

No. 615,709.

Patented Dec. 13, 1898.

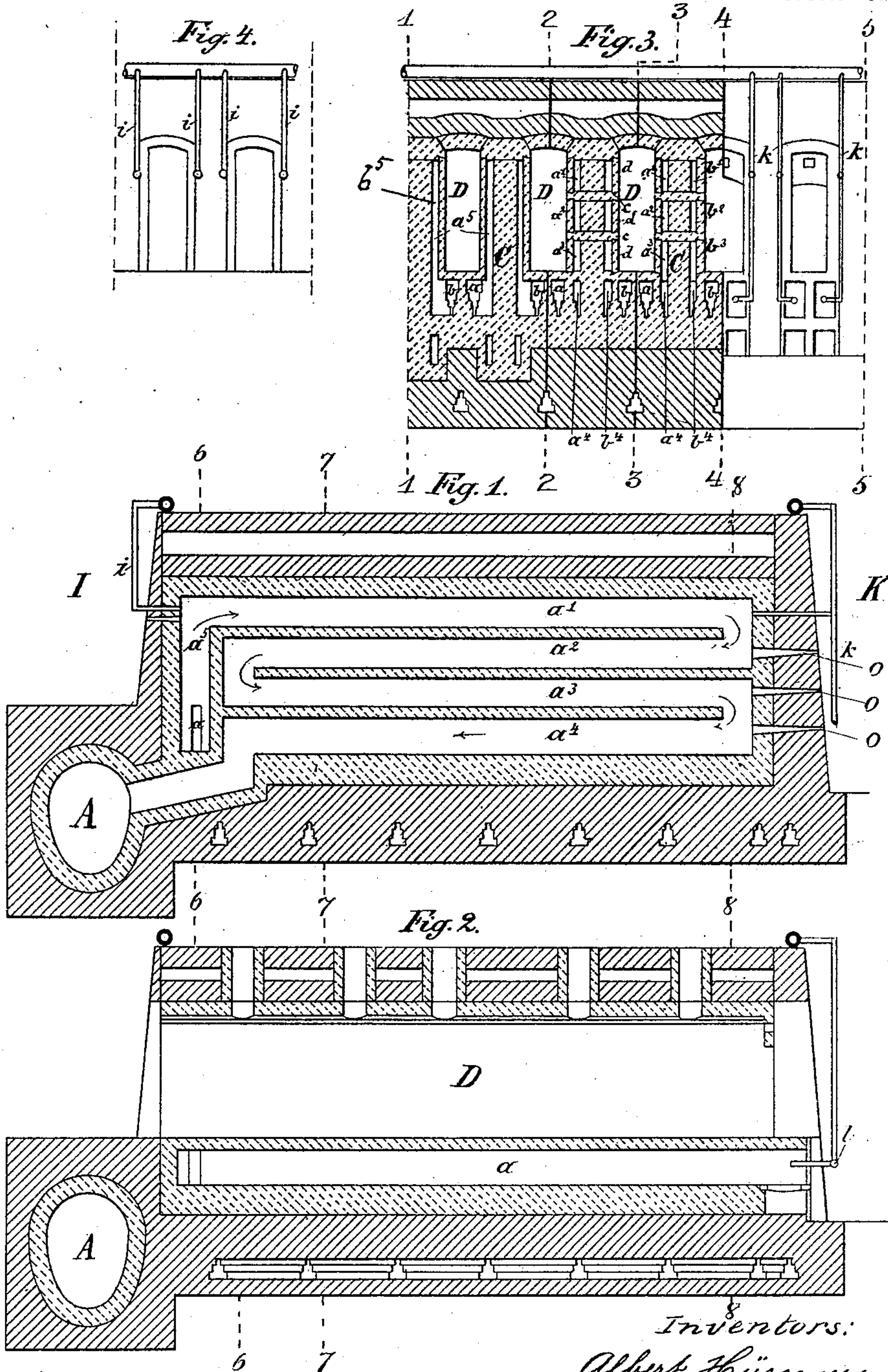
A. HÜSSENER, L. HOLBECK & J. KIRSCHFINK.

HORIZONTAL COKE OVEN.

(Application filed Mar. 30, 1896.)

(No Model.)

