No. 694,137. Patented Feb. 25, 1902.

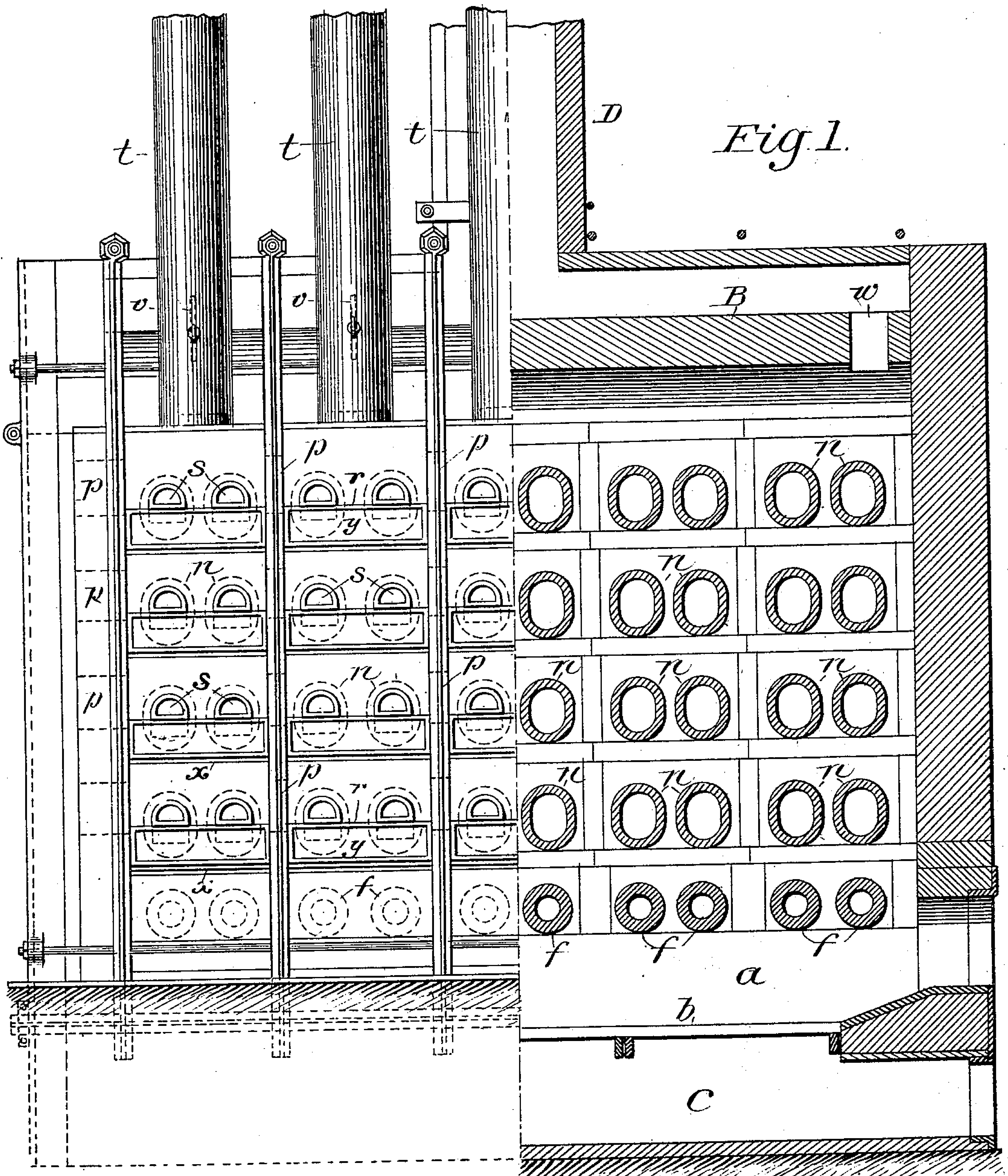
G. G. CONVERS & A. B. DE SAULLES.

ZINC FURNACE.

(Application filed Sept. 14, 1898.)

(No Model.) 2 Sheets—Sheet I.

Fig. 1.



Witnesses:

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E. M. Young.

Inventors.

