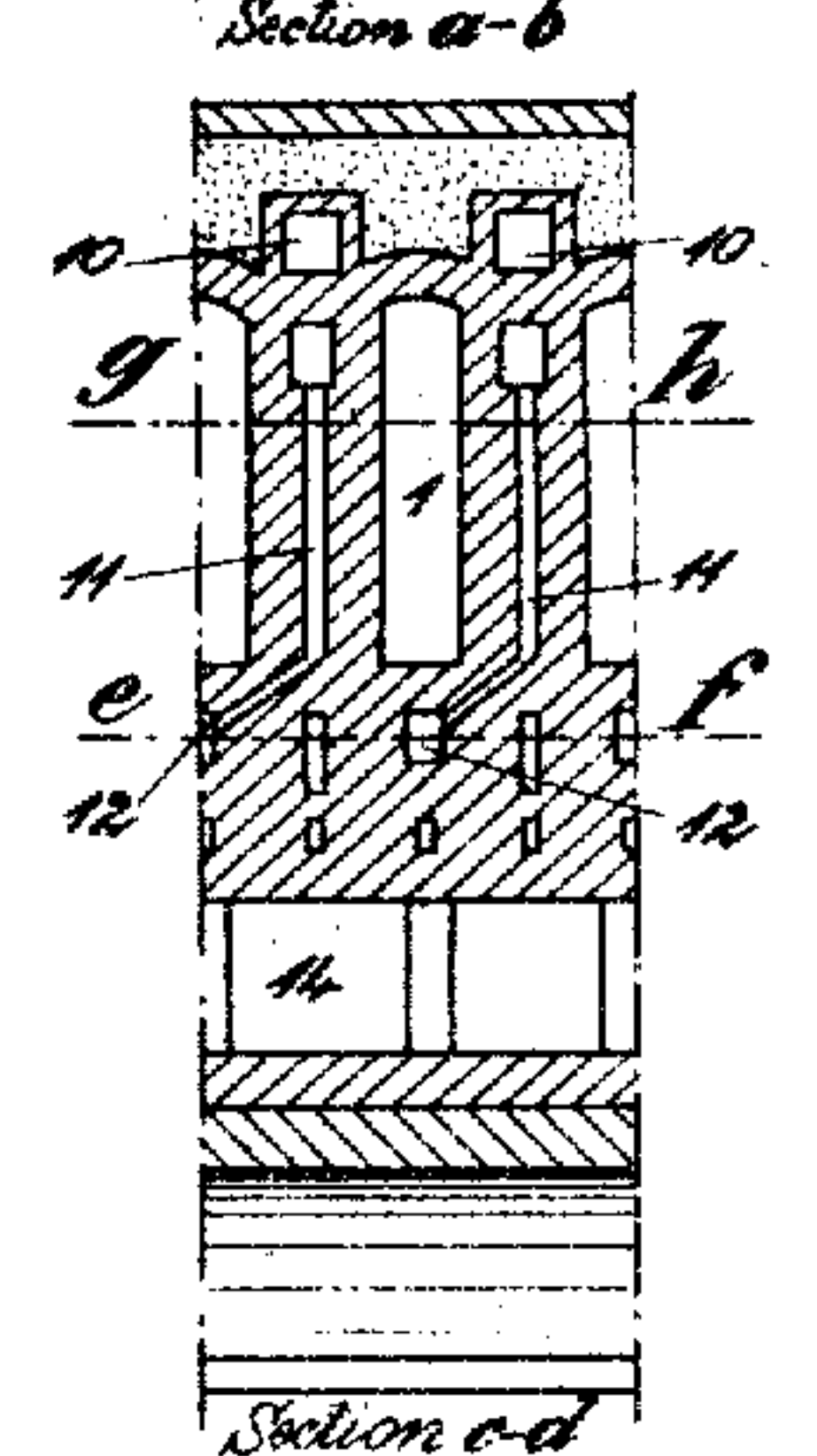
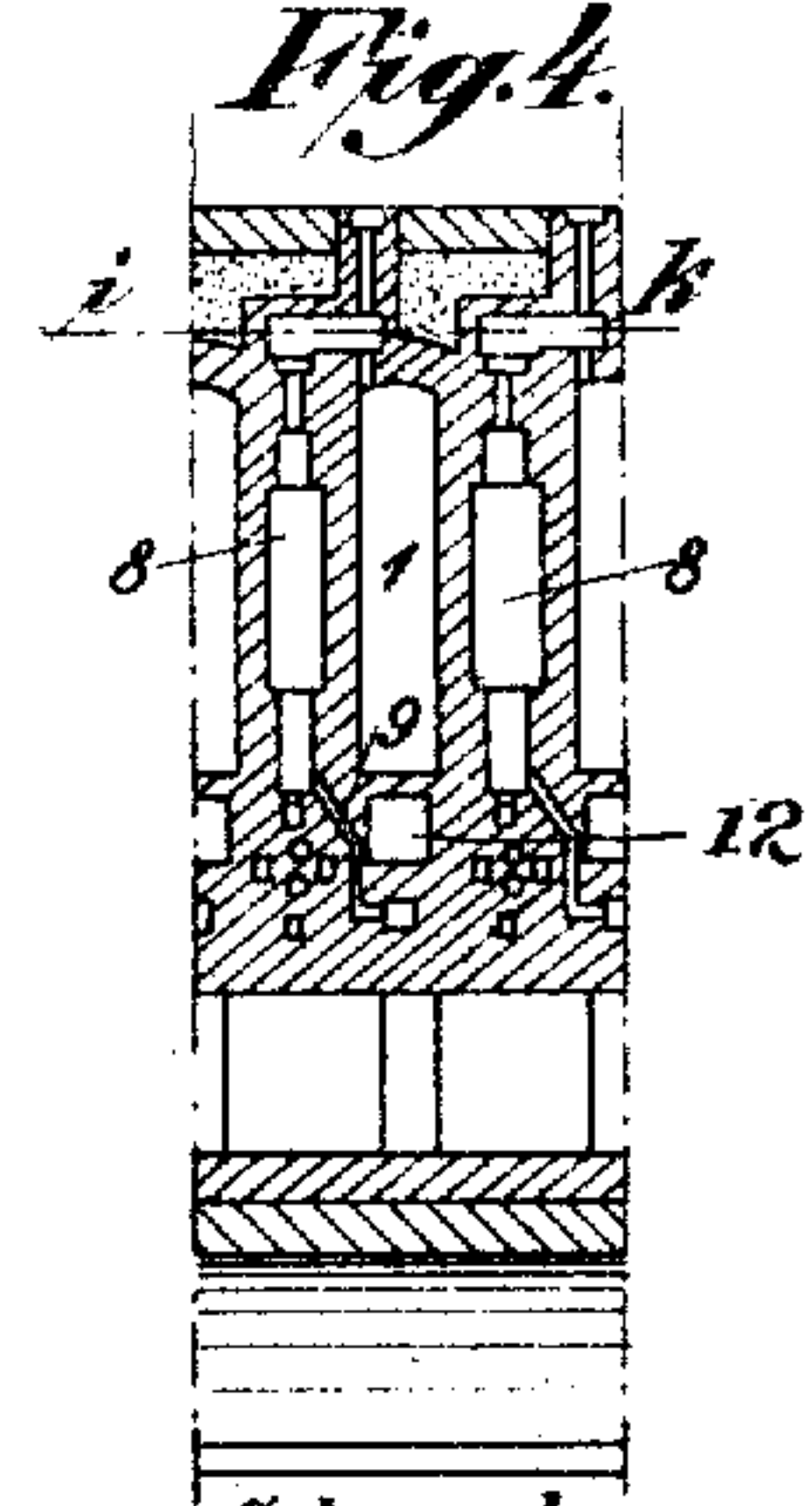
