

C. A. H. DE SAULLES.
ZINC RETORT FURNACE.
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1,041,977.

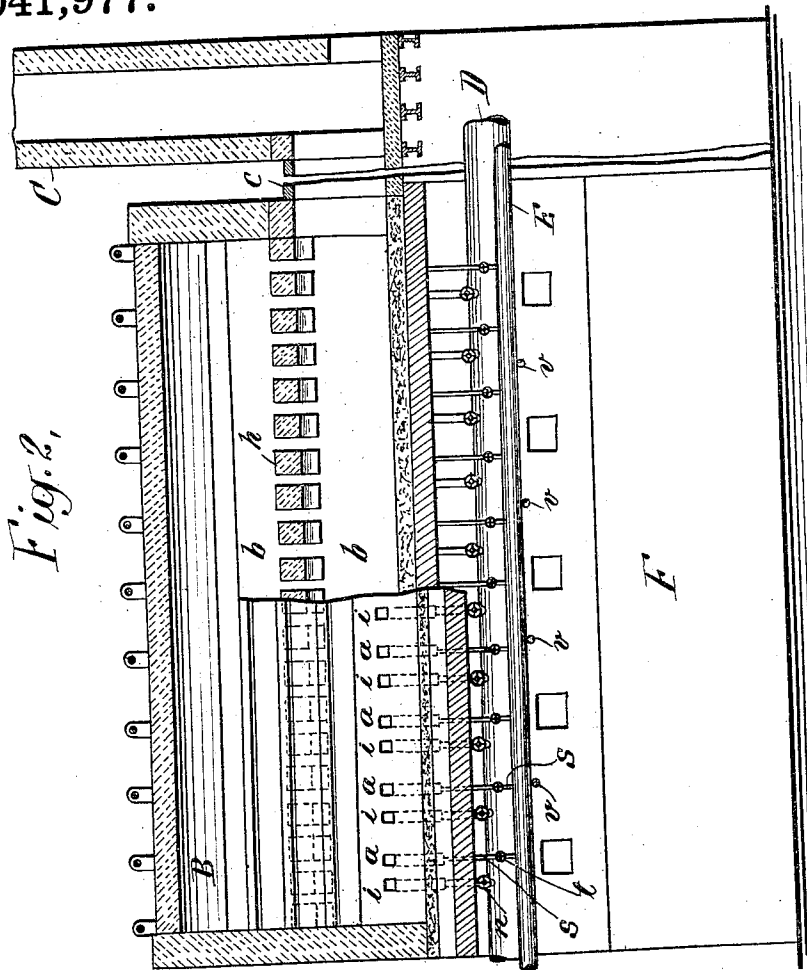


Fig. 2,

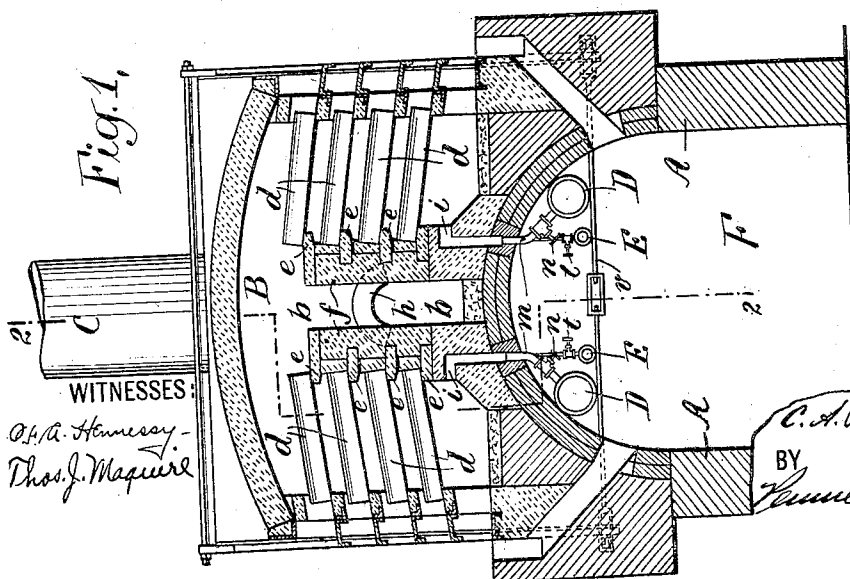


Fig. 1,

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UNITED STATES PATENT OFFICE.

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ZINC RETORT-FURNACE.

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Specification of Letters Patent.

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to all whom it may concern:

Be it known that I, CHARLES A. H. DE SAULLES, a citizen of the United States, residing in Gas, county of Allen, State of Kansas, have invented certain new and useful Improvements in Zinc Retort-Furnaces; 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.

