

(No Model.)

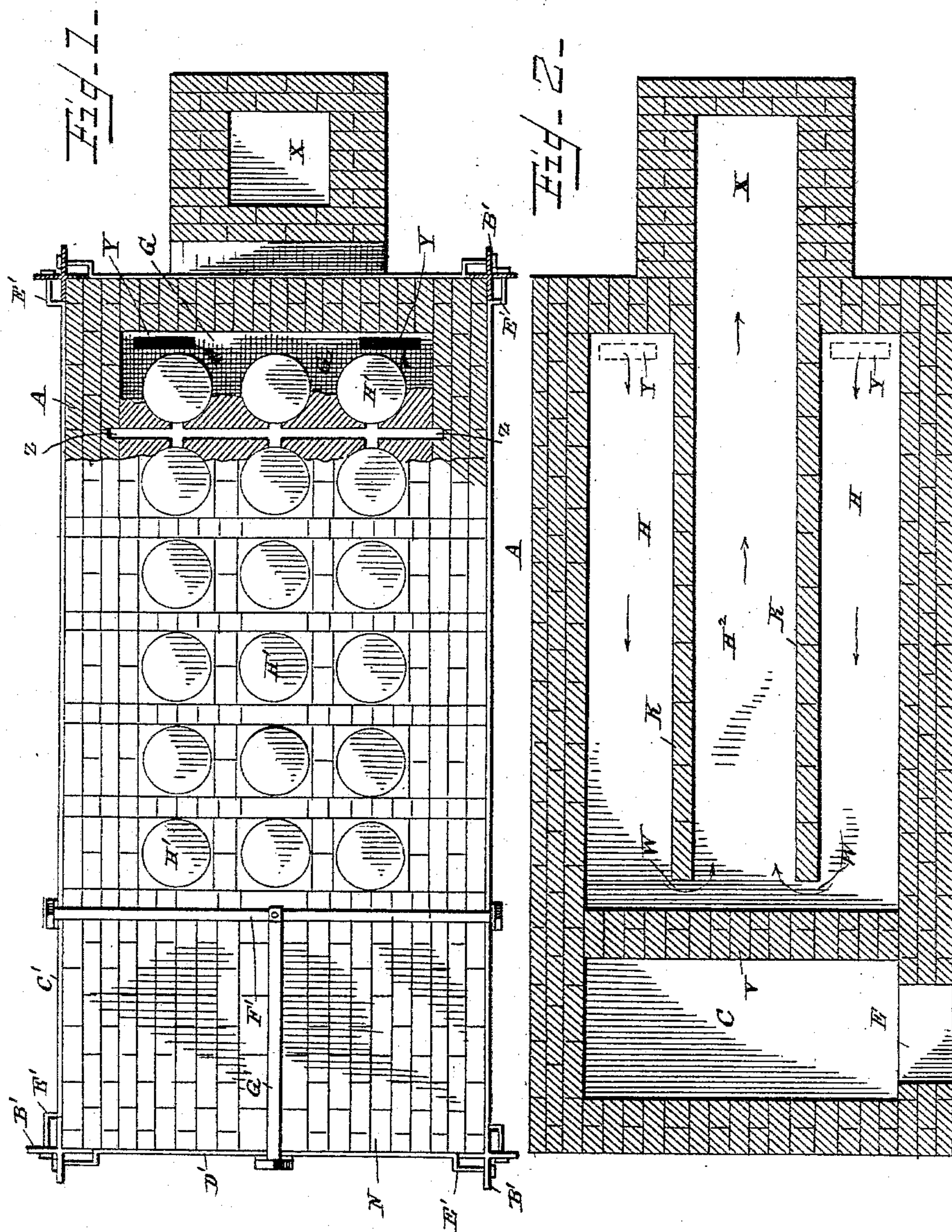
2 Sheets—Sheet 1.

J. BURNS.

# FURNACE FOR BAKING ELECTRIC LIGHT CARBONS.

No. 388,757.

Patented Aug. 28, 1888.



