

No. 767,215.

PATENTED AUG. 9, 1904.

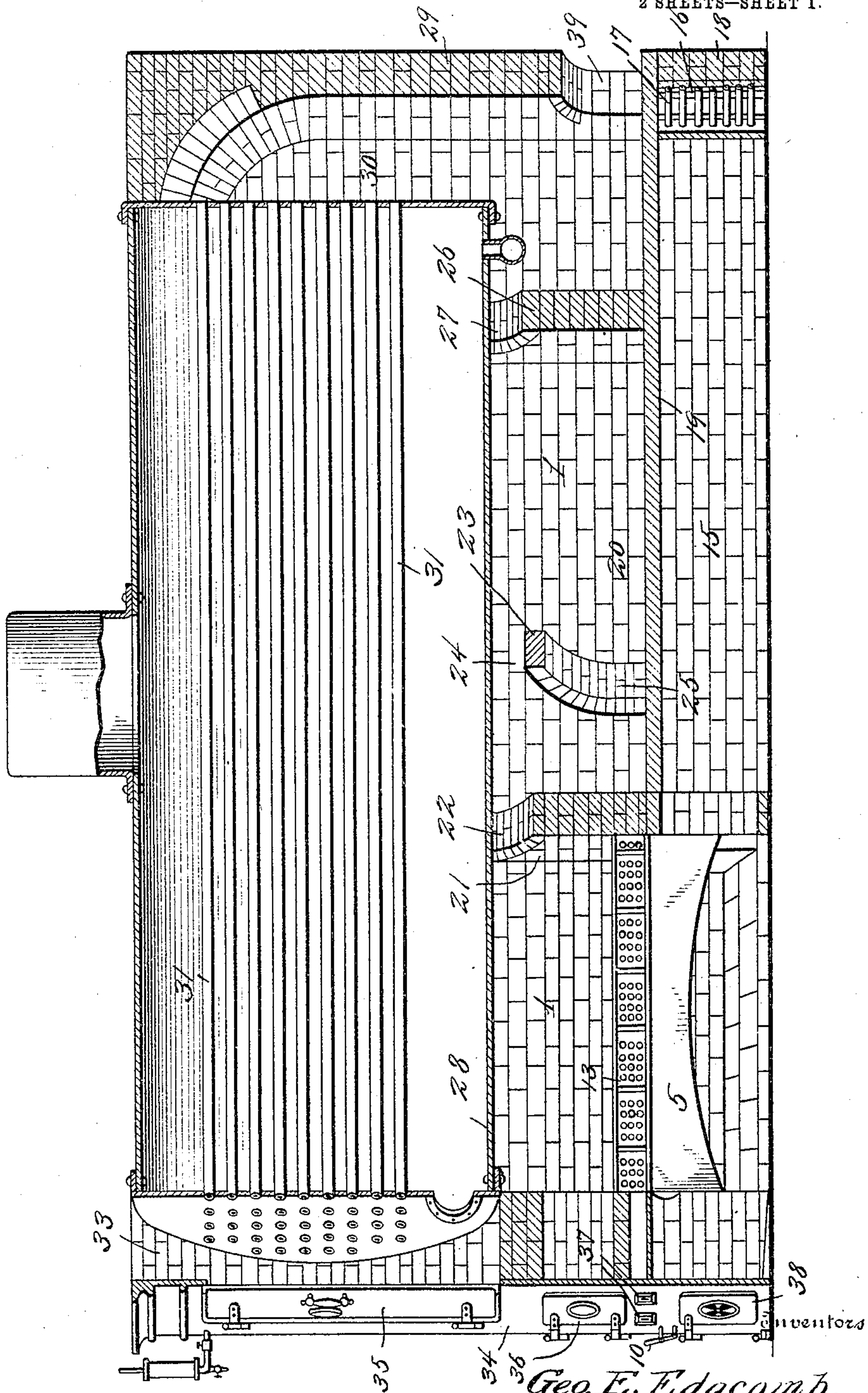
G. E. & B. EDGCOMB & W. D. ELLIS.
SMOKE CONSUMING FURNACE.

APPLICATION FILED AUG. 22, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

FIG. 1.



