

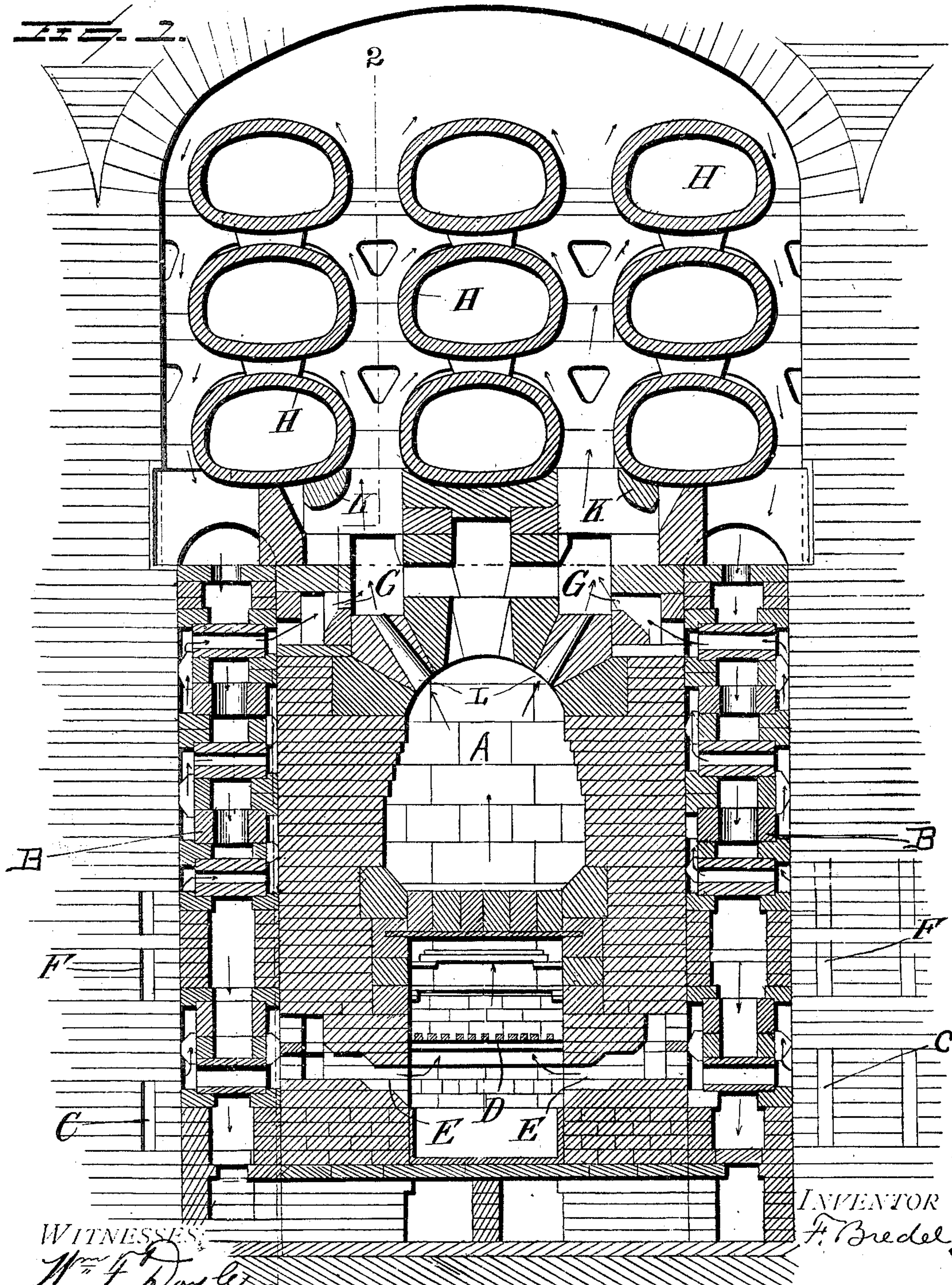
No. 704,504.

Patented July 15, 1902.