6 Sheets—Sheet 1.



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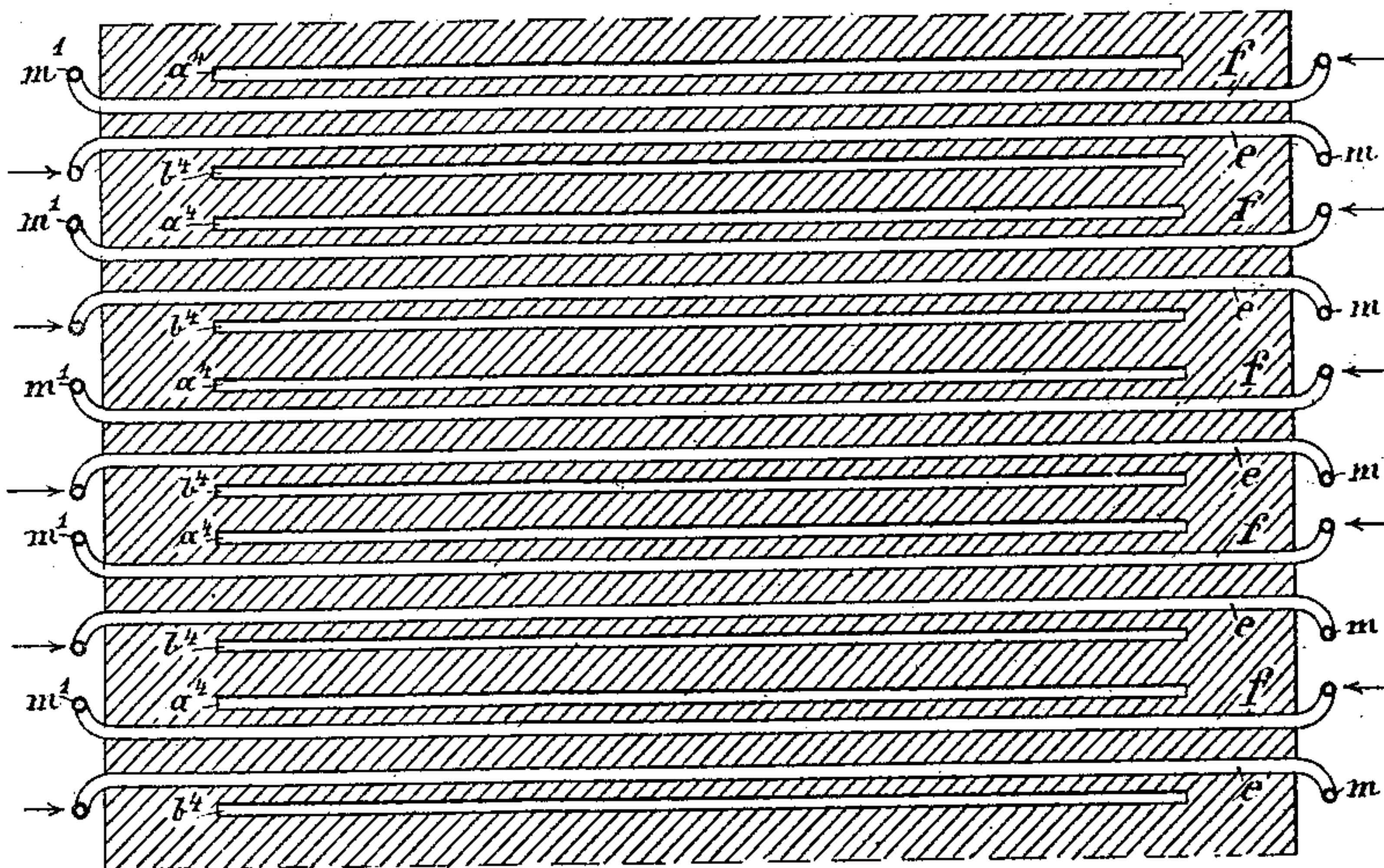
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(No Model.)

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Fig. 12.



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Fig. 13.

Fig. 14.

