

No. 684,116.

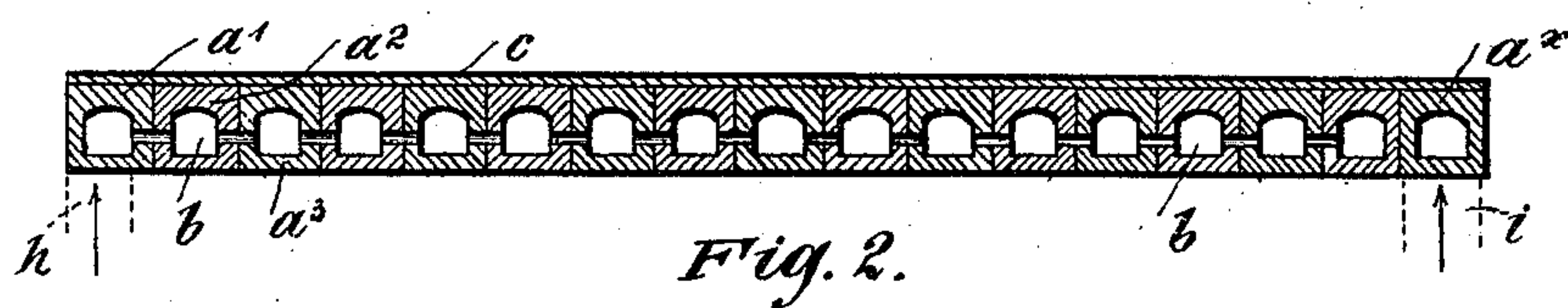
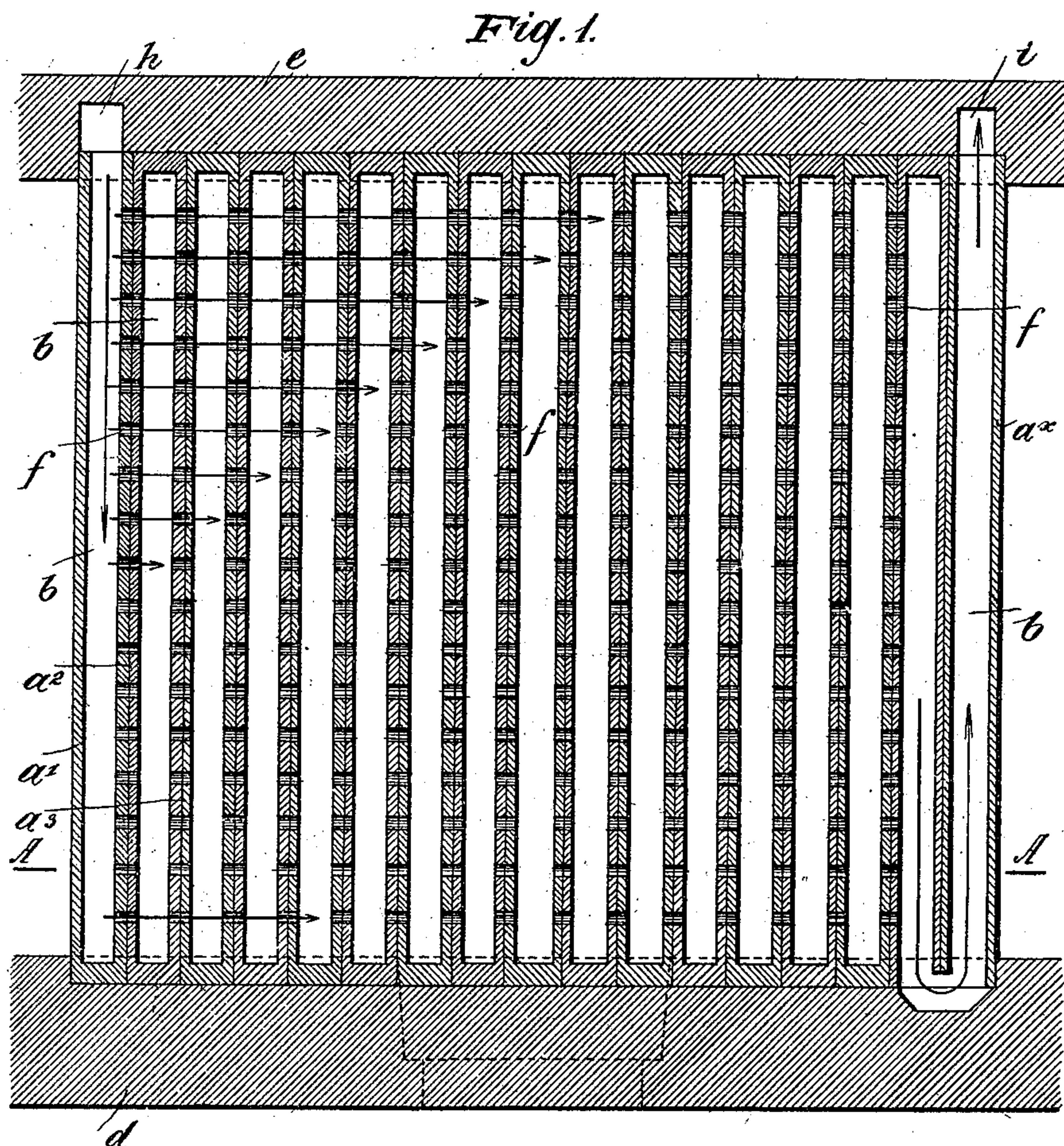
Patented Oct. 8, 1901.