Witnesses

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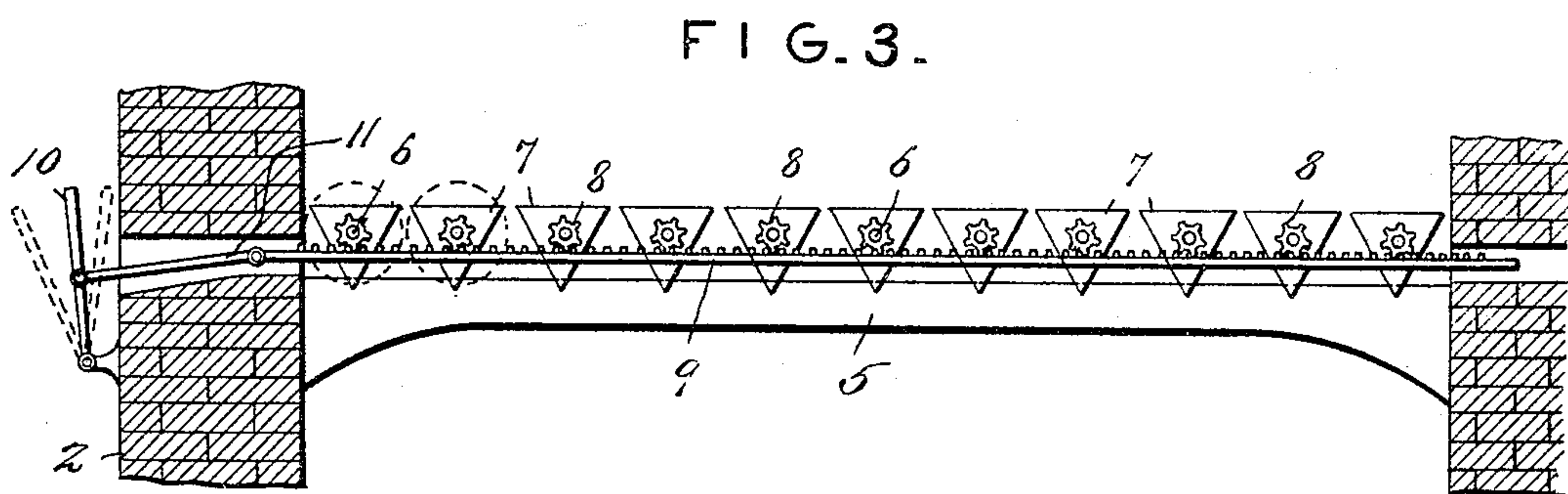
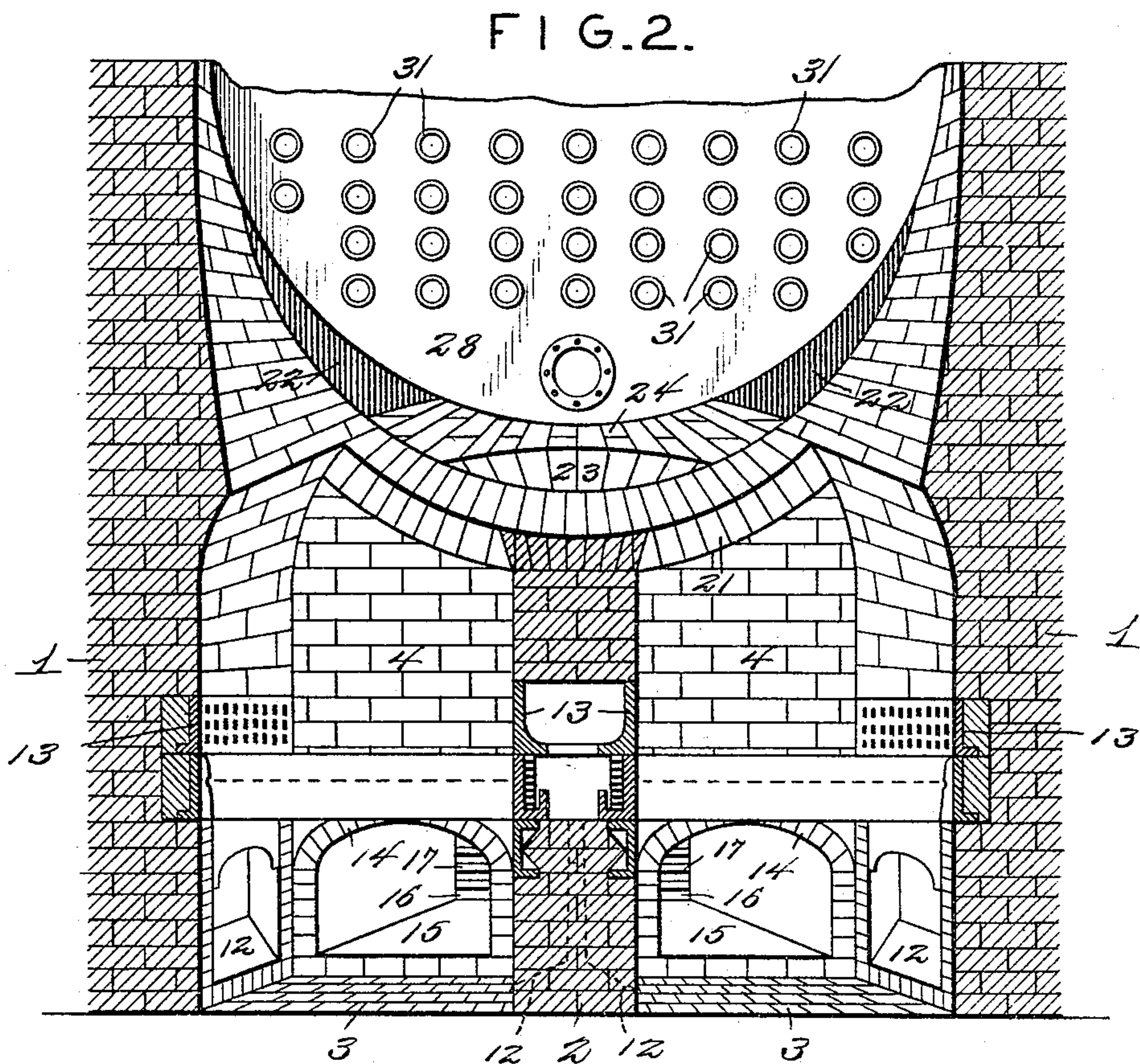
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SMOKE CONSUMING FURNACE.