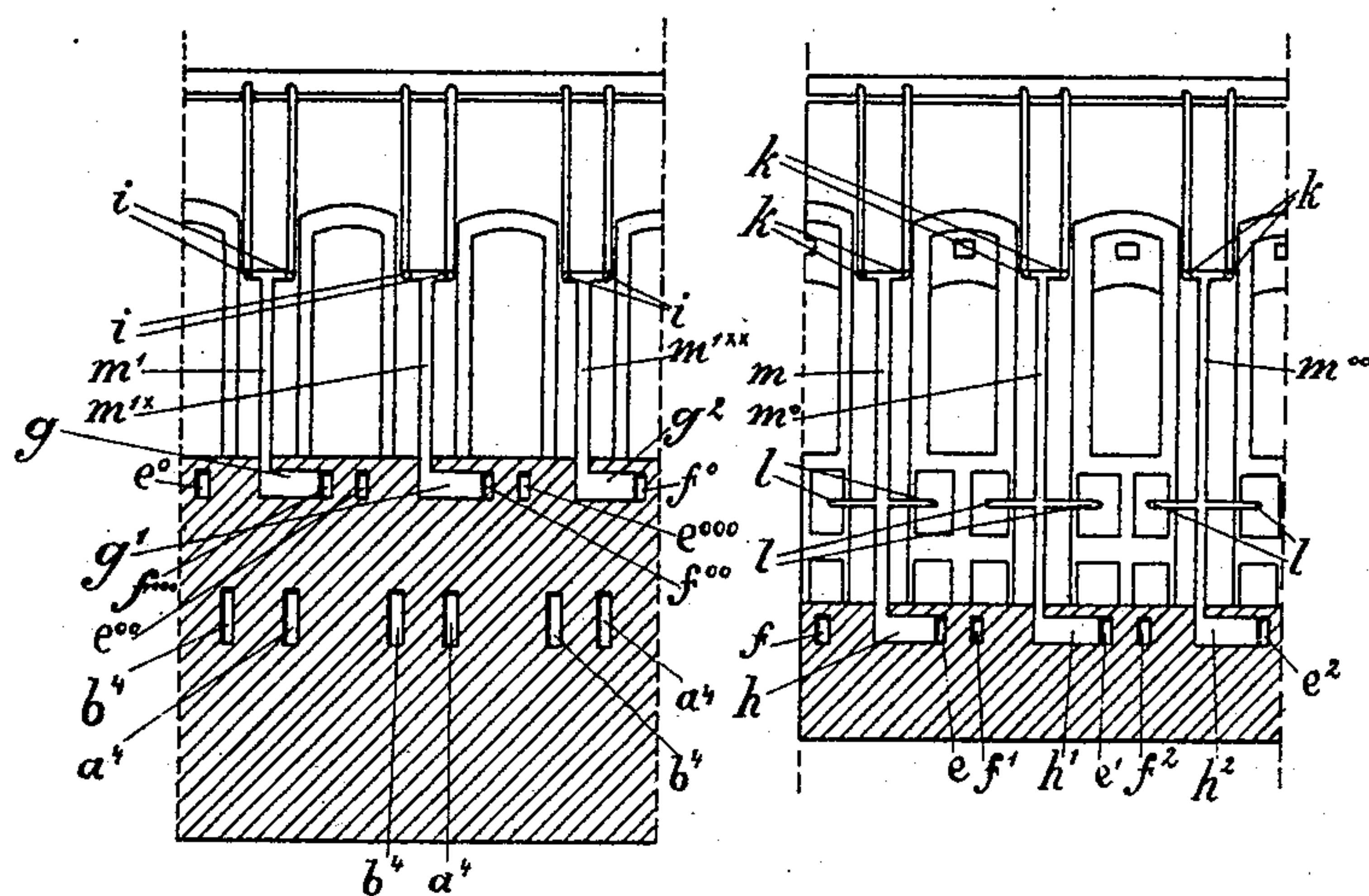
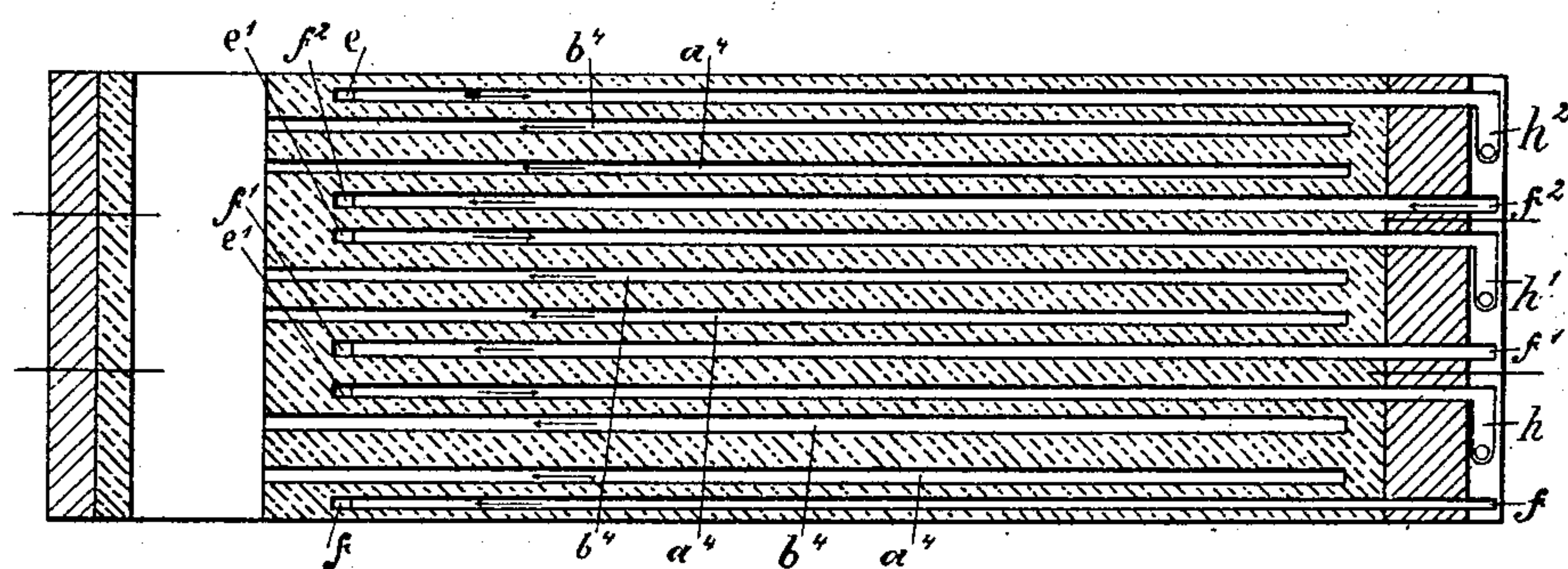