My invention relates to zinc retort furnaces of that type wherein the exit flue for the products of combustion is located at one end of the furnace chamber, the retorts or muffles being supported, as usual, in an inclined position, in a number of rows one above the other, and being heated from below by the combustion of gaseous fuel admitted through a series of gas ports associated with a corresponding series of air supply ports.

In the furnace hereinafter described, the arrangement of the retorts or muffles is duplex, in the sense that the combustion chamber is practically divided into two compartments merging at the top in a central down-take, whose walls serve to support the shelves or ledges upon which rest the rear ends of the retorts. Each of these compartments is heated in the same way, that is to say, from gas and air ports disposed alternately in longitudinal series along the base of the ledge-supporting wall.

In a symmetrical arrangement of duplicate compartments of this character, whose products of combustion are conducted through a down-take common to both, to an exit flue located at the extreme end of the furnace, the draft of the chimney upon the gas and air ports varies progressively from one end of each compartment to the other, and to such a degree that there is a corresponding non-uniformity of temperature conditions in the combustion chamber, the portions more remote from the exit end for the waste gases being less efficiently heated. As a consequence, in order that the charges in the retorts may be finished or worked off within practically the same working time, some sacrifice in the amount of the charge must ordinarily be tolerated in the less efficiently heated retorts.

My invention is designed to avoid this difficulty, so as to permit the retorts, what-

ever be their location with respect to the exit-flue of the combustion chamber, to be equally heated, and therefore to be worked off, with the maximum charge for each, in practically the same time, thereby proportionately increasing the output of the furnace as a whole. To this end, I supply both the air and the gas to the furnace, under pressure, from suitable mains and provide the branch pipes, leading from the respective mains to the air and gas ports of the combustion chamber, with independent regulating valves. By appropriately adjusting these independent valves, according to the pressures prevailing in the mains and according to the draft of the chimney, I am thus enabled to realize with substantial accuracy equalized conditions of temperature throughout the entire length of both compartments of the combustion chamber,—a result which, so far as I am aware has not been heretofore accomplished in furnaces of this type.

In the accompanying drawing Figure 1 represents a cross-sectional view, partly in elevation, and partly broken away, of a zinc retort furnace embodying my improvements; Fig. 2 represents a longitudinal sectional view thereof taken in part on a central plane, and, in part, on a plane indicated by the irregular dotted line 2—2 of Fig. 1.

Similar letters of reference indicate similar parts throughout the several views.

Referring to the drawing, A indicates the supporting foundation for the retort chamber B, which, as shown, is divided into two compartments having a central longitudinal downtake *b*, which communicates at one end of the furnace with a suitable flue *c* leading to the chimney stack C. The retorts *d* for receiving the charge of zinc ore and reducing material are supported in the usual manner in an inclined position, and rest with their rear ends upon the ledges *e* which are supported by the vertical walls *f* of the downtake *b*, said walls being suitably buttressed by the arches *h*.

At the base of each of the compartments of the combustion chamber are located a series of air ports and a series of gas ports, which are preferably assembled in pairs and alternating with each other, the pairs being preferably spaced at substantially equal distances apart, so as to control the temperatures prevailing in the respective

zones of the furnace to which they severally belong. The air ports *i* communicate with an air pressure main D, through the instrumentality of a series of branch pipes *m*, each of which is provided with a regulating valve *n* for controlling the supply of air therethrough. So also, the gas ports *a* are connected to a gas pressure main E through the instrumentality of a series of branch pipes *s*, each of which is provided with a regulating valve *t* for controlling the amount of gas passed therethrough. The air pressure main D and the gas pressure main E for each compartment of the combustion chamber are conveniently located in the arched tunnel F and may be supported, as shown, upon the tie rods *v*, or otherwise.

The mode of operation of the furnace will be apparent.

By means of the regulating valves for the air and gas ports, the relative quantities of air and gas to obtain an equalized combustion throughout the length of both compartments of the combustion chamber may be accurately determined by the skilled operator, or may be varied from time to time as circumstances may require.

Having thus described my invention, what I claim is:—

1. A zinc retort furnace, provided with a combustion chamber having an exit flue for the products of combustion at one end there-

of, zinc retorts located within the chamber, a series of air ports and a series of gas ports opening into the combustion chamber below the retorts, an air pressure main and a gas pressure main communicating with the said air and gas ports respectively, and valves for controlling independently the air supply and the gas supply from the mains to each of the air and gas ports; substantially as described.

2. A zinc retort furnace, provided with a combustion chamber having two compartments with a central downtake, an exit flue for the products of combustion communicating with the downtake at one end of the chamber, zinc retorts located in the compartments, a series of air ports and a series of gas ports opening into each compartment below the zinc retorts, an air pressure main and a gas pressure main communicating with the air ports and gas ports respectively, and valves for controlling independently the air supply and the gas supply from the mains to each of the air and gas ports; substantially as described.

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

CHARLES A. H. DE SAULLES.

Witnesses:

A. D. TERRELL,
BLANCHE GOES.