APPLICATION FILED AUG. 22, 1903.

NO MODEL.

2 SHEETS—SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE E. EDGCOMB, BERT EDGCOMB, AND WILLIAM D. ELLIS, OF
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SMOKE-CONSUMING FURNACE.

SPECIFICATION forming part of Letters Patent No. 767,215, dated August 9, 1904.

Application filed August 22, 1903. Serial No. 170,496. (No model.)

To all whom it may concern:

Be it known that we, GEORGE E. EDGCOMB, BERT EDGCOMB, and WILLIAM D. ELLIS, citizens of the United States of America, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Smoke-Consuming Furnaces, of which the following is a specification.

Our invention relates to new and useful improvements in smoke-consuming furnaces; and its object is to provide a novel arrangement of arches and partitions for retarding the escape of the products of combustion from the fire-box and holding them until all particles are completely consumed.

A further object is to provide novel means for supplying heated air to the fuel in desired quantities.

A further object is to employ a grate of novel construction, whereby ashes, &c., that may accumulate thereon may be readily dumped into the ash-pit.

With the above and other objects in view the invention consists in the novel construction and combination of parts hereinafter more fully described and claimed, and illustrated in the accompanying drawings, showing the preferred form of our invention, and in which—

Figure 1 is a longitudinal section through our improved furnace, showing the various parts in perspective. Fig. 2 is a transverse section therethrough, also showing the parts in perspective; and Fig. 3 is an end elevation of the grate and showing the means for operating the same.

Referring to the figures by numerals of reference, 1 1 are the side walls of the furnace, preferably constructed of masonry and having a vertical longitudinally-extending partition 2 therebetween at the forward end of the furnace. This partition forms two compartments, one at each side thereof, and each compartment contains an ash-pit 3 and a fire-box 4. Grates are interposed between the ash-pits and fire-boxes, and each of these grates is constructed substantially in the manner illustrated in Fig. 3, comprising supporting side bars 5, upon which are journaled trun-

nions 6, extending from the ends of grate-bars 7, which are preferably triangular in cross-section. A gear 8 is secured to the inner trunion of each grate-bar, and all of the gears of each grate mesh with a rack 9, which is slidably mounted within partition 2 and is adapted to be operated by means of a lever 10, pivoted to the front of the furnace and connected to the rack by a link 11. The grate-bars are so spaced apart that when one face of each bar is in a horizontal position a substantially solid unbroken floor is presented. When the lever 10 is moved in either direction, these grate-bars are simultaneously rotated, so as to form slots of desired size between the bars. The side walls of ash-pits 3 have flues 12 formed therein, which serve to conduct air upward to plates 13, having apertures therein. These plates are located directly above and at the ends of the grate-bars and are adapted to direct air upon the fuel arranged on said bars.