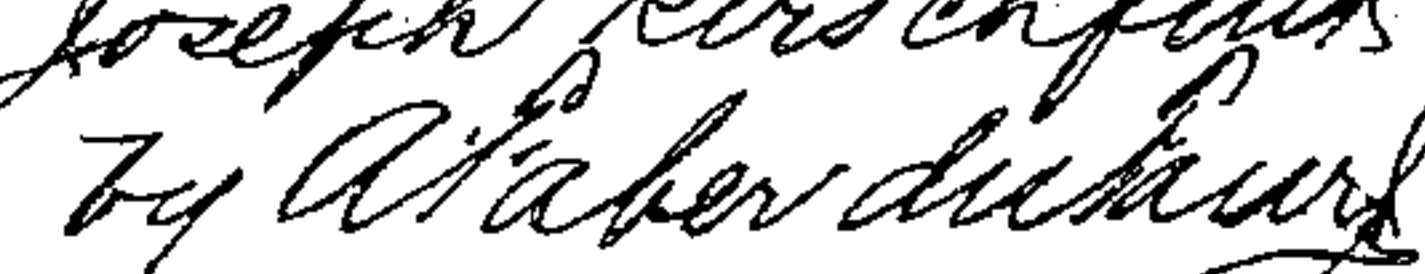


Fig. 16.