H. SIEGWART.
FLOOR AND CEILING.

(Application filed Jan. 22, 1901.)

(No Model.)

5 Sheets—Sheet 1.



Witnesses:

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Fig. 3.

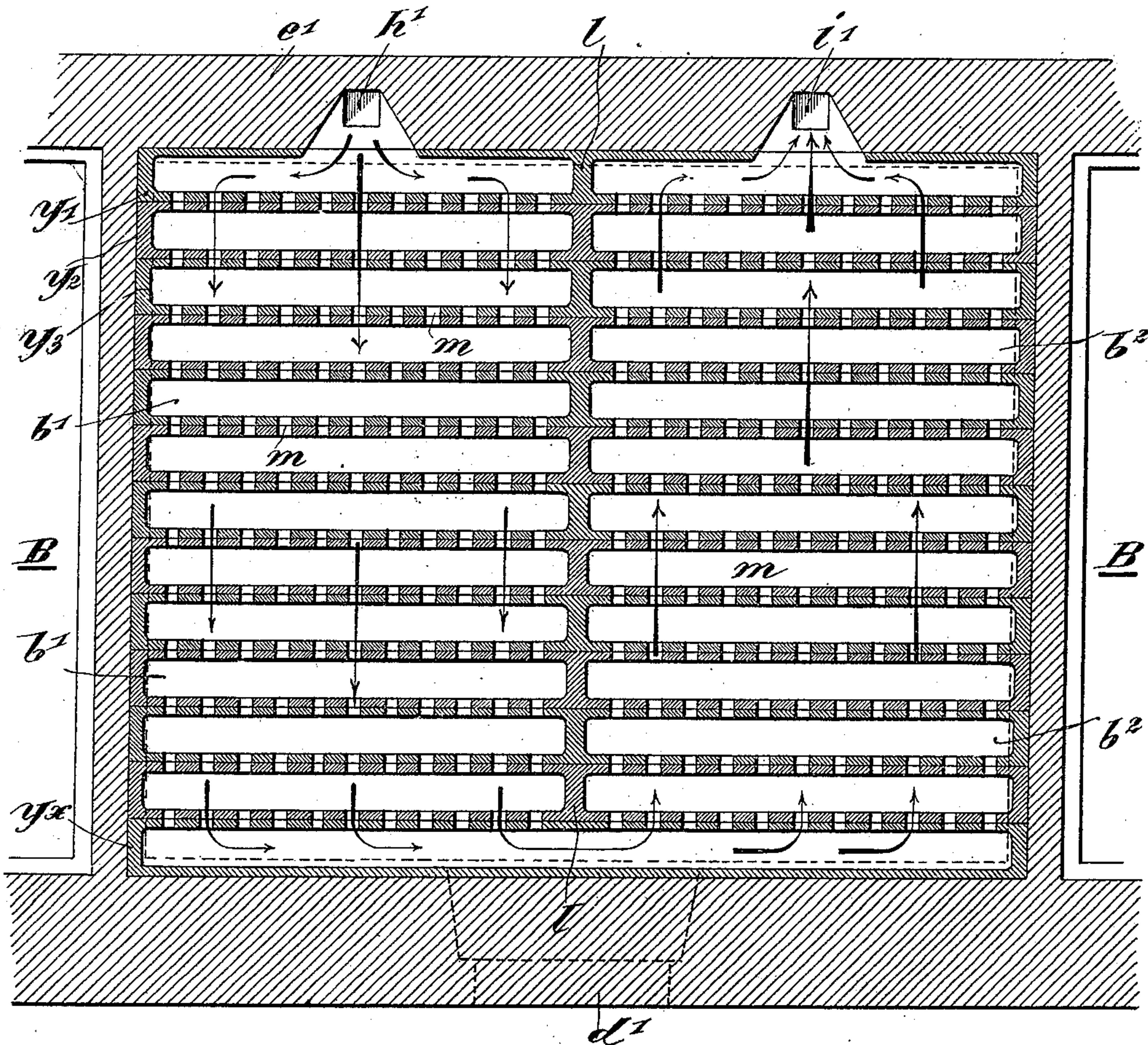


Fig. 4.



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Fig. 5.

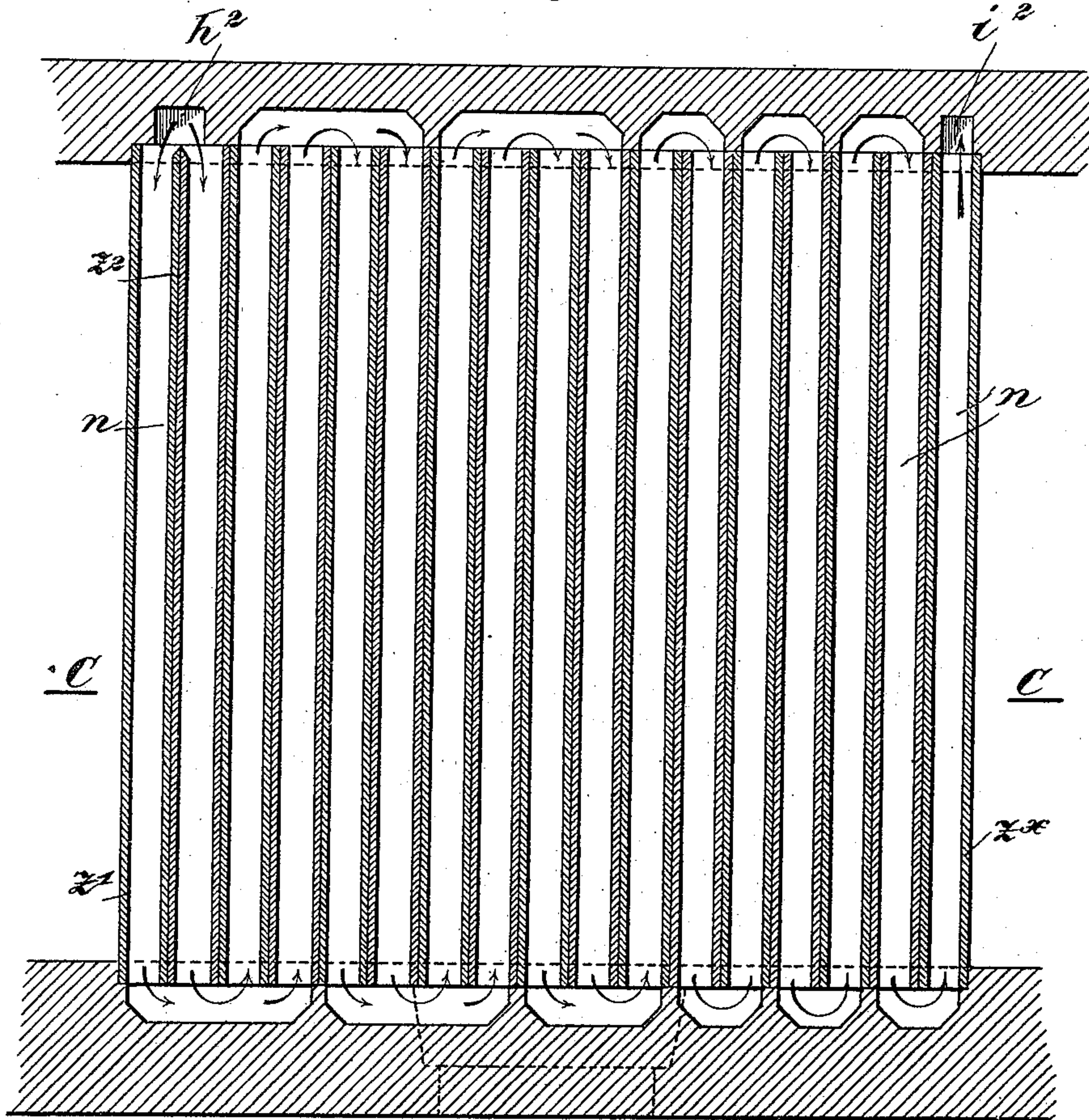
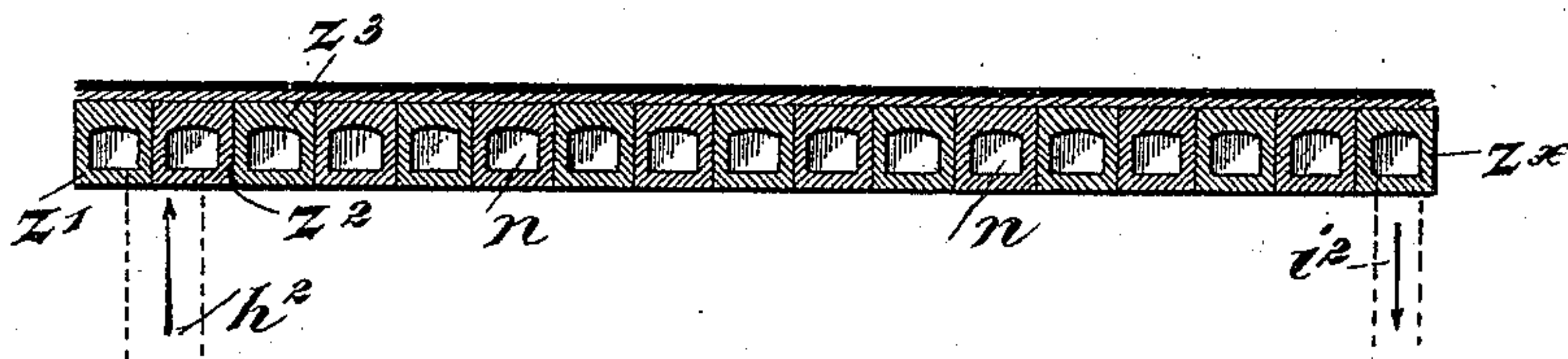