F. BREDEL.
RETORT GAS FURNACE.
(Application filed Mar. 20, 1901.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:
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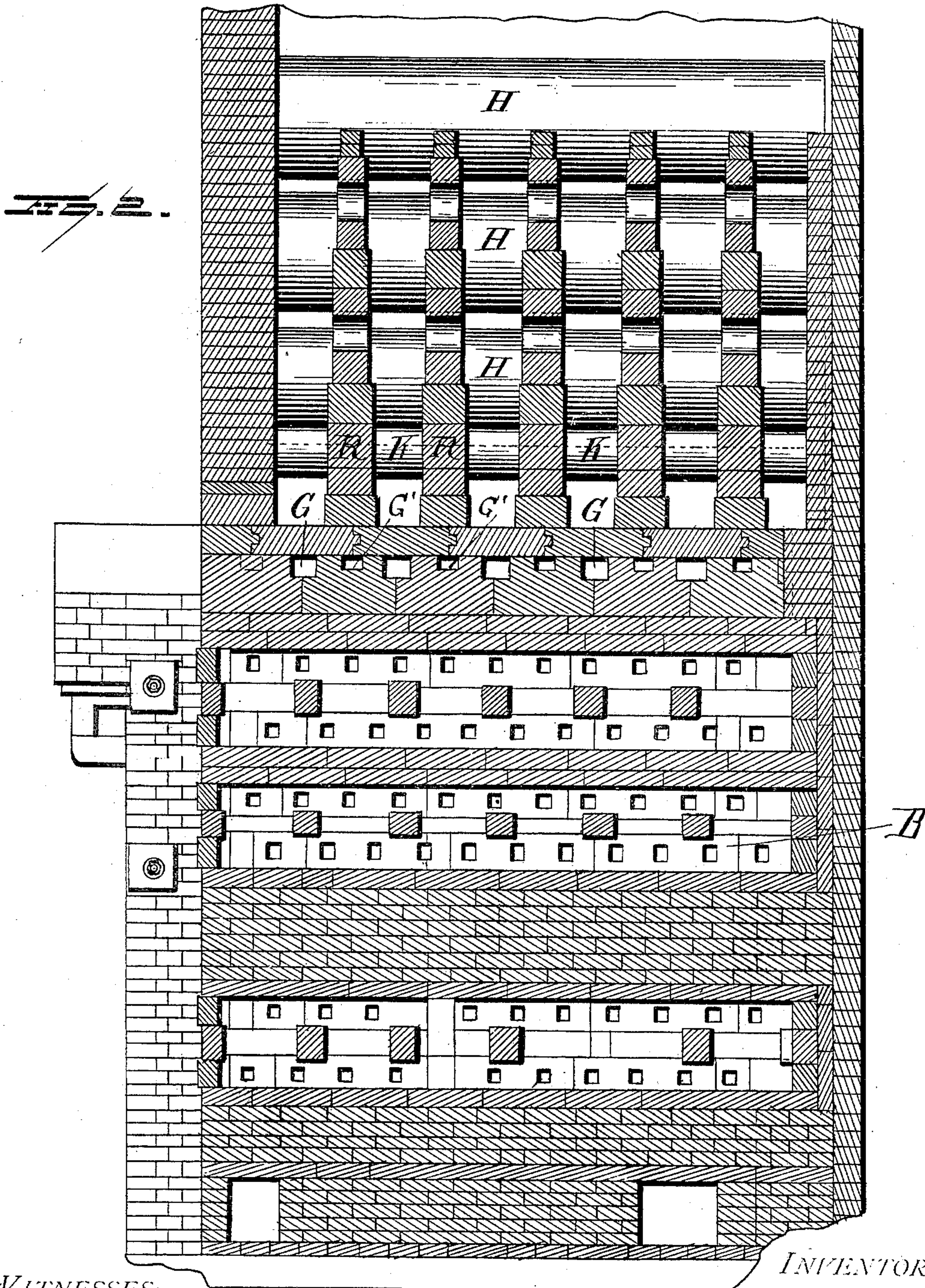
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UNITED STATES PATENT OFFICE.

FREDERICK BREDEL, OF MILWAUKEE, WISCONSIN.

RETORT GAS-FURNACE.