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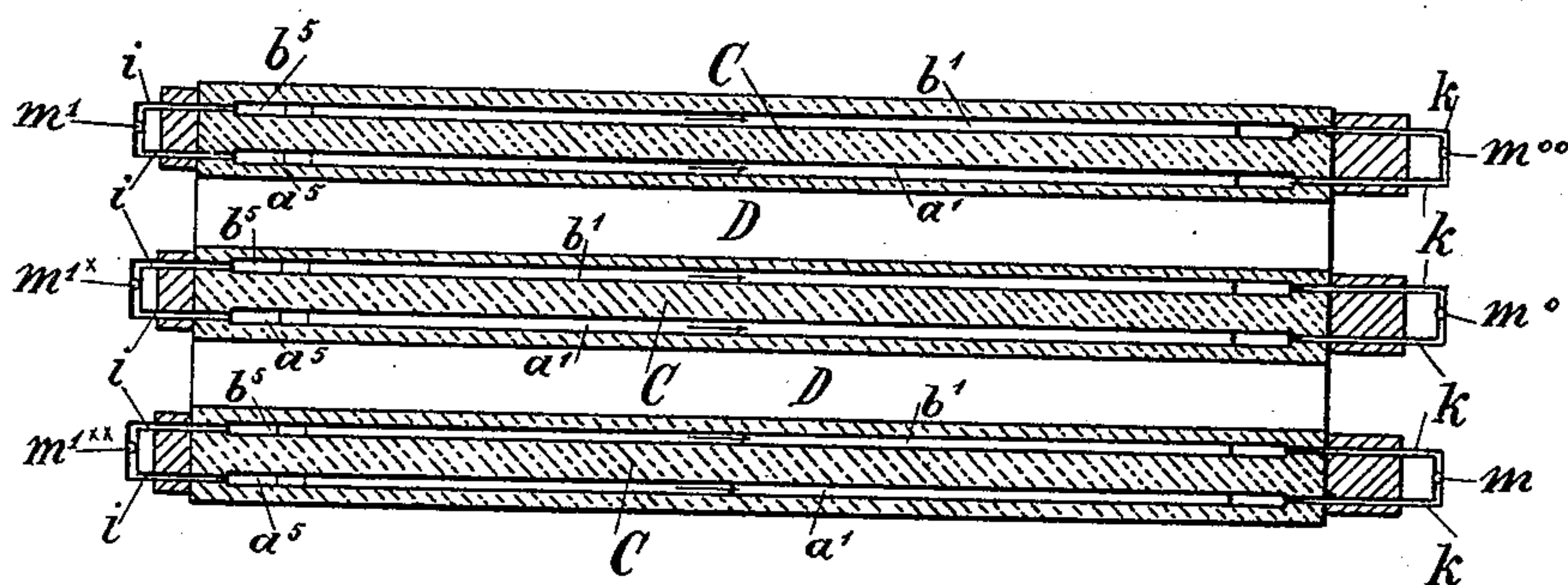
## HORIZONTAL COKE OVEN.

(Application filed Mar. 30, 1896.)

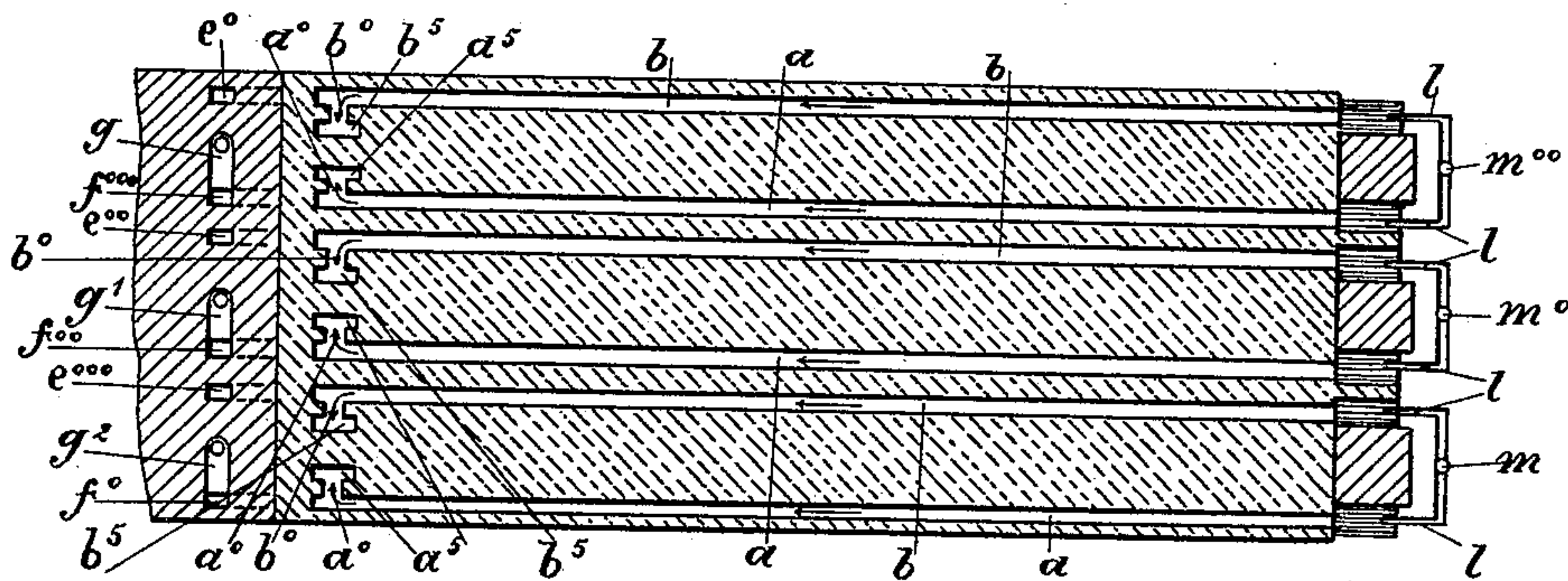
(No Model.)