WITNESSES,

Edwin L. Yewell,  
Wm. J. Muntemann

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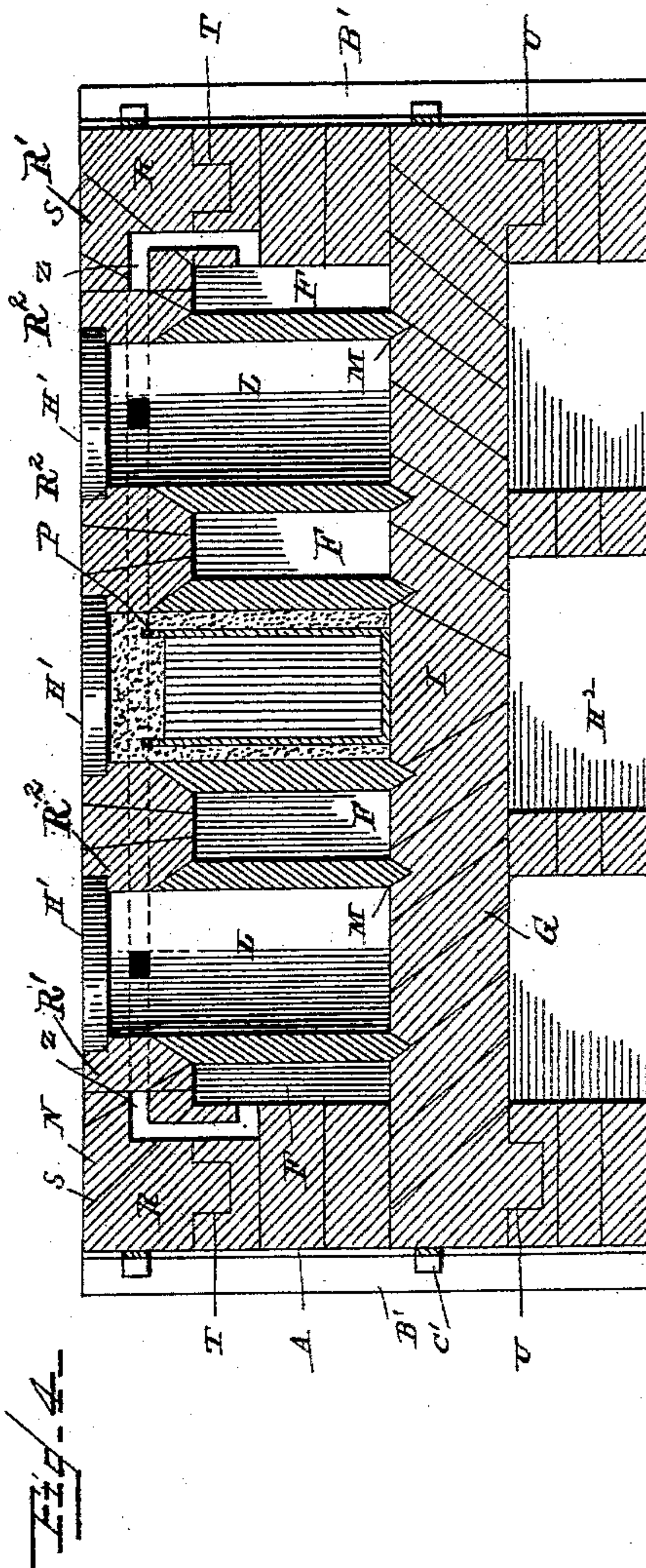
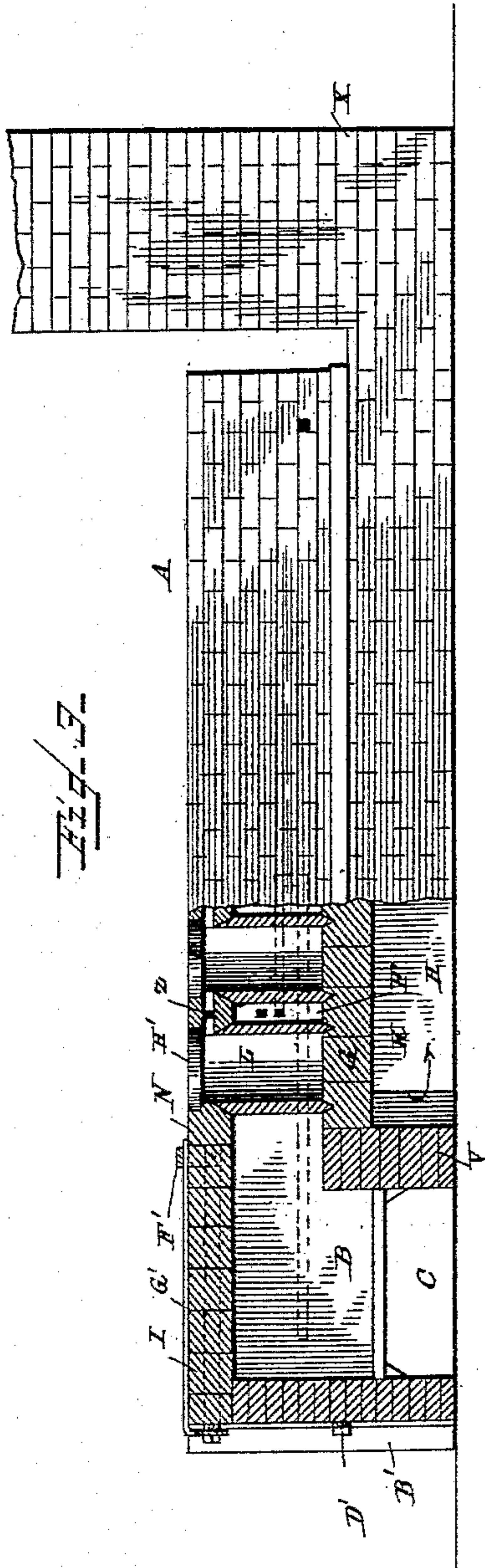


