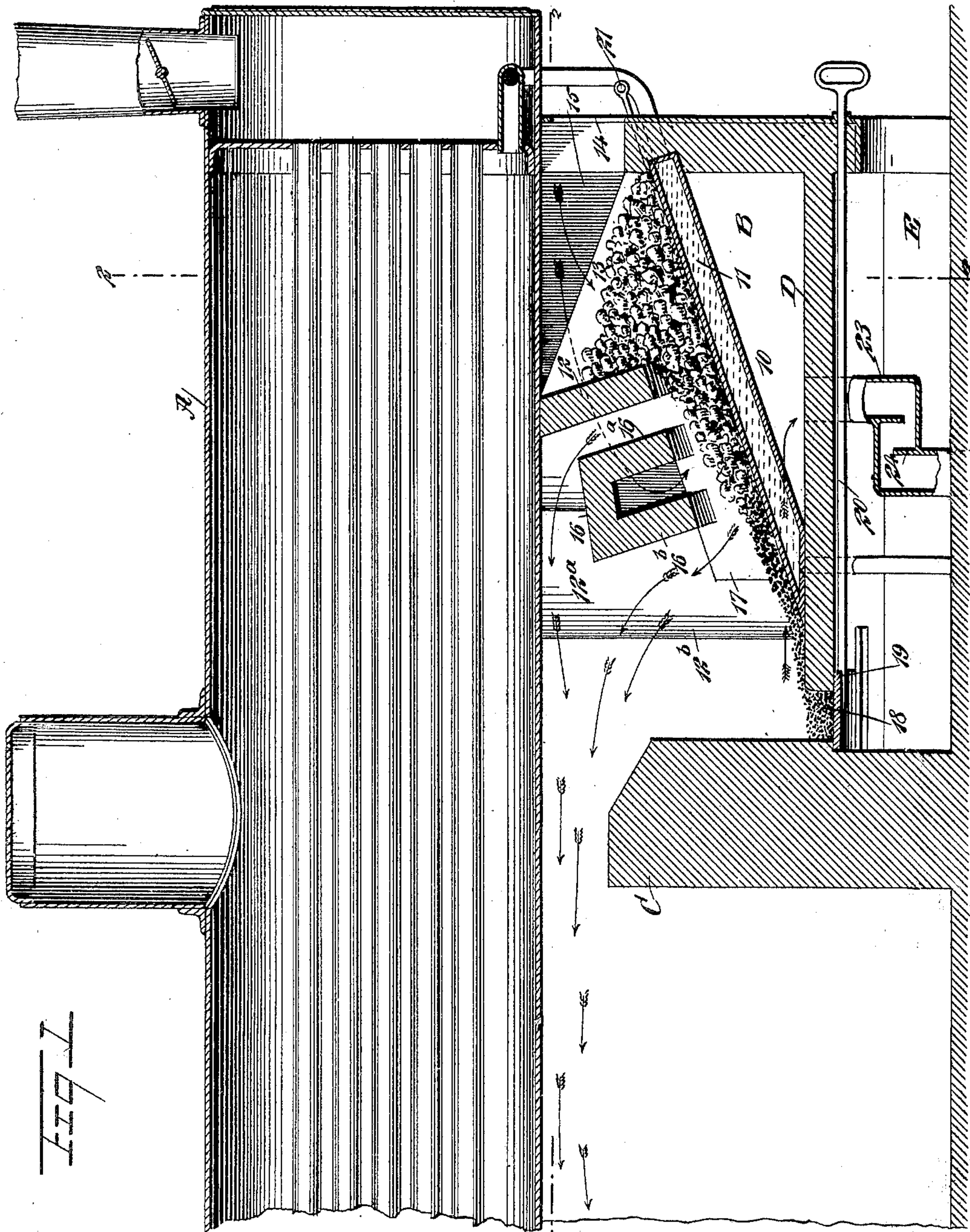
G. CHANTLER.

FIRE BOX FOR BOILERS OR FURNACES.