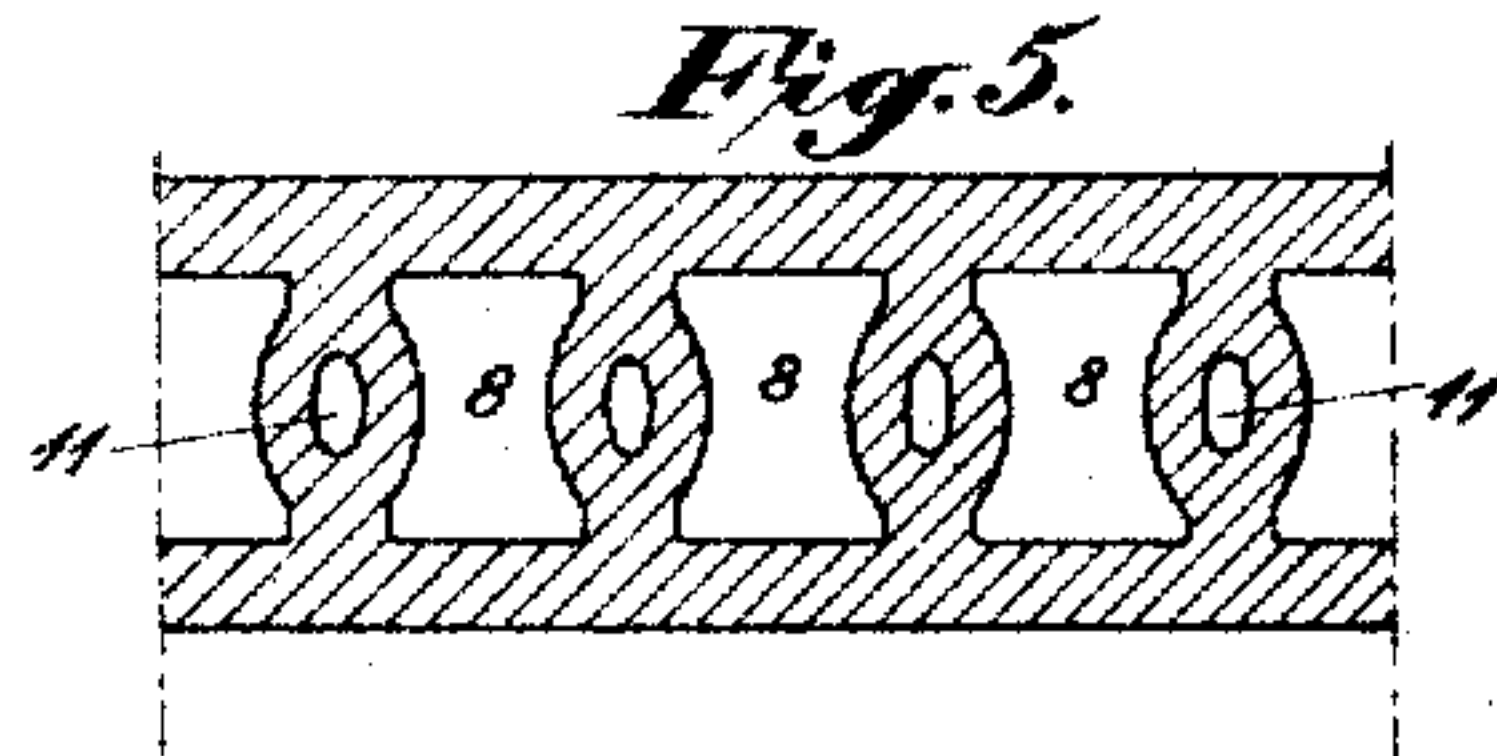
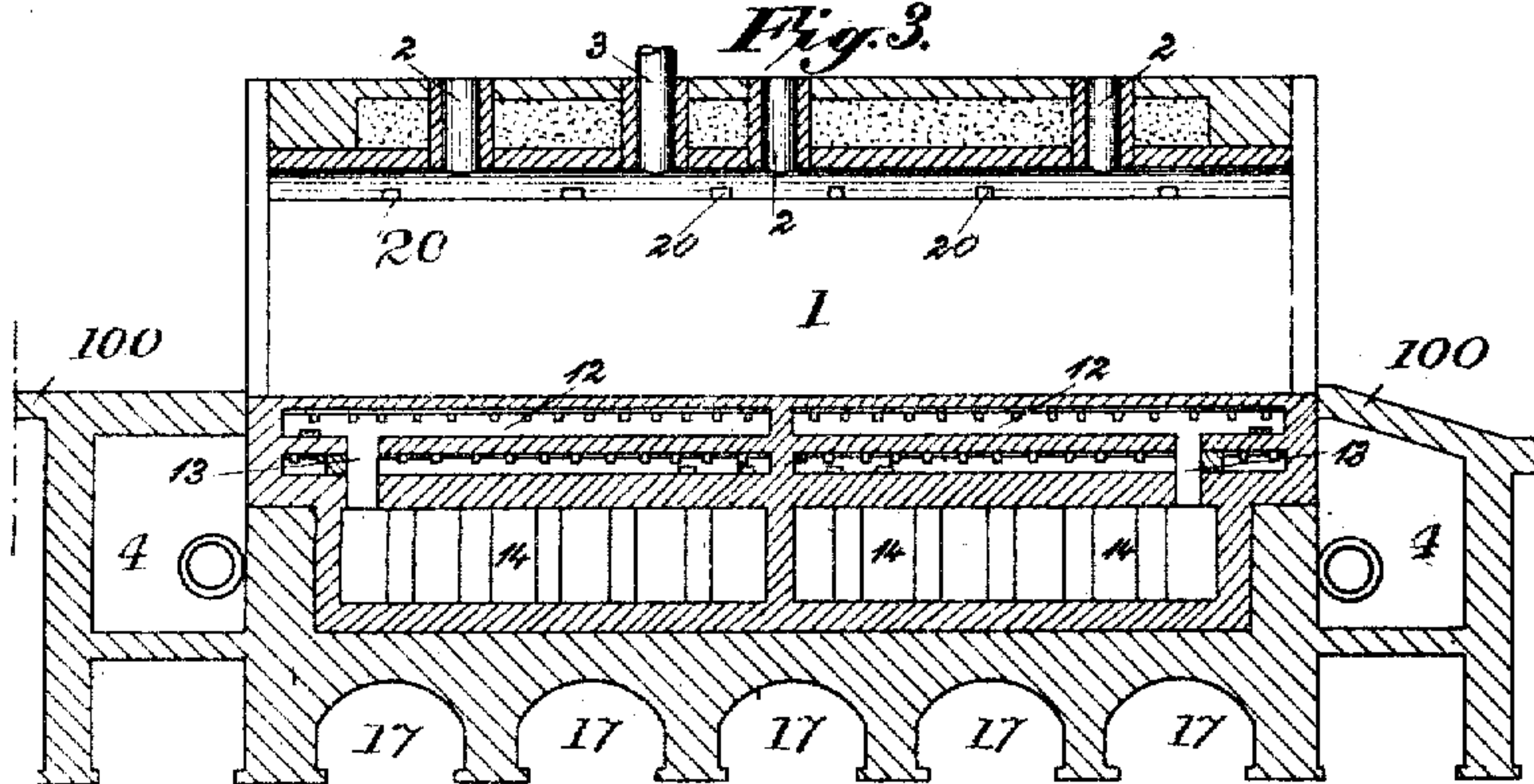