Fig. 6.



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Fig. 7.

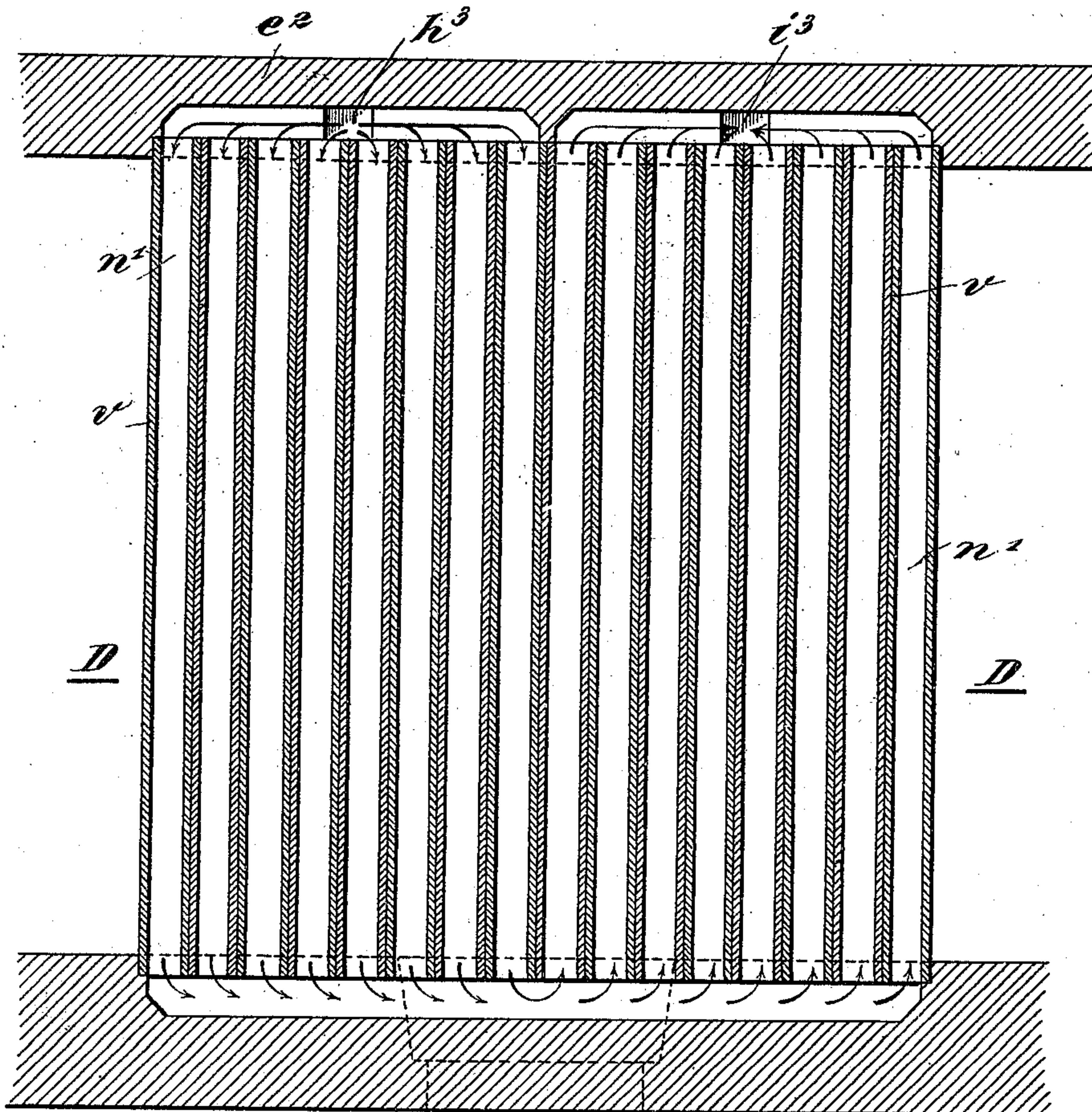
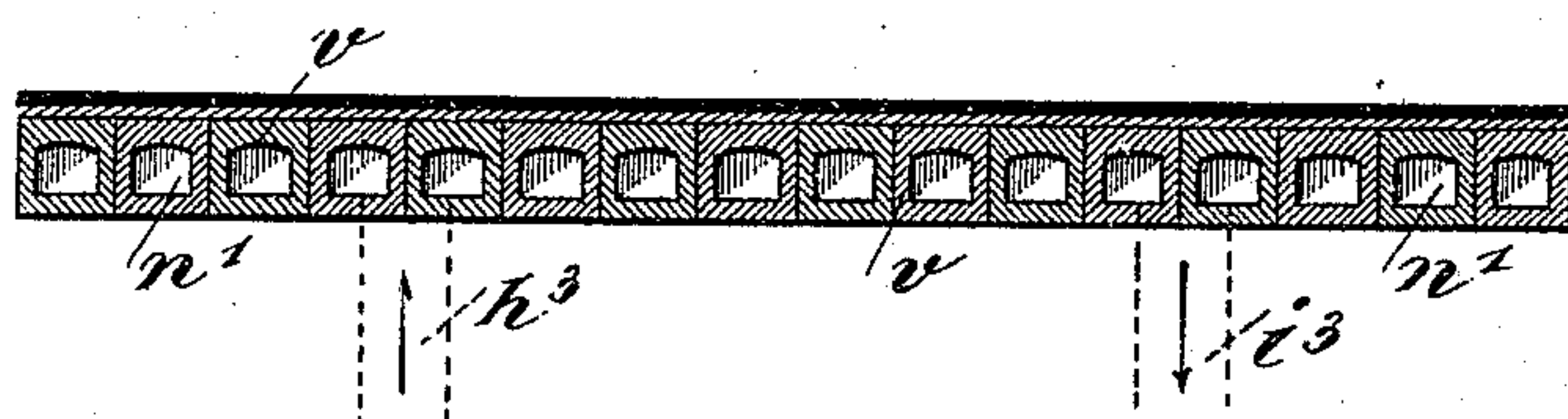


Fig. 8.



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Att'y.

No. 684,116.