(Application filed Mar. 24, 1900.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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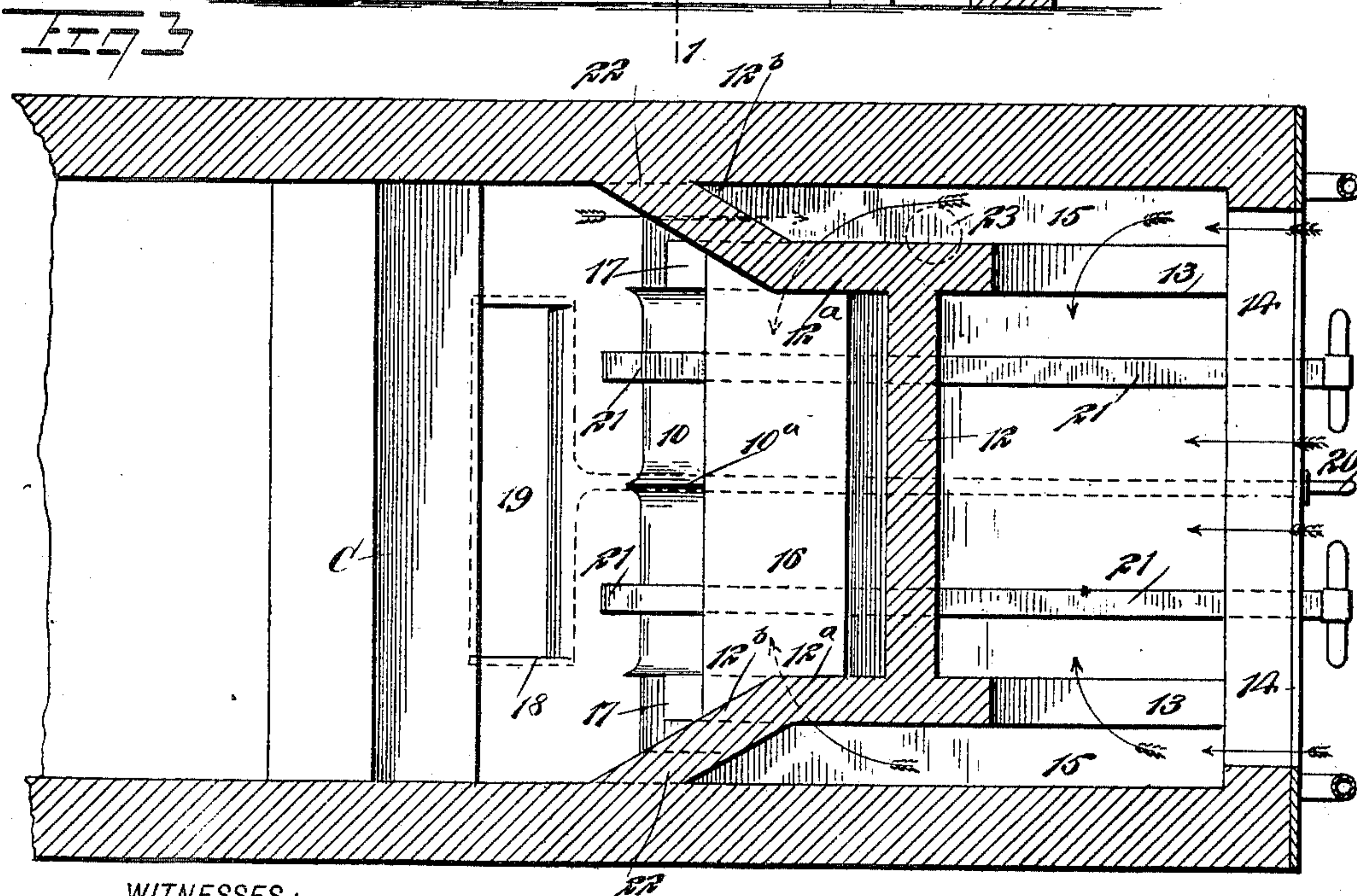
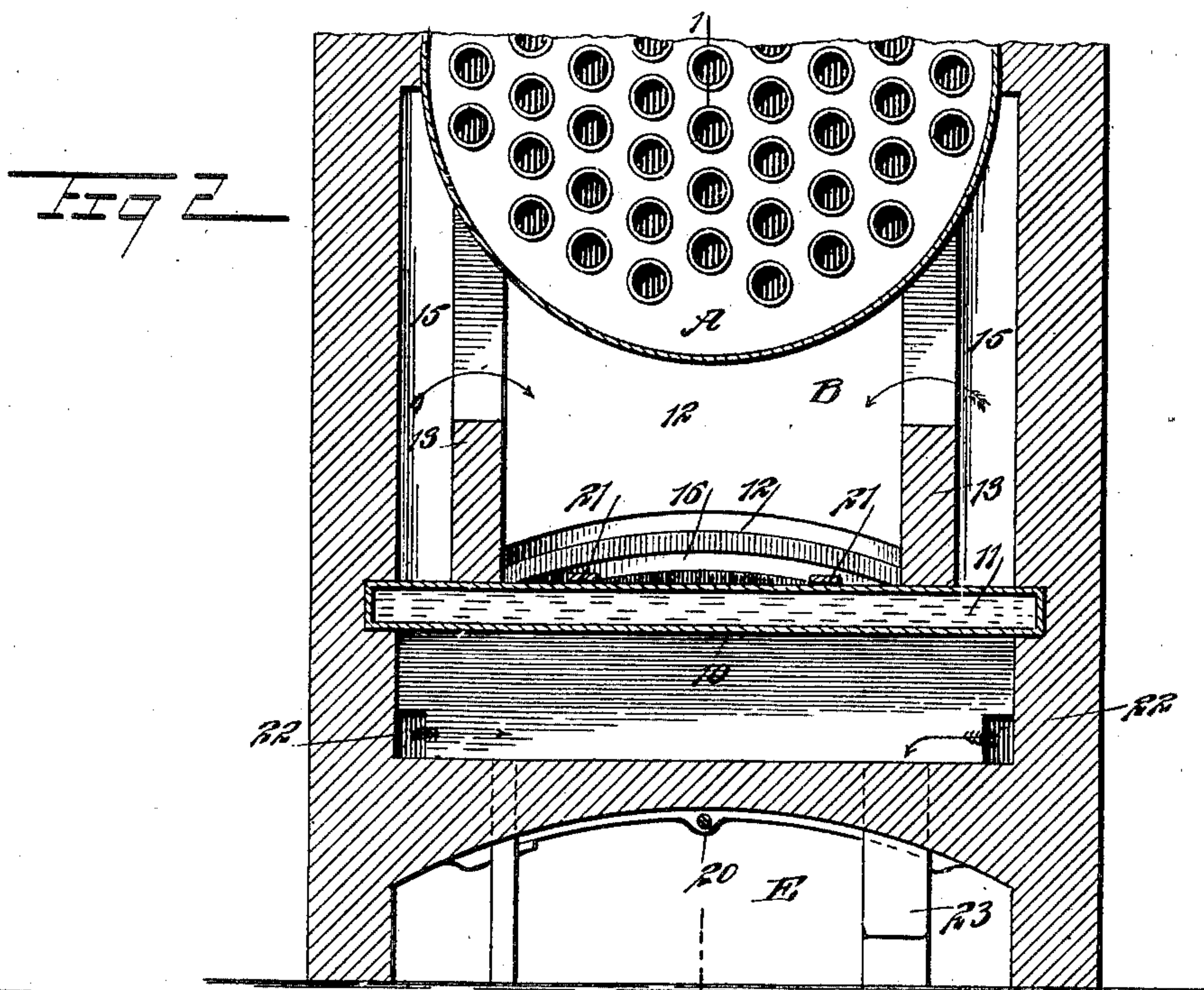
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