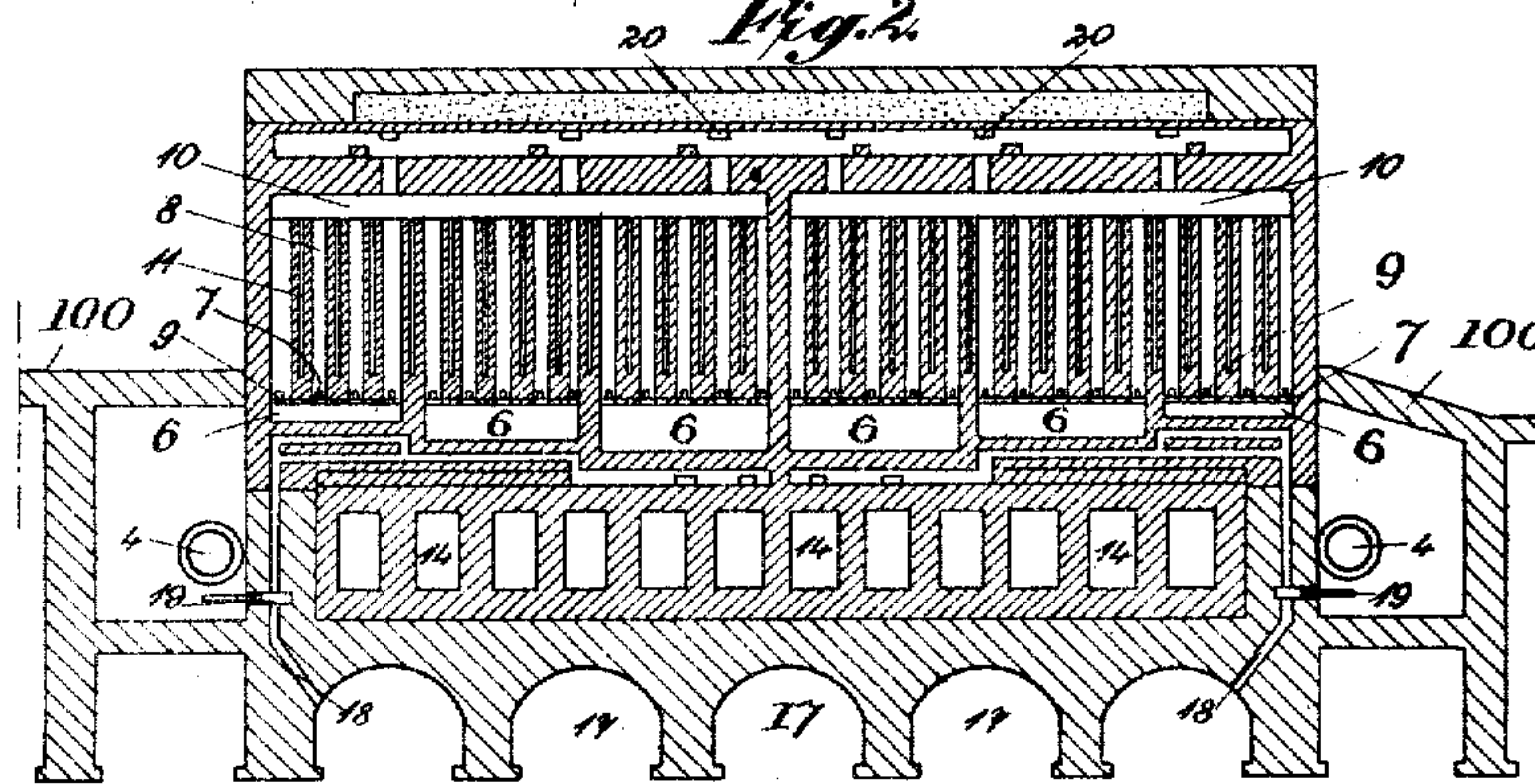
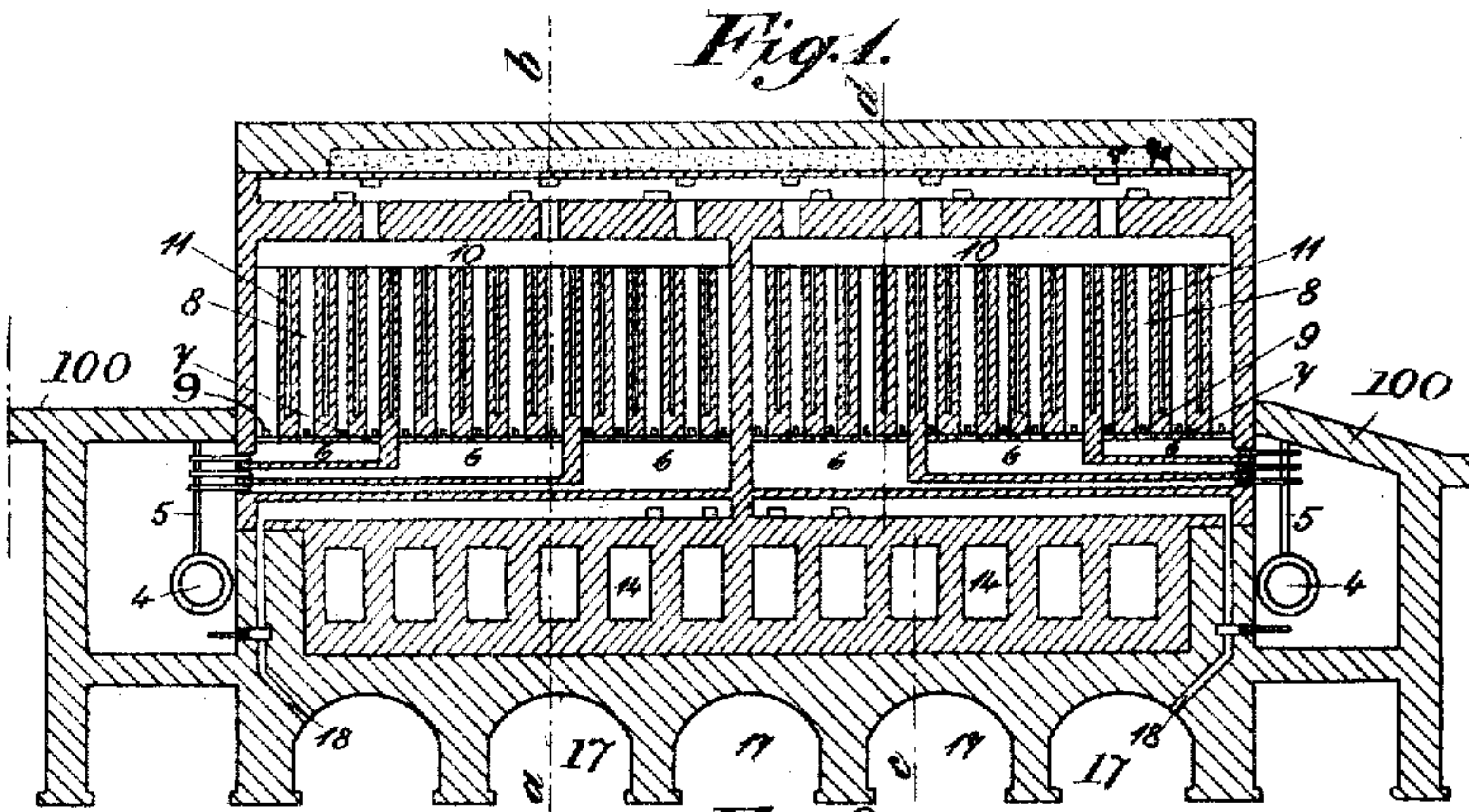