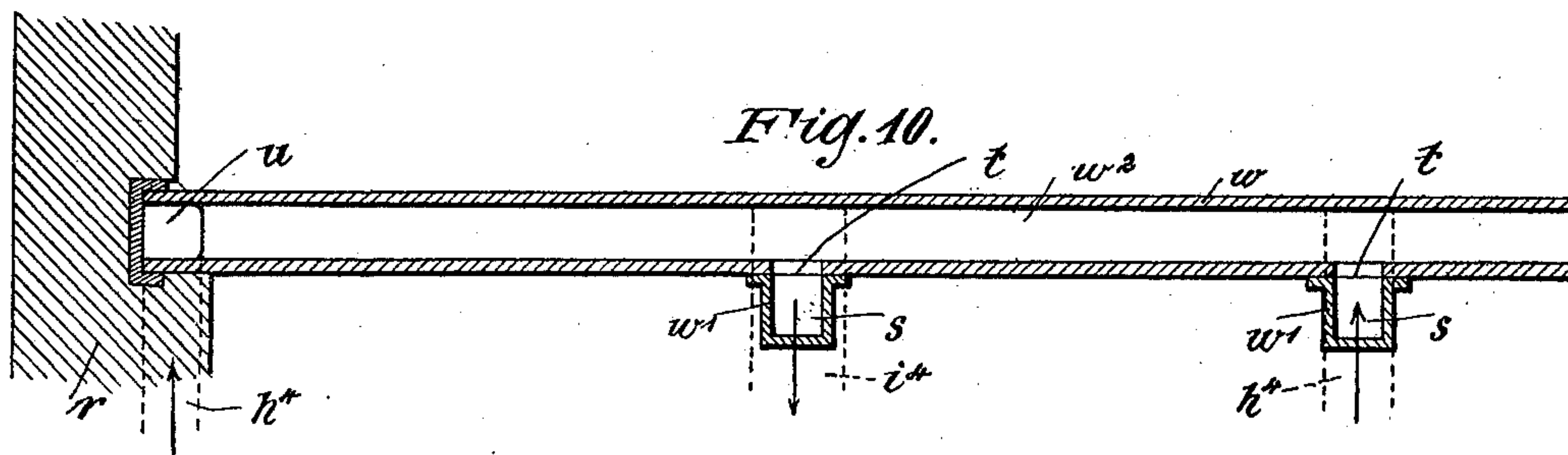
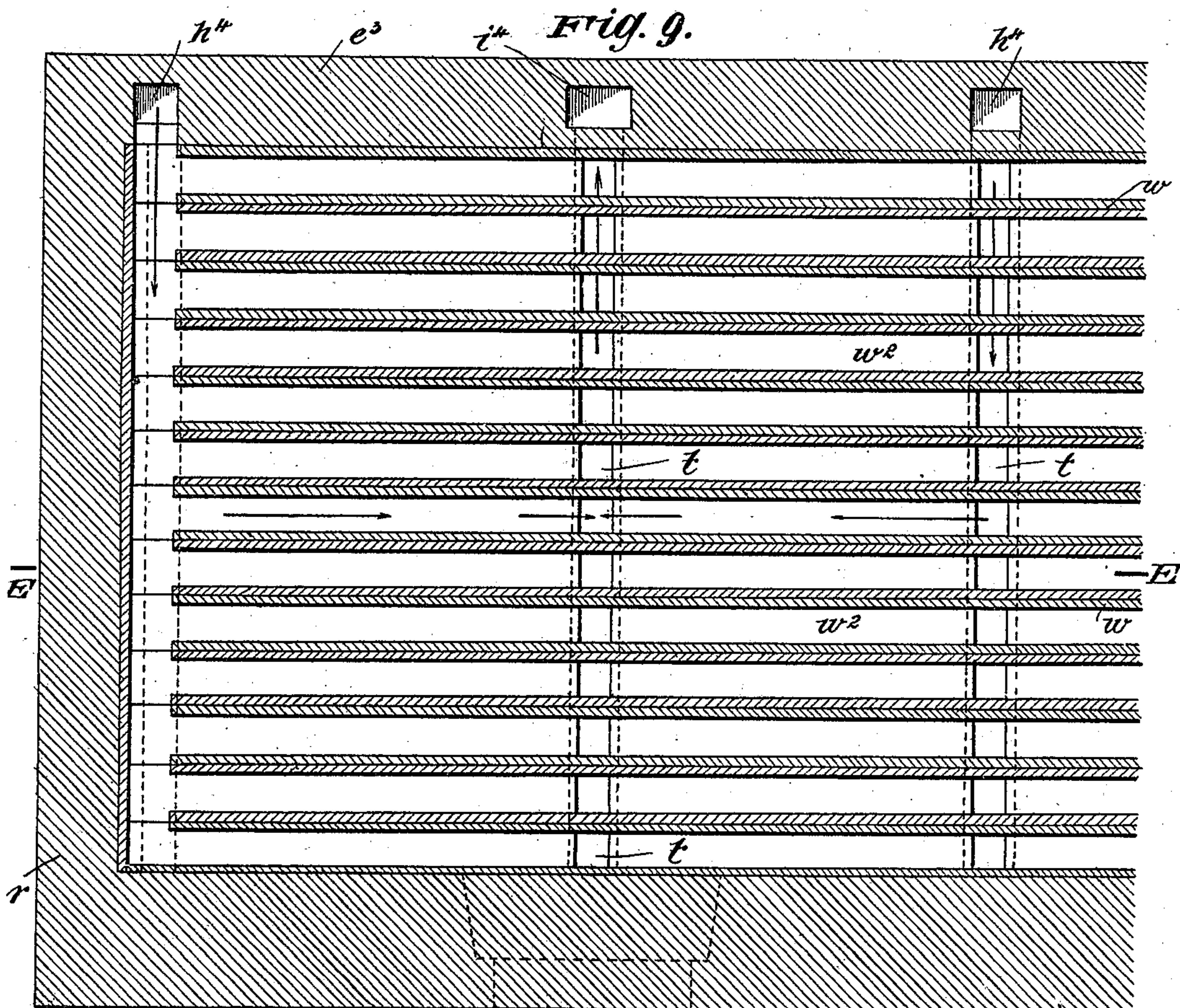
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5 Sheets—Sheet 5.