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*Fig. 15.*



*Fig. 17.*



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Inventors:

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24. Abänderung d. Statut.

Atty.



# UNITED STATES PATENT OFFICE.

ALBERT HÜSSENER, OF ESSEN-ON-THE-RUHR, AND LOUIS HOLBECK AND JOSEPH KIRSCHFINK, OF UECHENDORF, GERMANY, ASSIGNORS TO SAID HÜSSENER.

## HORIZONTAL COKE-OVEN.

SPECIFICATION forming part of Letters Patent No. 615,709, dated December 13, 1898.

Application filed March 30, 1896 Serial No. 585,341. (No model.)

*To all whom it may concern:*

Be it known that we, ALBERT HÜSSENER, residing at Essen-on-the-Ruhr, and LOUIS HOLBECK and JOSEPH KIRSCHFINK, residing at Uechendorf, near Gelsenkirchen, Prussia, Germany, subjects of the King of Prussia, German Emperor, have invented new and useful Improvements in Horizontal Coke-Ovens, of which the following is a specification.

10 The present invention relates to that class of coke-ovens having horizontal flue systems in which the gases generated in the coking-chambers are burned with the air fed to the system.

15 The invention consists, essentially, in the peculiar arrangement of the flues, by means of which each side of each coking-chamber is provided with a separate flue system, so that one or the other side of either of the said chambers may be more or less intensely heated at the will of the operator and entirely independently of the other chambers.

25 The nature of our invention will best be understood when described in connection with the accompanying drawings, in which—

Figures 1 and 2 are vertical sections through the flues and through the coking-chambers, respectively. Fig. 3 is a broken vertical section of Figs. 1 and 2, the part between lines 1 1 and 2 2 being taken on lines 6 6 of Figs. 1 and 2, the part between lines 2 2 and 3 3 on lines 7 7, the part between lines 3 3 and 4 4 on lines 8 8, and the part between lines 4 4 and 5 5 showing an end view from the right side of Figs. 1 and 2. Fig. 4 is an end view of one oven seen from the left of Figs. 1 and 2. Fig. 5 is a detail transverse section, drawn on a larger scale, of the partition-walls between the coking-chambers, showing the manner of constructing the lateral flue systems. Fig. 6 is a similar section showing a modified form of construction for the same. Fig. 7 is a similar section showing another modification. Figs. 8 and 9 are vertical sections through the flues and through the coking-chambers, respectively, of a modified form of oven. Fig. 10 is a broken vertical section of Figs. 8 and 9. Fig. 11 is an end view of one oven seen from the left of Figs. 8 and 9. Fig.

12 is a horizontal section showing the air-heating arrangement of Fig. 8, the section being taken on the line I K, Fig. 8. Fig. 13 is a cross-section on the line 13 13, Figs. 8 and 9. Fig. 14 is a cross-section on the line 14 14, Figs. 8 and 9. Fig. 15 is a horizontal section on the line 15 15, Fig. 8. Fig. 16 is a horizontal section on the line 16 16, Figs. 8, 9, and 10. Fig. 17 is a similar section on the line 17 17, Figs. 8 and 9.

Similar letters of reference designate corresponding parts throughout the several views of the drawings.