915,660.

F. J. COLLIN.
HORIZONTAL COKE OVEN.
APPLICATION FILED MAR. 14, 1905.

Patented Mar. 16, 1909.

3 SHEETS—SHEET 1.



Witnesses
Peter Kieber.
William Essensen.

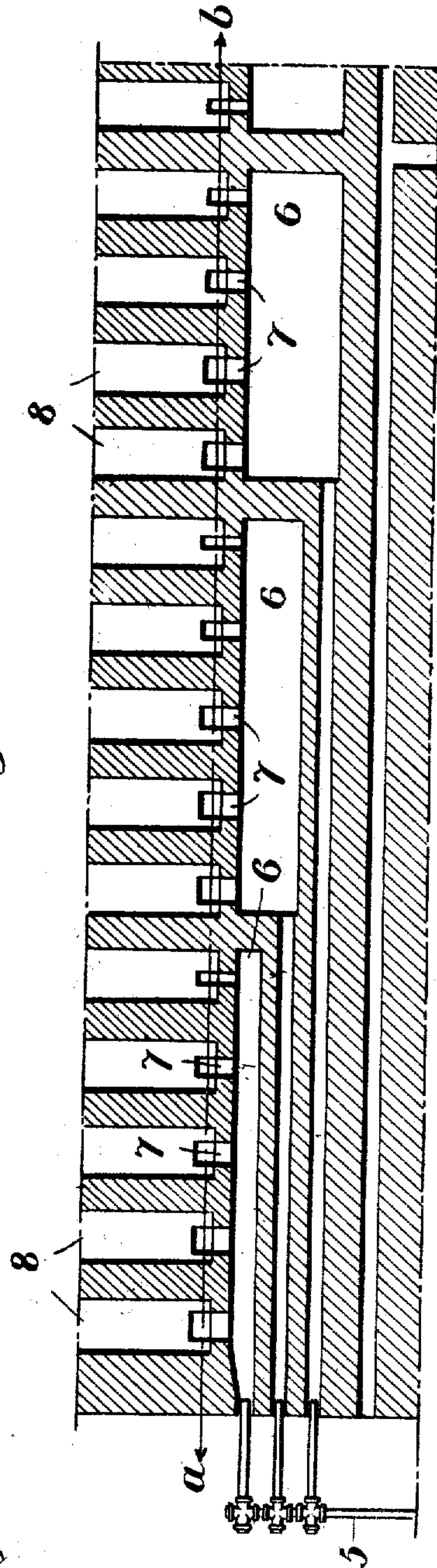
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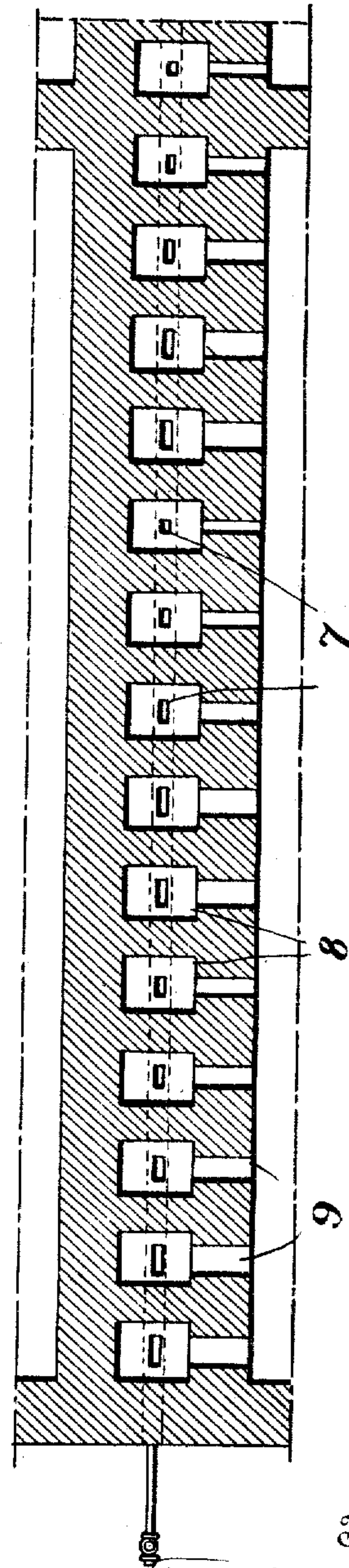
Patented Mar. 16, 1909.
3 SHEETS—SHEET 2.

Fig. 5^a.



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Fig. 5^b.



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3 SHEETS—SHEET 3.

Fig. 6.