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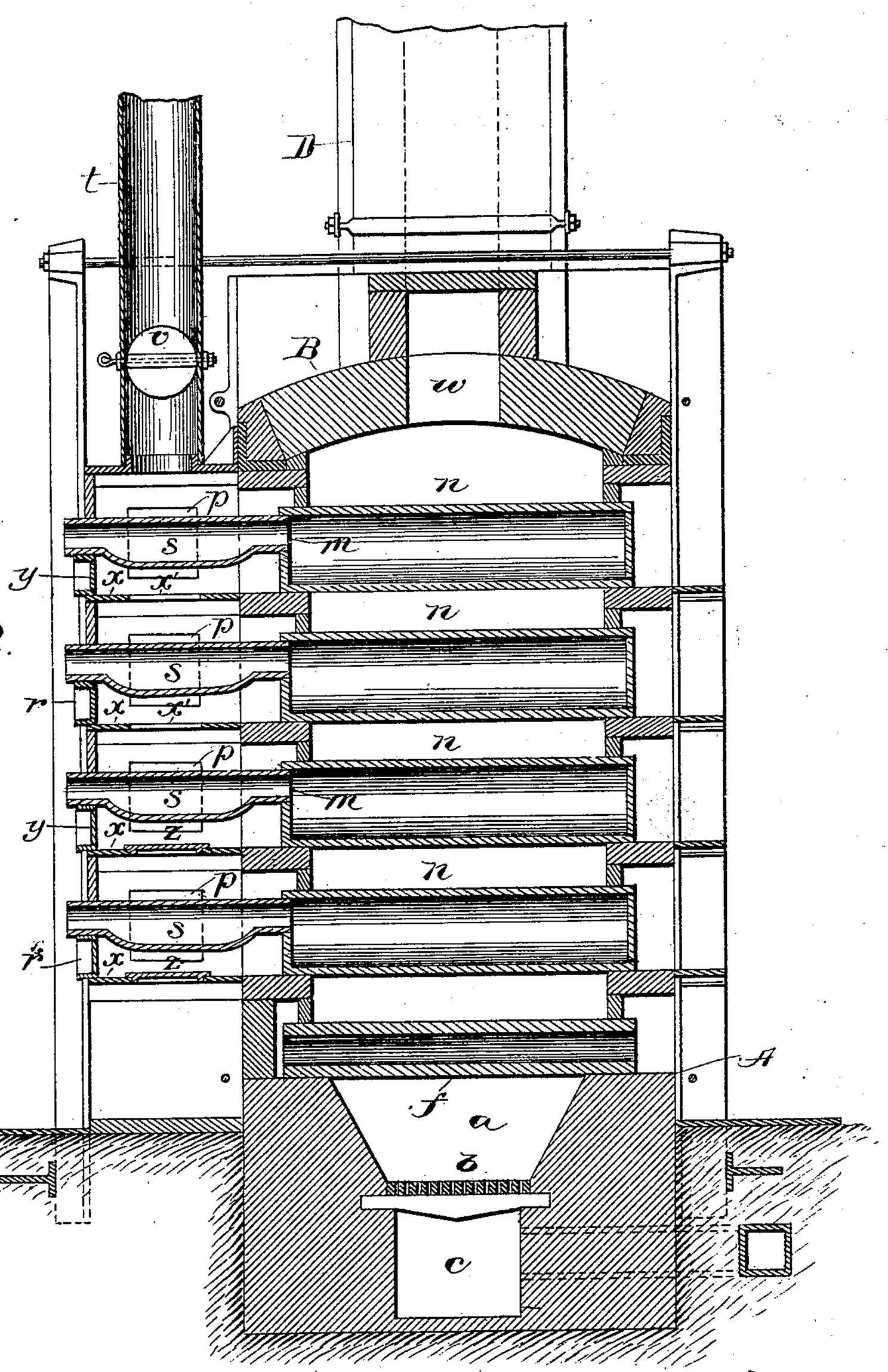

Fig. 2.

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UNITED STATES PATENT OFFICE.

GEORGE G. CONVERS AND ARTHUR B. DE SAULLES, OF SOUTH BETHLEHEM, PENNSYLVANIA.

ZINC-FURNACE.

SPECIFICATION forming part of Letters Patent No. 694,137, dated February 25, 1902.

Application filed September 14, 1898. Serial No. 690,912. (No model.)

To all whom it may concern:

Be it known that we, GEORGE G. CONVERS and ARTHUR B. DE SAULLES, citizens of the United States, residing in South Bethlehem, in the county of Northampton and State of Pennsylvania, have invented certain new and useful Improvements in Zinc-Furnaces; and we 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.