According to the present invention and in contradistinction to the systems hitherto employed two flues *a* and *b* are formed beneath the sole of the coking-oven D, said flues being entirely separated one from another by means of a partition-wall. Each flue communicates by means of a passage *a*<sup>0</sup> and *b*<sup>0</sup> with its corresponding uptake *a*<sup>5</sup> and *b*<sup>5</sup>, the upper ends of which open into the horizontal zigzag flue systems *a*<sup>1</sup> *a*<sup>2</sup> *a*<sup>3</sup> *a*<sup>4</sup> and *b*<sup>1</sup> *b*<sup>2</sup> *b*<sup>3</sup> *b*<sup>4</sup>, respectively. The lowest flues *a*<sup>4</sup> and *b*<sup>4</sup> of each system communicate by means of a short canal with the waste-flue A for carrying off the waste products of combustion from all the coking-chambers D. The gases from the coking-chambers are conducted into the flue systems by means of the pipes *i* or *k* in the well-known manner, air being allowed to enter the flues in suitable quantities by any well-known means, such as jet-openings, as shown.

From the above description it will be evident that each side of each coking-chamber will be heated by a separate flue system and that each flue system may be regulated quite independently at the will of the operator, so that one or the other side of any one flue may be more or less intensely heated, according to requirement.

We are aware that subsole-flues have been employed prior to the present invention, but no arrangement has hitherto been devised, as far as our knowledge goes, of a duplicate subsole-flue system having each member communicating separately with one laterally-arranged flue system.



As shown in Figs. 5 to 7, the partition-walls between the coking-chambers are constructed to receive the whole weight of the chamber-roof, the slabs  $d\ d$  and the horizontal slabs  $c\ c$ , forming the lateral flue systems, being dovetailed together, as shown in Fig. 5 and in two modified forms in Figs. 6 and 7. All strain due to the weight of the roof or vault of the chamber is thus taken off the thin slabs  $d\ d$ , which may consequently be very light. The arrangement shown enables the slabs  $d\ d$  to be easily and conveniently taken out and exchanged without interfering with the bond of the masonry of the partition-walls.

The oven above described is intended for working with ordinary cold-air feed; but in Figs 8 to 12 we have illustrated a construction of the oven showing auxiliary flues for previously heating the air fed to the flue systems. In this case the lowest arm of each horizontal flue system  $a^4\ b^4$  is arranged at a lower level, lying underneath the level of the subsole-flues  $a$  and  $b$ , and between the said flue-arms  $a^4$  and  $b^4$  are formed auxiliary flues  $e$  and  $f$ , through which the cold air is conducted prior to its being fed to the lateral flue systems for combustion. As shown in Fig. 12, the air-channels  $e$  and  $f$  extend from one side of the oven to the other and supply hot air to main pipes  $g$  and  $h$  on opposite sides of the ovens, from which main pipes it is supplied to the heating-flues by the pipe systems  $m$ . The pipes or flues  $e$  and  $f$  alternate, the pipe  $e$  taking the cold air from one side of the oven and supplying it as hot air to the pipe system  $m$  at the opposite side and the pipe  $f$  taking cold air from the opposite side and supplying it as hot air to the side of the oven at which the pipe  $e$  takes its cold air.

What we claim as new is—

1. In a horizontal coke-oven for recovering the by-products, the combination with the partition-walls between the coking-chambers and a separate system of zigzag flues at either side of each of said chambers, of a separate and independent subsole-flue for each of said flue systems, whereby the flue system on one side of said chambers is heated and controlled independently of the system on the opposite

side, substantially as and for the purpose described.

2. In a horizontal coke-oven for the recovery of the by-products, the combination with the partition-walls between the coking-chambers and a separate system of horizontal zigzag flues at either side of each of said chambers, of a separate and independent subsole-flue for each of said flue systems, whereby the flue system on one side of said chambers is heated and controlled independently of the system on the other side thereof, and a series of auxiliary air-channels passing through the said coke-oven, and each having one end open for the reception of the cold air, and a pipe system communicating with the other end for feeding the air to the flue system, substantially as described.

3. In horizontal coke-ovens for recovering by-products having partition-walls between the coking-chambers and a separate system of zigzag flues at either side of each of the said chambers, the combination of a duplex subsole-flue having each of its members separately and independently communicating with one of the said lateral flue systems, each of these members being connected to one uptake of each side-wall flue system and of a series of auxiliary air-channels lying between the lowest waste-heat flues in the lowest part of the foundation of the oven, extending with both ends through the front walls of the ovens—one end of these channels leading to the open air for the reception of cold air and the other end communicating with the pipes for leading the heated air to the gas-supply—entering the heating-flues for the purpose of combustion therewith, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

ALBERT HÜSSENER.  
LOUIS HOLBECK.  
JOSEPH KIRSCHFINK.

Witnesses:

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