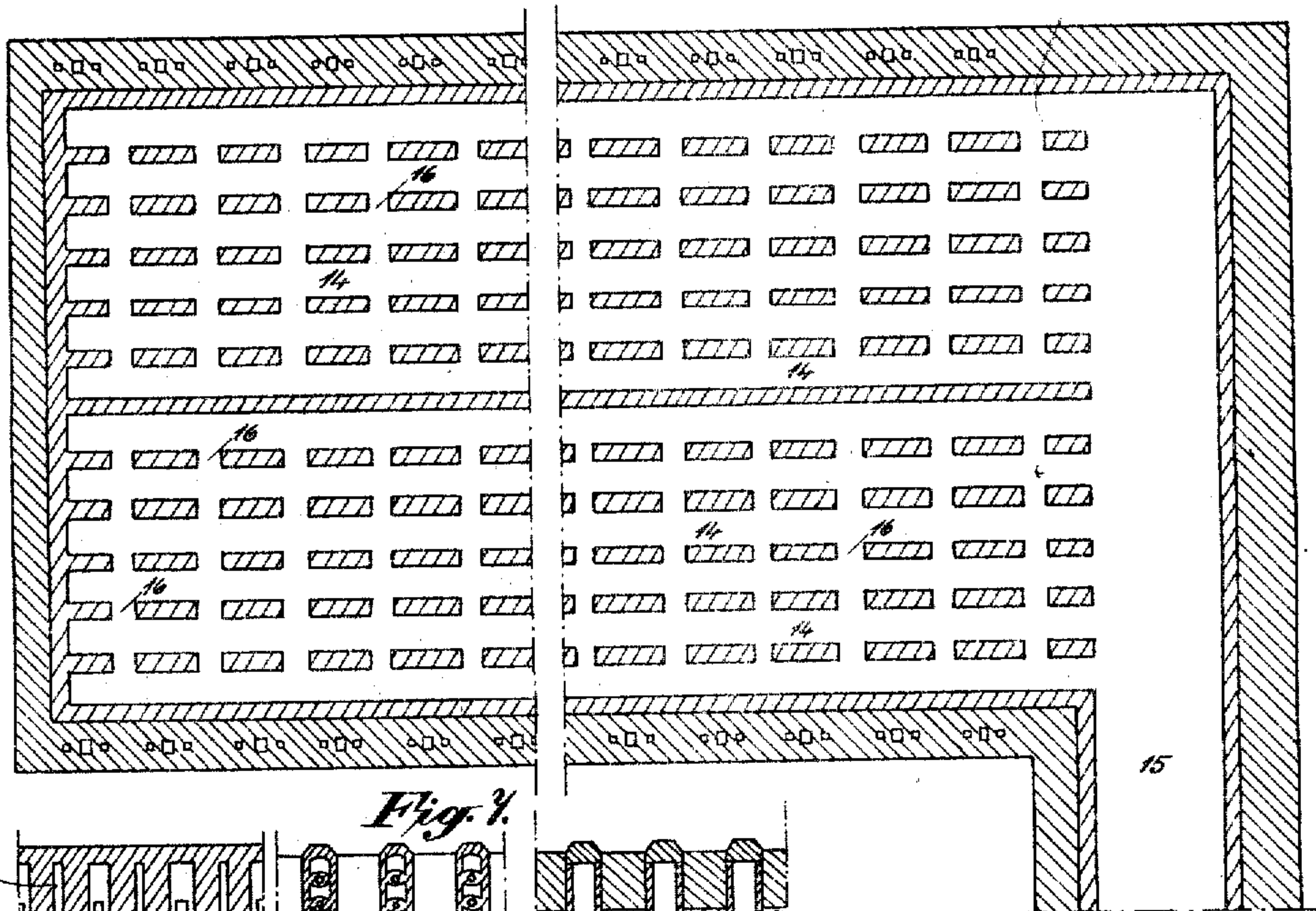
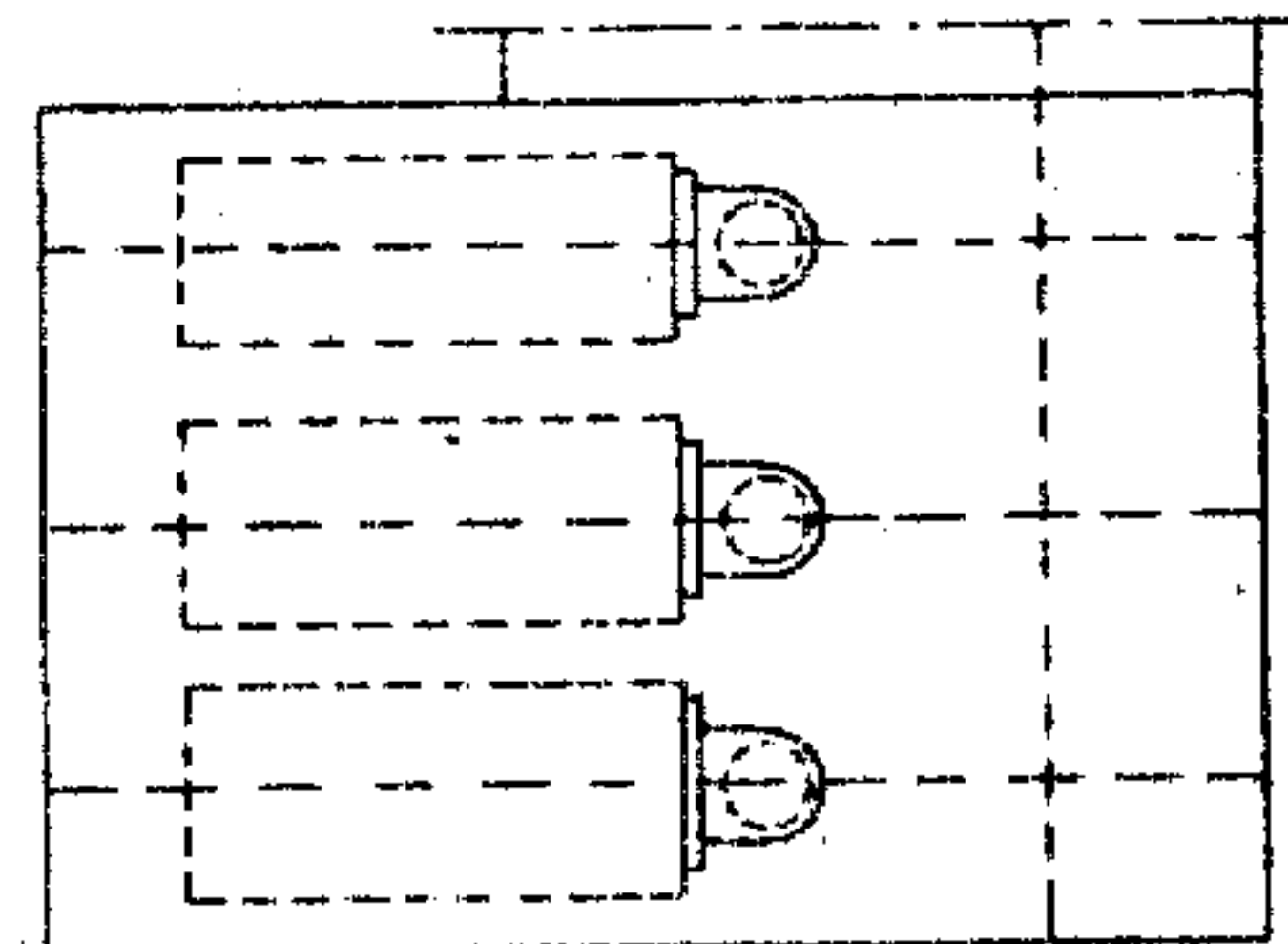