Our invention relates to certain new and useful improvements in zinc-furnaces, and is designed to furnish a construction permitting a retort or muffle to be cleaned and recharged independent of the other muffles, the cleaning and charging being done from the rear, obviating the removal of the condensers for that purpose and also facilitating the recovery of the metallic zinc by locating the condensers within a flue wherein a regulable cooling-draft may be constantly maintained during the zinc-distilling operation.

In the accompanying drawings, Figure 1 represents, partly in section and partly in elevation, a zinc-furnace embodying our improvements. Fig. 2 represents a vertical sectional view thereof.

Similar letters of reference indicate similar parts in both views.

Referring to the drawings, A indicates the basal portion of the furnace, *a* the fuel-chamber, *b* the grate-bars, and *c* the ash-pit thereof. Upon the side walls of the fuel-chamber rest the open-ended "cannon" *f*, whose function is to prevent the bottoms of the retorts being subjected to too high a temperature and to distribute the products of combustion about the retort side walls.

The retorts or muffles *n*, as shown, rest upon refractory tiles or bricks built up from the base A and extend transversely across the retort-chamber, within which the products of combustion circulate. The rear ends of the retorts are shown in Fig. 2 as luted up, and by reason of their location are readily accessible, so that the retorts may be conveniently cleaned and charged from the rear as soon as the charge in a retort or muffle is worked off and without removing the condensers. At their opposite ends the retorts receive the condensers *s*, which enter the vapor-exit openings *m* and serve to condense the zinc vapors into molten zinc. These condensers are located within cooling-flues, one of which in the form of apparatus shown is common to each double series of vertically-arranged retorts and each series horizontally. The purpose of the cooling-flues is to expedite the condensation of the fumes, and more particularly to regulate the condensing action. To this end each flue is provided at its top with a draft-regulating stack *t*, having a damper *v*, whose adjustment determines the strength of the draft through the flue and openings *p*, whereby it may be increased or diminished, as desired, to accord with the conditions prevailing at any particular time.

Transversely of the cooling-flue extend the dividing-partitions *x*, each having an opening *x'*, adapted to be covered when desired by a lid *z*, so that, for instance, if it is desired to admit the entering air directly beneath an upper condenser or condensers without first passing over the hot surfaces of the lower ones in the series the lower lids may be adjusted in place over the corresponding lower openings *x'* and the incoming air will be admitted through the front wall of the cooling-flue at the desired higher level. In the same manner the openings *p* allow a horizontal cooling effect on any or all the condensers, regulating the same by opening or closing the space *p* by a brick tile. It will be understood that the brickwork around the exit-openings of the condensers is of a loose character, and although luted up in the usual manner may readily be broken into to provide the draft-openings referred to and also to permit the necessary access to the lids or covers *z*. Thus there are provided immediately below the condensers the metal frames *r*, containing the brickwork *y*, which brickwork may be removed in whole or in part for the purpose stated.

Having thus described our invention, what we claim is—

1. A zinc-furnace, provided with a retort-chamber for the circulation of products of combustion, a plurality of retorts or muffles arranged in vertical series within said cham-

ber, a cooling-flue chamber common to all of said retorts and adjacent to the vapor-discharge openings of the retorts, zinc-condensers extending through the cooling-flue chamber, and means for creating a cooling-draft through said flue-chamber; substantially as described.

2. A zinc-furnace, provided with a retort-chamber for the circulation of products of combustion, a plurality of retorts or muffles arranged in vertical series within said chamber, a cooling-flue chamber common to all of said retorts and adjacent to the vapor-discharge openings of the retorts, zinc-condensers extending through the cooling-flue chamber, means for creating a cooling-draft through said flue-chamber, and means for regulating the cooling-draft; substantially as described.

3. A zinc-furnace, provided with a retort-chamber for the circulation of products of combustion, a plurality of retorts or muffles arranged in vertical series within said chamber, a cooling-flue chamber common to all of said retorts and adjacent to the vapor-discharge openings of the retorts, zinc-condensers extending through the cooling-flue, and valved transverse partitions within the flue and between the several condensers; substantially as described.

4. A zinc-furnace, provided with a retort-chamber for the circulation of products of combustion, a plurality of retorts or muffles arranged in vertical series within said chamber, a cooling-flue chamber common to all of said retorts and adjacent to the vapor-discharge openings of the retorts, zinc-condensers extending through the cooling-flue, valved transverse partitions within the flue and between the several condensers, and a valved stack surmounting the flue-chamber; substantially as described.

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

GEORGE G. CONVERS.
ARTHUR B. DE SAULLES.

Witnesses:
OSWIN WEINBERGER THELLY,
EDWARD J. MALLOY.