GEORGE CHANTLER, OF CHICAGO, ILLINOIS.

FIRE-BOX FOR BOILERS OR FURNACES.

SPECIFICATION forming part of Letters Patent No. 667,970, dated February 12, 1901.

Application filed March 24, 1900 Serial No. 10,022. (No model.)

To all whom it may concern:

Be it known that I, GEORGE CHANTLER, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Fire-Boxes for Boilers or Furnaces, of which the following is a full, clear, and exact description.

One object of this invention is to provide a perfect consumption of coal and to retain the coal at a point near the front of the furnace or boiler until the maximum heating capacity of the coal has been exhausted and freely supply air to this mass of coal in such manner that the currents of air will produce the best possible results.

Another purpose of the invention is to provide an inclined support for the bed of coal and means whereby after the initial burning of the coal the resultant coke will pass down to the lower point of the inclined support and be supplied with oxygen to such an extent that all the heating qualities of this second mass will be effectually obtained therefrom.

A third purpose of the invention is to provide a means for the convenient passage of the cinders and ashes from the mass of fuel and for the convenient disposition of such products.

Another purpose of the invention is to provide means whereby the waste gases resultant from combustion—as, for example, dioxide—will be conducted from the fire-box to a point below the support for the fuel and out through and beyond the structure.

Another purpose of the invention is to provide a support for the material to be consumed, so constructed that the said support will contain water, thus promoting the lifetime of the support for the fuel.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

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 longitudinal vertical section through a portion of a boiler and the improved fire-box applied thereto, the section being taken practically on the line 1 1 of Fig. 2.

Fig. 2 is a vertical section taken practically on the line 2 2 of Fig. 1, and Fig. 3 is a horizontal section taken substantially on the line 3 3 of Fig. 1.

A represents a boiler having a suitable mount; B, the fire box or pot for the boiler; C, the rear wall of the fire-box; D, the bottom of the fire-box, and E the ash-pit thereof. The support 10, upon which the fuel is to rest, is inclined and extends as an imperforate partition from the front upper portion of the fire-box B to a point near the rear, the rear end of said fuel-support 10 having a bearing on the bottom D of the fire-box. This fuel-support 10 is tubular or hollow, so that a central chamber 11 is obtained, which is adapted to be filled with water, and under such a construction the fuel-support 10 is prevented from wearing out as quickly as if it were of solid construction, since the water serves in a measure to chill the outer faces of the support.

A longitudinal chamber 15 is formed at each side of the fuel-support 10, and the said chamber extends any suitable distance beyond the said fuel-support, and the outer wall of the boiler-mount serves as the outer wall for the chambers 15, while the inner wall of these chambers consists of inclined cheek-pieces 13, which extend from an air-opening 14 in the front of the fire-box to a point near its center, the lower portions of the cheek-pieces 13 being at the front, and the air-inlet opening 14 of the fire-box is never closed, so that air will constantly enter said fire-box. The rear portion of the inner walls of the chambers 15 is formed by uprights 12^a, which may be of brick or of other material, and the rear ends of these inner walls 12^a are given an inclination in direction of the outer walls, as illustrated at 12^b in Figs. 1 and 3. Side plates 17 are usually erected at each side portion of the fuel-support 10, extending upward therefrom and forming guides for the fuel, and between the front and rear portions of the fire pot or box a transverse bridge or barrier 12 is constructed, extending from the inner wall of one chamber 15 to the corresponding wall of the opposing chamber. The bottom of this bridge or barrier 12 is arched or recessed, so as to provide a means for the fuel to pass beneath it in limited quantities,

as the bulk of the fuel is adapted to lie in front of the bridge or barrier 12 and be supported thereby. A second and double bridge or barrier 16 is located at the rear of the front or single bridge or barrier 12. This double bridge or barrier is substantially U-shaped in cross-section and its side members 16^a and 16^b are usually concaved at their bottom surfaces. The double bridge or barrier 16 extends from one chamber 15 to the other and the space between the members of the double bridge or barrier is in communication with the interior of said chambers 15.