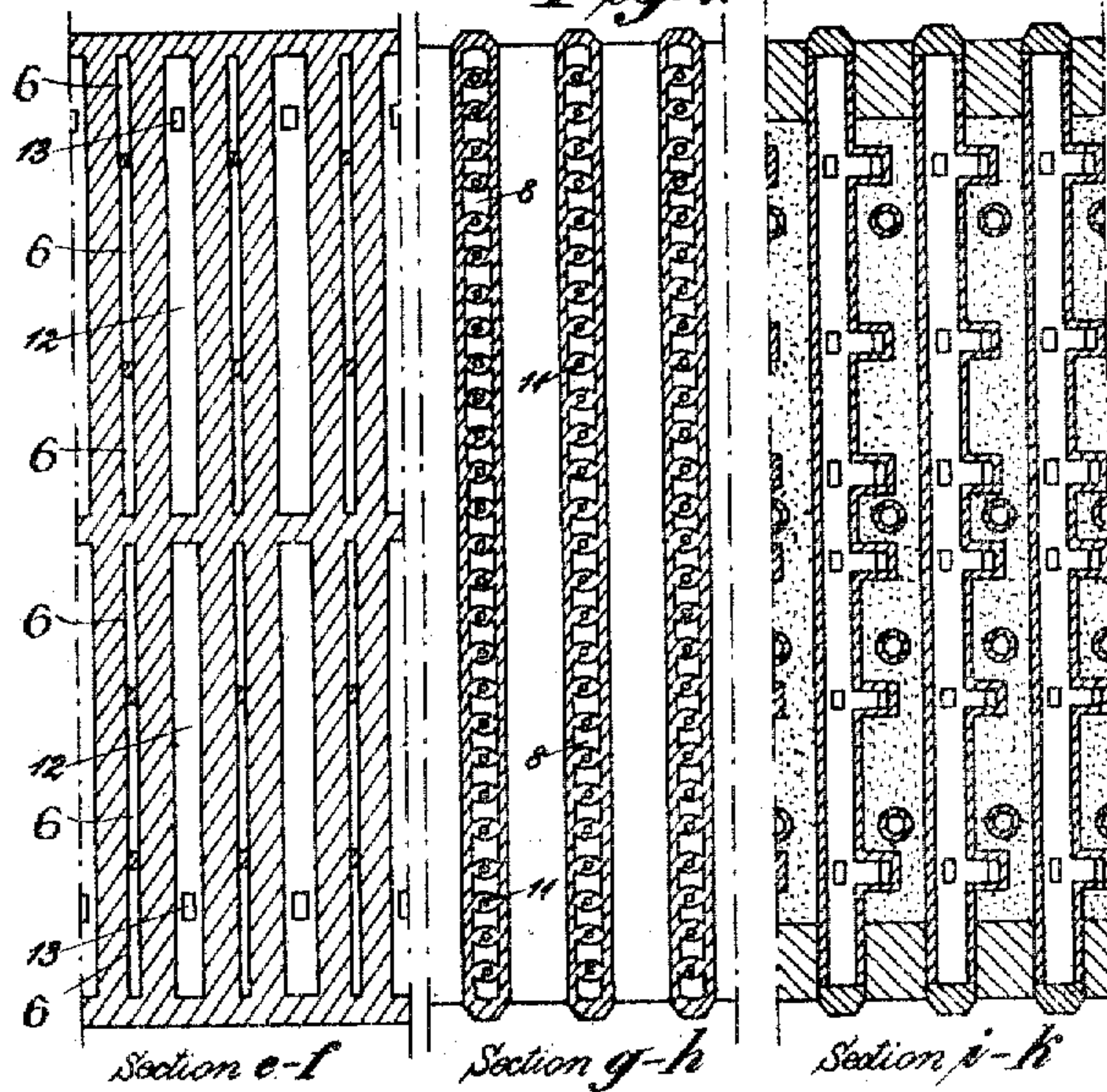