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UNITED STATES PATENT OFFICE.

HANS SIEGWART, OF LUCERNE, SWITZERLAND.

FLOOR AND CEILING.

SPECIFICATION forming part of Letters Patent No. 684,116, dated October 8, 1901.

Application filed January 22, 1901. Serial No. 44,311. (No model.)

To all whom it may concern:

Be it known that I, HANS SIEGWART, a citizen of the Republic of Switzerland, residing at Lucerne, Switzerland, have invented new and useful Improvements in Floors and Ceilings, (for which I have applied for a patent in Switzerland, dated June 28, 1900, application No. 24,284,) of which the following is a specification.

The present invention has reference to improvements in floors and ceilings in buildings, and relates more especially to floors or ceilings used as heat or cold transmitters for heating or cooling rooms; and the object of the invention is to provide a floor or ceiling, respectively, which allows of a constant current of the heating or cooling medium passing in at one side, circulating freely through it, and passing out at the other side, as will hereinafter more fully be explained, reference being had to the drawings.

Figure 1 is a horizontal section through a floor or ceiling according to the present invention. Fig. 2 is a section on line A A of Fig. 1. Fig. 3 is a horizontal section through a modification. Fig. 4 is a section on line B B of Fig. 3. Figs. 5, 7, and 9 are horizontal sections through as many modifications. Figs. 6, 8, and 10 are sections on lines C C, D D, and E E, respectively, of Figs. 5, 7, and 9.

Referring to Figs. 1 and 2, the beams a' , a^2 , a^3 to a^x are provided with longitudinal channels b , running parallel to each other when the beams have been laid out alongside of each other. These beams consist, preferably, of concrete bound with iron sheeting. They are carried in the ordinary manner by the vertical walls d e of the room and carry in turn the flooring or covering c and serve at the same time as ceiling for the underlying room. The walls of these beams touching each other are provided with corresponding apertures or passages f , thereby placing the channels b into communication, as is clearly shown in the drawings. The adjoining walls of the last beam a^x and the one next to this last beam are not perforated. In the wall e are provided vertical flues h i . The one of these—for instance, h —is in connection with a source of heat or cold, (not shown in the drawings, as forming no part of the invention,) and the other flue i is in connection with the chimney

or also with the source of heat or cold for reheating or recooling the air or the other medium sent through the beam system. The longitudinal channels of the first beam a' and of the last beam a^x are open at the ends, resting in the wall e , and communicate with the flues h and i , respectively. The channels b of the last beam and the one next to this last beam also communicate at the ends resting in the wall d . The cooling or heating medium being forced up the flue h enters the longitudinal channel of the first beam a' , flows through the various channels and passages of the beam system, and finally enters the outflue i , which preferably carries it back to the source of heat or cold, respectively, to be used over again.