Arches 14 are arranged in rear of the ash-pits 3 and open into a hot-air chamber 15, which extends longitudinally of the furnace and has inlets 16 at its rear end, across which extend steam-pipes 17. The inlets 16 are formed at opposite sides of a vertical partition 18, which is arranged at the center of the rear of hot-air chamber 15. Directly over the hot-air chamber and separated therefrom by a horizontal partition 19 is a combustion-chamber 20, which is divided from the fire-boxes 4 by a partition 21, the upper edge of which is concaved to form a passage 22 thereover. Within the combustion-chamber 20 and in rear of partition 21 is an arch 23, having a passage 24 thereover and a passage 25 thereunder. A second partition 26 is located in rear of arch 23, and this partition also has a concaved upper surface which forms a passage 27 thereover.

A boiler 28 of any suitable form is supported within the furnace upon the side walls thereof in any suitable manner, and the bottom of this boiler is arranged at points removed from the upper faces of partitions 21 and 26.

The rear wall 29 of the furnace is so shaped

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as to form a passage 30 therein for conducting the products of combustion from the chamber 20 upward to the rear ends of the tubes 31 in the boiler, and the opposite ends
 5 of these tubes open into a vertically-extending passage 33 at the front end of the furnace, which may be connected in any suitable manner to a stack. (Not shown.)

The front wall 34 of the furnace may be
 10 formed in any suitable manner and preferably has a door 35 to permit of ready access to the front head of boiler 28. Doors 36 are also arranged in the front of the furnace to permit fuel to be placed within the fire-boxes.
 15 Directly below these doors are slides 37, which close apertures through which pokers may be inserted upon the grate-bars. A door 38 is provided for each of the ash-pits, as shown.

In operation steam is conducted to the pipes
 20 17 from the boiler 28 in any suitable manner and will, as is obvious, heat the air as it flows through inlets 16 into hot-air chamber 15. From chamber 15 the air will pass under arches 14 into ash-pits 3 and thence through the flues
 25 12 and plates 13 into the fire-boxes 4. By tilting the grate-bars 7 air may be admitted in desired quantities therebetween. In this manner the draft may be regulated. The products of combustion will pass over the
 30 partition 21, and the heavier products will flow downward and into contact with and under the arch 23. As this arch is thoroughly heated by the fire within the boxes 4, it is obvious that the combustible particles contact-
 35 ing therewith will be thoroughly consumed. Should any of the unburned products escape past the arch 23, they will come into contact with partition 26, and if this partition is also heated by the fire within the boxes 4 it will
 40 retain the heavy particles until they are consumed. The lighter products of combustion will, as is obvious, flow outward over arch 23 and partition 26 into passage 30 and thence through tubes 31 to the outlet-passage 33.
 45 By providing partitions and arches in the manner herein described it will be seen that all unconsumed particles escaping from the fire-boxes will be consumed prior to their discharge from the furnace.

50 An opening 39 may, if desired, be arranged at the rear end of the combustion-chamber 20, so as to permit access to be had to the inte-

rior of said chamber for the purpose of cleaning or repairing the same.

In the foregoing description we have shown 55 the preferred form of our invention; but we do not limit ourselves thereto, as we are aware that modifications may be made therein without departing from the spirit or sacrificing any of the advantages thereof, and we there- 60 fore reserve the right to make such changes as fairly fall within the scope of our invention.

Having thus described the invention, what is claimed as new is— 65

1. The combination with the walls of a furnace, and a boiler; of a longitudinally-extending horizontal partition between the walls and forming a hot-air chamber having an inlet at one end, an ash-pit at the other end of said 70 chamber, air-heating means within the inlet, a fire-box above the ash-pit, flues within the walls and opening at opposite ends into the ash-pit and fire-box, respectively, and a combustion-chamber above the hot-air chamber. 75

2. The combination with the walls of a furnace having a boiler therebetween; of a longitudinally-extending partition forming a compartment at each side thereof, grates within said compartments forming fire-boxes and 80 ash-pits, a longitudinally-extending horizontal partition within the furnace forming a hot-air chamber communicating with the ash-pits, air-heating means within said compartment, a combustion-chamber formed by the hori- 85 zontal partition, a partition intermediate the combustion-chamber and the fire-boxes, said partition having a passage thereover, an arch within the combustion-chamber having passages thereover and thereunder, a partition 90 in rear of the arch and having a passage thereover, means for conducting the products of combustion to one end of the boiler, and flues opening at opposite ends into the ash-pits and the fire-boxes, respectively. 95

In testimony whereof we affix our signatures in presence of two witnesses.

GEORGE E. EDGCOMB.
 BERT EDGCOMB.
 WM. D. ELLIS.

Witnesses:

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 LOUESE E. LACEY.