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# UNITED STATES PATENT OFFICE.

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## FURNACE FOR BAKING ELECTRIC-LIGHT CARBONS.

SPECIFICATION forming part of Letters Patent No. 388,757, dated August 28, 1888.

Application filed April 4, 1887. Serial No. 233,586. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN BURNS, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Furnaces for Baking and Annealing Various Articles, particularly designed for baking carbons employed in the production of electric-arc lights; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The principal objects of my invention are to so construct the furnace as to utilize all the heat of the fuel and burn the gases escaping from the carbon during the baking process in connection with the fuel, as more fully hereinafter specified. These objects I attain by the means illustrated in the accompanying drawings, in which—

Figure 1 represents a top view of my improved furnace with a portion broken away; Fig. 2, a horizontal section through the return-flues. Fig. 3 is a side elevation of the furnace with a portion broken away, and Fig. 4 a transverse vertical sectional view of the furnace.

Referring to the drawings, the letter A indicates the walls of the furnace, which are constructed of brick-work or masonry.

B indicates the fire-box of the furnace, and C the ash-pit thereof, which are located at the forward end of the same, and are provided with doors D E, for feeding the fuel and removing the ashes.

F indicates a combustion-chamber which extends from the fire-box to the rear of the furnace.

The letter G indicates a partition which forms the bottom of the combustion-chamber and the top of a series of return-flues, H. The said partition is constructed of tiles, the central ones, I, of which form a longitudinal key extending from end to end of the furnace, so as to support those at each side, which are obliquely laid, as plainly shown in Fig. 4 of the drawings. The flues are separated by the longitudinal partitions K, of brick-work or masonry. Within the combustion-chamber are

located a series of vertical cylindrical retorts, L, which are constructed of fire-clay or other refractory material. These have angular or beveled lower edges, which set in beveled or angular recesses M in the upper surface of the partition G or floor of the combustion-chamber, being cemented therein with any suitable refractory material. The upper ends of the retorts are beveled externally, so as to form key-seats for the bricks or masonry constituting the top N of the furnace, which is flat, for the purpose of manipulating the open-mouthed pots P, which are used in connection with the retorts for baking or annealing, as more fully hereinafter explained. The front and rear ends of the top of the furnace are formed of key-blocks R, of brick or other suitable material, having beveled faces S, which serve, in connection with the beveled upper ends of the retorts and the beveled blocks R' and R'', to hold the brick-work or masonry of the top of the furnace in position. The key-blocks are provided with tenons T, which set in recesses in the front and rear walls of the furnace, and the lower courses of the said walls are keyed together at U in a similar manner.