An opening 18 is formed in the bottom D of the fire pot or box B, adapted to receive the ashes and cinders. This outlet-opening 18 for the cinders is controlled by a slide 19 or its equivalent, having a rod 20 attached thereto, usually at its center, which rod extends out to the front of the fire box or pot, as shown particularly in Fig. 1. The rod 20 is located in the ash-pot E. Ordinarily the upper face of the fuel-support 10 has longitudinal ribs 10^a made thereon, so as to divide the mass of fuel held on the support, and also in order that the body of fuel may be shifted on its support 10 bars 21 are held to slide longitudinally upon the upper face of the support, as illustrated in Figs. 2 and 3, and the handles of these bars extend out at the front portion of the fire box or pot.

In operation the air enters the fire box or pot in volume at the opening 14, and consequently constantly supplies oxygen to the mass of fuel at the front of the fire-box and in front of the single bridge 12. The fuel is not entirely consumed at the front of the fire-box, and the partially-consumed material slides down on the support 10, beneath the double bridge 16, and receives a fresh supply of oxygen by means of air entering the chambers 15 through the front opening 14 in the fire-box and passing into the space between the lower members of the double bridge. This fresh supply of oxygen greatly facilitates combustion; and it has been found in practice that the fuel is thus reduced to fine cinders and ashes. These cinders and ashes gradually find their way to the outlet-opening 18. The dioxide finds its way to the rear portion of the fire-box, falling to the bottom thereof, and passes forward through openings or flues 22 to the forward portion of the fire-box beneath the fuel-support 10 and then enters an off-take pipe 23 leading outside of the furnace structure, which pipe may be and preferably is provided with partitions 24. (Shown in Fig. 1.)

I desire it to be understood that the improved fire box or pot may be used in connection with stoves, ranges, or any article in which coal is burned.

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

1. A fire-box, comprising an imperforate fuel-support 10 inclined with its front end highest and constructed with a water-space, fuel-stirring bars 21 arranged thereon, a horizontal bottom D supporting the rear end of the fuel-support and provided with opening 18 at its back end, a closing-slide 19 arranged below said opening and having a rod extending to the front, a pendent fuel-abutment arranged above the fuel-support, and an air-chamber arranged behind the fuel-abutment substantially as and for the purpose described.

2. A fire-box comprising an imperforate fuel-support 10 inclined with its front end the highest and made with a water-space, a horizontal bottom D sustaining the rear end of the fuel-support and having an opening 18 beyond the same, fuel-retarding devices arranged above the support, an air-chamber arranged behind the fuel-retarding devices, and air-channels arranged on each side of the fuel-support and communicating at the rear end with the bottom of the fire-chamber and at the front end with the space between fuel-support 10 and bottom D substantially as described.

3. A fire-box comprising an imperforate fuel-support 10 inclined with its front end the highest and made with a water-space, bars 21 arranged thereon, a horizontal bottom D having an opening 18 at its rear end and an ash-pit below said bottom, an outlet-pipe 22, 23, arranged in said ash-pit and opening into the space beneath the inclined fuel-support, a slide with rod extending to the front, channels being formed on each side of the fuel-support placing the fire-chamber and the space below fuel-support into communication, and fuel-retarding devices and air-supplying devices arranged above the inclined fuel-supports substantially as described.

4. A fire-box having an inlet for fresh air at its upper front end and an inclined fuel-support descending from said fresh-air inlet, a pendent fuel-abutment arranged above the inclined support and retarding the passage of fuel down the same, an air-chamber arranged behind the fuel-abutment and opening downwardly and above the inclined fuel-support, and side chambers arranged upon opposite sides of the fuel-support and communicating with the air-space of the upper end of the fire-box and also with the air-space of the chamber above the inclined fuel-support, substantially as and for the purpose described.

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

GEORGE CHANTLER.

Witnesses:

J. FRED. ACKER,
JNO. M. RITTER.