Fig. 7.



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UNITED STATES PATENT OFFICE.

FRANCIS JOSEPH COLLIN, OF DORTMUND, GERMANY.

HORIZONTAL COKE-OVEN.

No. 915,860.

Specification of Letters Patent.

Patented March 16, 1909.

Application filed March 14, 1905. Serial No 250,992.

To all whom it may concern:

Be it known that I, FRANCIS JOSEPH COLLIN, a civil engineer, and a subject of the King of Prussia, and residing in the city of Dortmund, Kingdom of Prussia and German Empire, have invented a certain new and useful Improvement in Horizontal Coke-Ovens, of which the following is a specification.

10 The various constructions of coke ovens which have become known within the past years, are chiefly intended for the purpose of producing a uniform heating of the walls; however, notwithstanding various experi-
15 ments, this aim has been accomplished but imperfectly. In a great number of cases the heating of the middle part of the oven and as a general rule the heating of the heads of the oven was not satisfactory. Even those
20 ovens, which are provided with a specially adjusted separate gas- and air admission conduit for each individual heating flue, are not capable of affording a uniform heating of the walls, such as is desirable and even required
25 for the purpose of obtaining an unvarying, uniform coking time. The principal deficiency is due to the fact that too little care is bestowed upon maintaining the uniformity of movement of the gases of combustion in
30 the heating channels themselves, apart from the more or less efficient distribution of gas and air. In consequence of this it is noted, that those channels which are farthest away from the channels or flues for the discharge
35 of the gases, are the most unsatisfactorily heated and particularly for the reason, because the insufficient movement within these channels does not admit of an intense, really economical combustion. The thus resulting
40 reduced generation of heat interferes largely with the duration of the coking and finishing period. By the construction of ovens, as represented in Figs. 1 to 7 of the drawing, it is intended to overcome these incon-
45 veniences by the fact, that an absolutely uniform distribution of heating gas and air of combustion extending lengthwise to the wall of the furnace, is used in connection with devices, which make it possible to produce
50 the before mentioned uniform suction in the several heating channels.

In the accompanying drawings:—Figure 1 shows a longitudinal section through a wall of the oven, the section being taken through
55 the gas admission channel; Fig. 2 is a longitudinal section through the air admission

channel; Fig. 3 shows a longitudinal section through the oven chamber; Fig. 4 represents transverse sections on the lines *a—b* and *c—d* in Fig. 1; Fig. 5 shows a horizontal sec- 60 tion through the heating channels and the gas escape channels of the wall of the oven. Fig. 5^a is a sectional view on an enlarged scale through one set of heating flues, showing the gas and air inlets; Fig. 5^b is a hori- 65 zontal sectional view on the line *a—b* of Fig. 5^a; Fig. 6 shows a horizontal section through the channels for the waste heat and Fig. 7 is a similar section through the bottom channels (*e—f*), the walls (*g—h*) and the connect- 70 ing gas transferring channels (*i—k*).