The letter V indicates a bridge-wall, which extends across the furnace between the ash-pit and the flues H, spaces W being left between said bridge-wall and the partitions K for the passage of the products of combustion through the central flue, H'', which connects at its rear end with the smoke-stack X. The flues H at their rear ends connect by means of apertures Y with the combustion-chamber above mentioned.

The letter Z indicates a series of passages extending transversely across the top of the furnace, through the masonry, and down the sides of the same. These communicate with the interior of the combustion-chamber at suitable points, and are connected with the upper parts of the retort by branch passages, so as to conduct the gas generated in heating the carbons into said combustion-chamber, where it is burned, thus effecting a large percentage of saving in fuel.

At the corners of the furnace are located angle-plates B', to which are secured the bands C' D', at the sides and front of the furnace.



These bands are of wrought-iron, and at their ends are offset, as indicated by the letter E', and bolted to the projecting wings of the angle-plates before mentioned. The bands C' connect with a band, F', extending across the top of the furnace, its end being bent downward at each side, so as to meet the said bands C'. The bands F' and D' are connected by a band, G', extending longitudinally along the top of the furnace down over the front, the connections of the respective bands being made by means of bolts or otherwise, as may be desired.

The retorts are provided with lids H' of refractory material, and each is adapted to contain a cylindrical pot or other vessel for the carbons or other article to be baked or annealed.

In operation the pots, suitably charged with the carbons or other articles, are placed in the retorts, and sand is filled in, so as to entirely fill the retorts, the pots, and the interstices between the carbons or articles. The fire being kindled in the fire-box, the products of combustion pass into the combustion-chamber around the retorts, heating the same intensely. After leaving the combustion chamber the said products of combustion pass out through the return-flues to the stack, so as to part with all or a greater portion of the heat before leaving the furnace, thus effecting a considerable saving of heat. The gases generated from the baking carbons enter the combustion-chamber at a point above the pots which contain the carbons, and are burned therein, thus effecting a further saving. By the use of the sand the spaces between the carbons are filled in, packing the same and supporting them during shrinkage, so that they cannot warp, thus insuring a perfect batch, which has not hitherto been effected, a large percentage being imperfect in the ordinary methods of baking.

To further economize fuel and intensify the heat, the walls of the furnace may be provided with flues leading from the open air to the ash-pit, so as to supply heated air to the fuel.

It will be observed that the strap or band F' extends longitudinally along the key-block at the top of the furnace, thus holding it in place and preventing the displacement of the masonry of the roof when tightening to take up shrinkage of the brick.

By means of the removable pots the carbons

may be removed in a body from any one of the retorts and replaced without disturbing the other retorts and interrupting the action of the furnace.

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

1. The combination, in a furnace, of a series of vertical retorts having beveled upper ends, with the key-blocks R and beveled blocks R' R<sup>2</sup>, and the bricks and masonry constituting the top, whereby the same is keyed and supported, substantially as set forth.

2. The combination, in a furnace, of the vertical retorts beveled at their lower ends and setting in annular beveled recesses in the floor of the combustion-chamber, substantially as specified.

3. The combination, in a furnace as described, of the vertical retorts beveled at their lower ends and setting in annular beveled recesses and beveled at their upper ends, substantially as and for the purposes set forth.

4. The combination, in a furnace, of the vertical retorts beveled at their ends and setting in annular grooved recesses and provided with covers and having communication with the combustion-chamber extending from the fire-box to the rear of the furnace, of the open-mouthed pots for holding the carbons, whereby the pots can be surrounded with sand at the sides and top, and likewise the interstices between the carbons in the pot be filled with the sand and the gases from the carbon escape from the open-mouthed pots into the combustion-chamber at a point above the pots, substantially as described.

5. The combination, in a furnace, of the vertical retorts beveled at top and bottom, the flat roof supported thereby, the gas-conducting pipes leading from the retorts to the combustion-chamber, and the return-flues leading to the smoke stack, and the bands, whereby the parts are bound together, the whole arranged to operate substantially in the manner specified.

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

JOHN BURNS.

Witnesses:

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