Referring to Figs. 3 and 4, the beams y' , y^2 , y^3 to y^x are provided with longitudinal channels and passages m . The channels are divided by the partition-wall l into two halves b' and b^2 . The beams are arranged parallel to the wall e' , which is provided with an influe h' and an outflue i' . The beam nearest to the wall e' is provided with two apertures, one in either half b' b^2 , corresponding to the flue-openings. The longitudinal channel of the last beam y^x is not divided. The cooling or heating medium entering through the flue h' passes first through the the beam-halves b' , through the last beam y^x into and then through the beam-halves b^2 , and out through the flue i' .

Referring to Figs. 5 and 6, the beams z' , z^2 , z^3 to z^x are provided with channels n . These channels are connected by passages provided in the sustaining-walls in such a way that the cooling or heating medium is forced to take a zigzag course through the channels, entering through flue h^2 and escaping through flue i^2 . The left half of Fig. 5 shows a construction where the channels are arranged in pairs, whereas the right half shows an arrangement of single channels.

With reference to Figs. 7 and 8 the beams v are provided with channels n' . The wall e' contains the influe h^3 and the outflue i^3 . The beams are all open at both ends and communicate at one end by means of a passage provided in the sustaining-wall and communicate at the other end by means of two passages provided in the wall e^2 , so that two

groups of beams are formed. The cooling or heating medium entering through the flue h^3 flows through the beams of the first group, passes over into and through the beams of the second group, and out through the flue i^3 , as is shown by the arrows in the drawings.

Referring to Figs. 9 and 10, the beams w are provided with longitudinal channels w^2 and are arranged parallel to the wall e^3 , containing two influes h^4 and an outflue i^4 . The influes are arranged one at either side of the outflue. Below the beams w are arranged two cross-beams w' , with channels s communicating through passages t in the beams w with the channels w^2 . The channel s of the one cross-beam communicates with the outflue i^4 and the channel s of the other cross-beam with the right influe h^4 . The cooling or heating medium entering through flue h^4 passes into and through the channels of the cross-beams w' , into and through the channels w^2 , then into the middle cross-beam w' , and out through flue i^4 . The ends of the beams w are closed by a U-shaped cap and rest within the wall r . The adjoining walls of the beams w are provided with corresponding passages u , which take the place of the channeled cross-beams w' .

In a building provided with floors or ceilings of the described construction these floors or ceilings may all be supplied from a common source of heat or cold, or the floors or ceilings of each story may have a separate source of heat or cold.

Instead of using single-channeled beams the floor or ceiling may also consist of a solid cast mass channeled in the described manner.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is--

1. A floor or ceiling containing a series of internal flues, in combination with a flue for supplying a heating or cooling agent and an exhaust-flue, said series of flues so connected

with one another and with the supply and exhaust flues as to cause the heating or cooling agent to flow through all the flues of the series before it reaches the exhaust-flue, for the purposes set forth.

2. A floor or ceiling containing a series of internal flues, in combination with a flue for supplying a heating or cooling agent thereto, means for distributing such agent to one set of the series of flues, an exhaust-flue in communication with another set of said flues, the series of flues so connected with one another as to cause the heating or cooling agent to circulate through all of them before it reaches the exhaust-flue, for the purpose set forth.

3. A floor or ceiling containing a series of flues divided into groups or sets by a partition or partitions, in combination with a flue for supplying a heating or cooling agent, and an exhaust-flue, the flues of a group so connected with one another and the groups of flues so connected with the supply and exhaust flues as to cause the heating or cooling agent to flow through the entire series of flues from group to group before said agent reaches the exhaust-flue, for the purpose set forth.

4. In a building the floors or ceilings of which contain series of flues, in combination with a vertical flue for supplying a heating or cooling agent and a similar exhaust-flue, both in communication with the series of flues in the superposed floors or ceilings, said supply and exhaust flues and said floor or ceiling flues so connected and arranged as to cause the heating or cooling agent to circulate through the series of flues in the several floors or ceilings before being exhausted into the atmosphere, for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HANS SIEGWART.

Witnesses:

MORITZ VEITH,

A. LIEBERKNECHT.