The oven chamber or coking chamber 1 is provided with the feed openings 2 (Fig. 3) and it is closed at both sides airtight by closely fitting doors (Figs. 3 and 7). The gases 75 which are liberated in the oven chamber 1, are sucked off through the openings 3 and are then conducted to a condensing device which consists of coolers and washers, and, after having been freed from the valuable by- 80 products, the gases are allowed to enter into the ovens through the pipes 4 (Fig. 1) for the purpose of heating the ovens. The pipes 5 are intended for the distribution of the gas in the gas distributing channels 6 (Fig. 1) which 85 are provided with openings 7 to connect them with the heating flues or channels 8, the sectional areas of which are preferably decreasing, the farther they are remote from the gas entrance. By making the openings 7 90 in the form and arranging them in the manner described, a uniform supply of gas from the gas distributing channels is provided. If all of the openings 7 were of the same width those farther from the supply end of the 95 channel would receive a greater supply of gas than those nearer said supply end owing to the pressure under which the gas enters the channel. By having the openings decrease in width as described a more uniform supply 100 of gas is effected. The gas which is thus admitted into the heating channels 8, is provided with the necessary air of combustion through the openings 9 (Figs. 1 and 2). The burning gas then ascends in the heating 105 channels 8, passes through the draft compensating channel 10 and then descends through separate gas discharge channels 11, which are cut out in the bond-stones, and into the channels 12 in the bottom of the oven; 110 then the gases pass through the openings 13 (Fig. 3) into the waste heat channels 14.

which are united at the outside of the system of chambers into one flue 15 (Fig. 6) leading to the boiler house. Housings 100 are provided for the protection of the pipes 4.

5 The sucking off through the discharge channels 11 presents the following advantages:—In the first place an absolutely uniform action of the draft within the wall is obtained, as already mentioned above, and
10 in the second place it becomes possible, to admit the waste heat to the bottom channels with the same temperature which it has acquired in the upper part of the wall, so that the waste heat suffices for the heating of the
15 bottom of the oven. Furthermore gases of distillation are prevented from getting into the gas discharge channels 11 from the oven chamber and from getting lost, so that their by-products may be utilized in the condensing
20 plant. Then, the formation of darker, that is to say less heated parts in the walls of the oven is avoided in view of the suction of the gases being made to extend everywhere over the entire length of the oven. The stability
25 of the wall is increased by this arrangement, in view of the gas transferring overhead channel 10 being made of smaller sectional area than is usual in the case of ovens, in which the gases are sucked off at only one
30 place on the wall of the oven.

Hereinafter the arrangement of the waste heat channels 14 is to be specially considered, which take up the entire space below the system of oven chambers and
35 which are connected to each other by lateral openings 16 (Fig. 6). The utility of this arrangement is apparent: In the first place it prevents the formation of cracks and fissures in the bottom channels and in the walls of
40 the oven, which are liable to occur in the case of large waste heat channels, constituting only one chamber, below the ovens, in consequence of the expansion of the stones over the waste heat channels, notwithstanding
45 the arrangement of protecting vaults and of empty spaces. In this form of construction any movement of the stone material of the waste heat channels does not interfere injuriously with the masonry of the oven
50 above the said channels, because the movement and the expansion are evenly distributed. In the second place less heat is lost from the ovens. The radiating heat of the waste heat channels 14 in the upper direction
55 is utilized by the ovens and by the bottom of the ovens, while the heat radiating in the downward direction is utilized by the cold air of combustion which enters from the outside into the arches 17 of the foundations
60 (Figs. 1, 2, 3) and which is submitted in this manner to a valuable preliminary heating. The air passes from the vaults 17 of the foundations through the air channels 18 (Figs. 1 and 2) and into the air distributing
65 openings 9. The air admission channels 18

are so arranged at the sides and below the gas admission channels, that they are acting as a means to cool the said channels or to keep them at a temperature which will prevent the deposition of graphite in the gas
70 admission channels. The admission of air is regulated by the slides 19 (Figs. 1 and 2). The small openings 20 which are provided in the ceiling of the oven chamber and above the side wall (Figs. 1 to 3) are left open when
75 the ovens are worked without recovery of by-products. When the heating of the ovens is started, the gases pass from the oven chamber and through the openings 20 into the wall channels, where they are burned and they
80 are then conducted through the gas discharge channels into the bottom of the oven and thence into the waste heat channels.

What I claim and desire to secure by Letters Patent of the United States is:— 85

1. A horizontal coke oven provided with vertical heating channels and with gas distributing channels arranged below the heating channels and having openings or slots connecting said gas distributing channels
90 with the several heating channels, the openings or slots being formed in such a manner that those lying next to the gas entrance are of greater sectional area than those lying farther away. 95

2. In a coke oven, the combination with vertical heating channels, of gas distributing channels arranged below and communicating with the heating channels, air conduits opening into said heating channels above the inlets
100 of the gas distributing channels, a collecting channel above and communicating with the heating channels, and bond stones connecting the walls of the heating channels and having formed therein discharge channels that lead
105 from said collecting channel to the bottom of the oven.

3. In a coke oven, the combination with vertical heating channels, of a gas distributing channel arranged below and communicating
110 with a plurality of said heating channels through inlets which decrease in size from the supply end of said gas channel, independent channels for supplying air to each heating channel above the inlet from the gas chan- 115
nel, a collecting channel communicating with the heating channels, and bond-stones connecting the walls of the heating channels and having formed therein discharge channels which communicate with outlets in said col- 120
lecting channel and lead to the bottom of the oven.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

FRANCIS JOSEPH COLLIN.

Witnesses:

PETER LIEBER,

WILLIAM ESSENWEIN.