SPECIFICATION forming part of Letters Patent No. 704,504, dated July 15, 1902.

Application filed March 20, 1901. Serial No. 52,004. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK BREDEL, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Apparatus for Heating Retorts and Muffles; and I do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in recuperative furnaces and muffles, and in carrying out the present invention I improve upon the type of recuperator patented by August Kloenne, Patent No. 378,097.

In a retort-setting it has always been a difficult feature to get fire-clay material of a quality which would withstand the tremendous heat obtained in the combustion-chamber, and particularly where the furnace contains nine retorts, in which the lower center and lower side retorts give way. To overcome this difficulty, I have devised means for keeping the blocks under and supporting the lower retorts cool, and thereby obtaining a better distribution of heat.

My invention will be hereinafter more fully described and then specifically defined in the appended claim and is illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this application, and in which drawings similar letters of reference indicate like parts throughout both views, in which—

Figure 1 is a vertical cross-sectional view through my improved recuperator-furnace. Fig. 2 is a vertical sectional view taken on line 2 2 of Fig. 1.

Reference now being had to the details of the drawings by letter, A designates the fire-chamber or generator of the furnace, having an arched top through which are the nozzles or tapering passage-ways that lead to the combustion or retort chamber above. On either side of the fire-chamber is a series of recuperator-blocks having horizontal passage-ways in which the primary and secondary air-sup-

ply necessary for the combustion is preheated. As the detailed construction of each series of recuperator-blocks is covered by Patent No. 659,602, of October 9, 1900, a detailed description of this part of the furnace is not necessary. Suffice it to say that the lower series on either side of the furnace-chamber below the grate is for the purpose of supplying the primary current of air to the interior of the furnace below the grate for the purpose of primary combustion, while the upper series on either side take in air through the ducts F, and the air following the arrows shown in the drawings passes into the combustion-chamber above through ports G and G'. The position of ducts G is exactly opposite the generator gas nozzles or ducts L and supply the main amount of air necessary for combustion, while an auxiliary air-supply enters through G', located between G and G, and therefore also between L and L, and supplies the auxiliary or cooling air-supply.

Within the retort-chamber are arranged the retorts B, nine of which are shown in the drawings. These retorts are supported one above another by means of masonry columns, and on the under side of the outer two of the lowest retorts are the reinforcing and protecting blocks K, which are located above and adjacent to the outlet-ducts G. The secondary supply of air, which enters the retort-chamber through these ducts G, is for the purpose of combining directly with the generator-gas entering through ducts L and forming the combustion, and thereby heating the retort-chamber, while the air supplied through ducts G', called hereinafter the "auxiliary" air-supply, is for the purpose of keeping the blocks R cool, as the secondary supply of air entering the chamber through ducts directly under the blocks R is considerably cooler than the products of combustion and, not coming immediately into contact with the gas, has a tendency to act, as it were, like a cold-air blast on the blocks K, and uniting of this cool air can only take place in a higher zone after mixing with the other gases and will therefore locally retard the combustion. The zone of intense heat will be thereby laid somewhat higher than otherwise would be done and a better distribution of heat, besides the cooling of the blocks, will be obtained. The cir-

cuit of the secondary supply of air is shown by the arrows, in which on entering the air passes through the horizontal passage-ways in the recuperator-blocks and upon entering
5 the retort-chamber makes the combustion with the generator-gases and passes as products of combustion up and around the retorts, thence down, as indicated by the arrows, through the vertical passage-ways in
10 the recuperator-blocks, and then out through a passage-way (not shown) to a chimney.

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

15 In a recuperator-furnace, the fire-chamber or generator, the recuperator and the retort-

chamber and retorts mounted therein, protecting-blocks for the retorts nearest the fire-chamber, a primary supply of air-ducts leading into the space below the grate of the furnace, a secondary air-supply through ducts G to form combustion and an auxiliary air-supply through ducts G' situated below and close to supporting-blocks R for the purpose of keeping said blocks R cool, as set forth. 20 25

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

FREDERICK BREDEL.

Witnesses:

E. O. VOYER,
GEORGE H. KATZ.