

J. MIYABARA.
BAFFLE FOR WATER TUBE BOILERS.

APPLICATION FILED AUG. 3, 1901.

NO MODEL.

2 SHEETS—SHEET 1

Fig. 2.

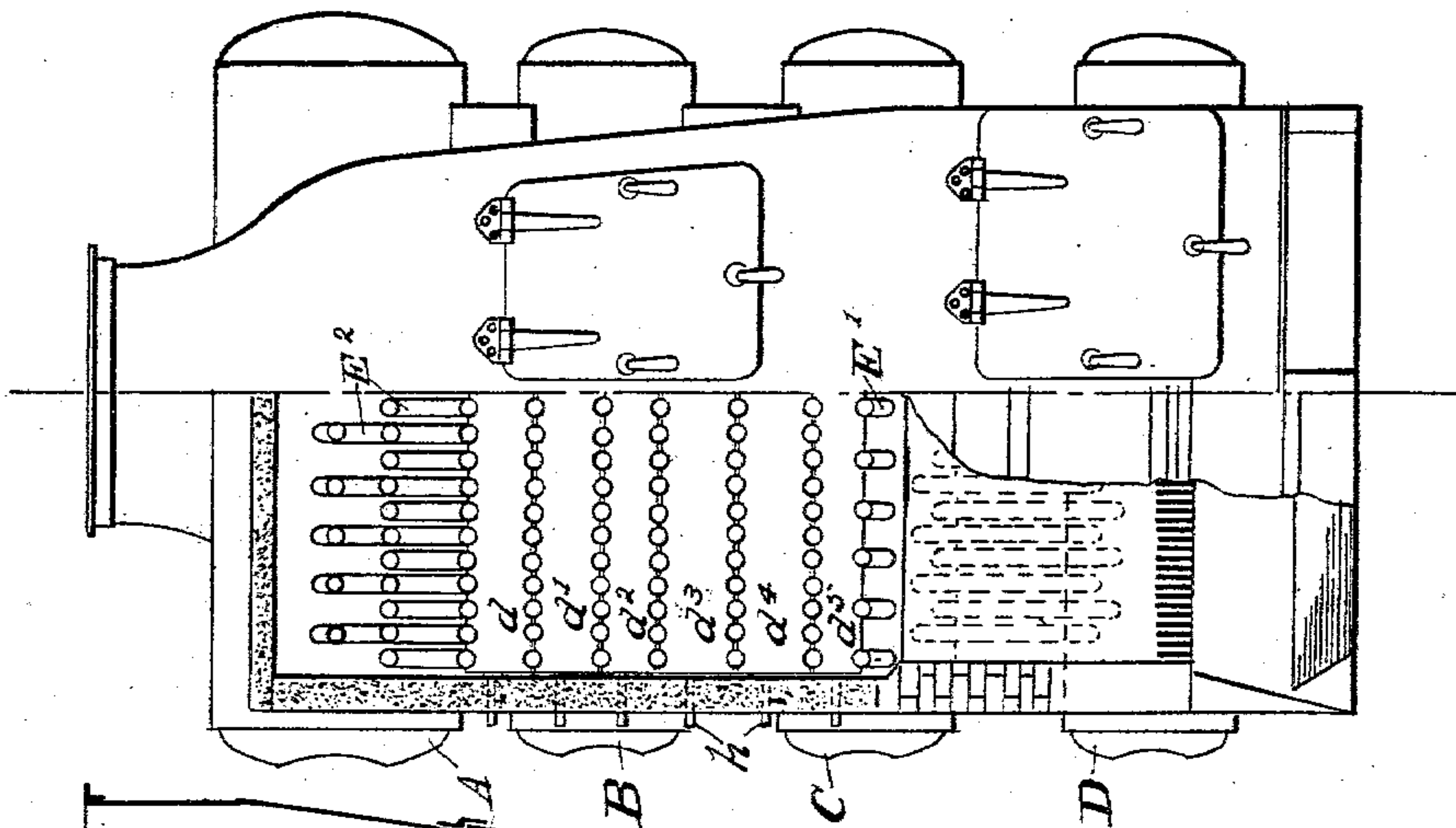
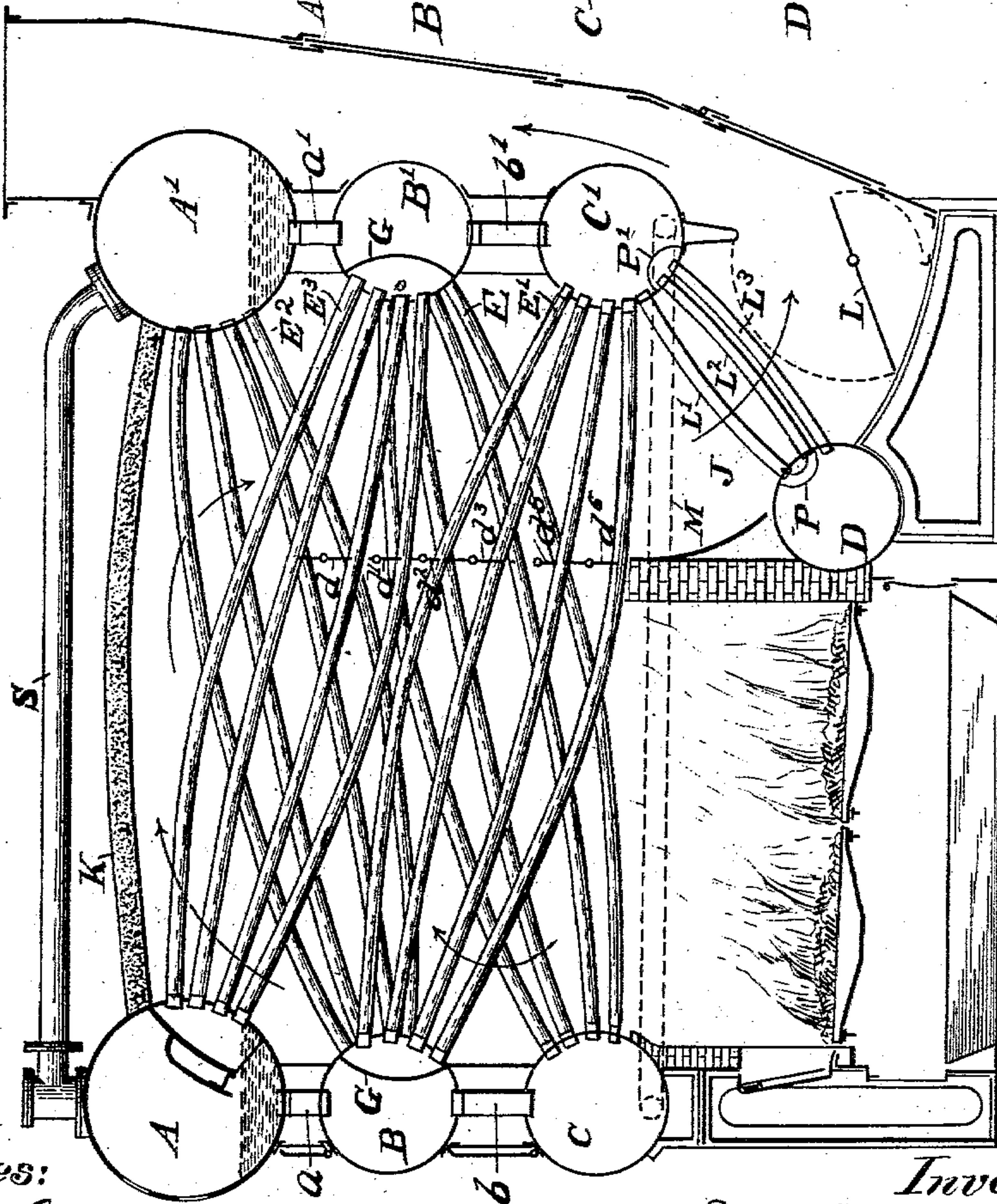


Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 4.

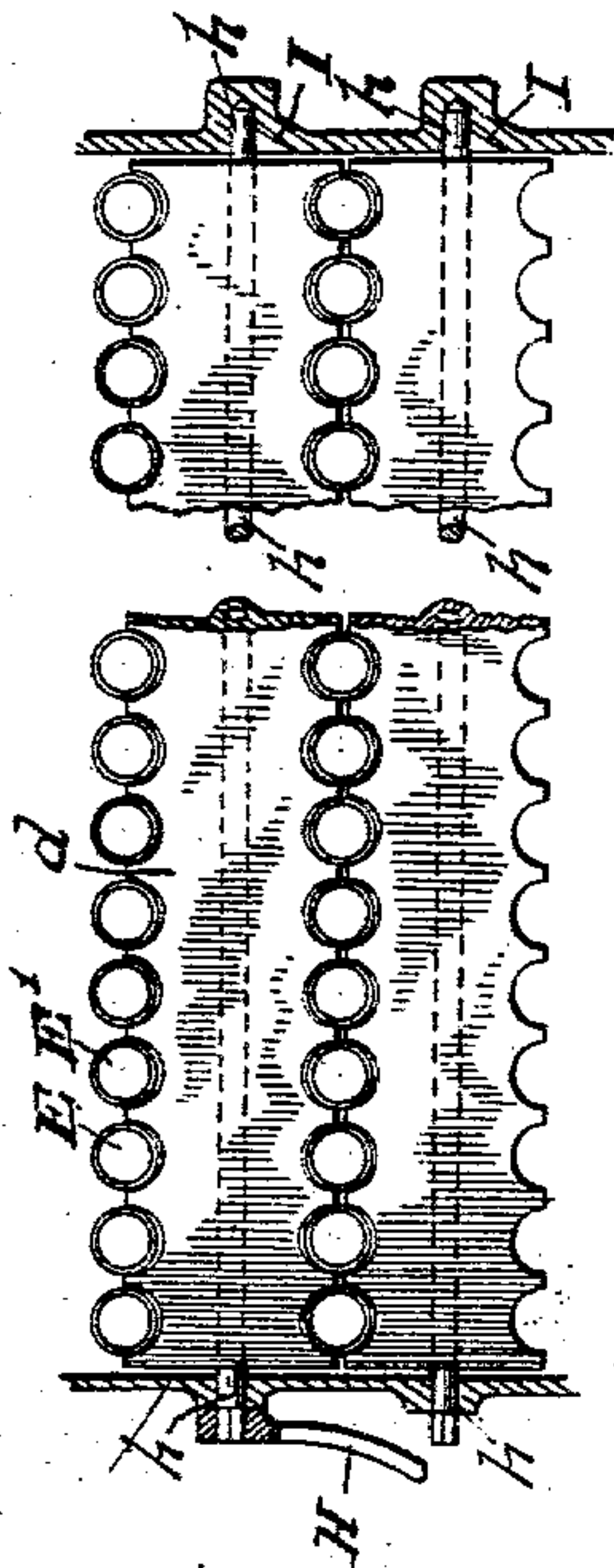


Fig. 5.

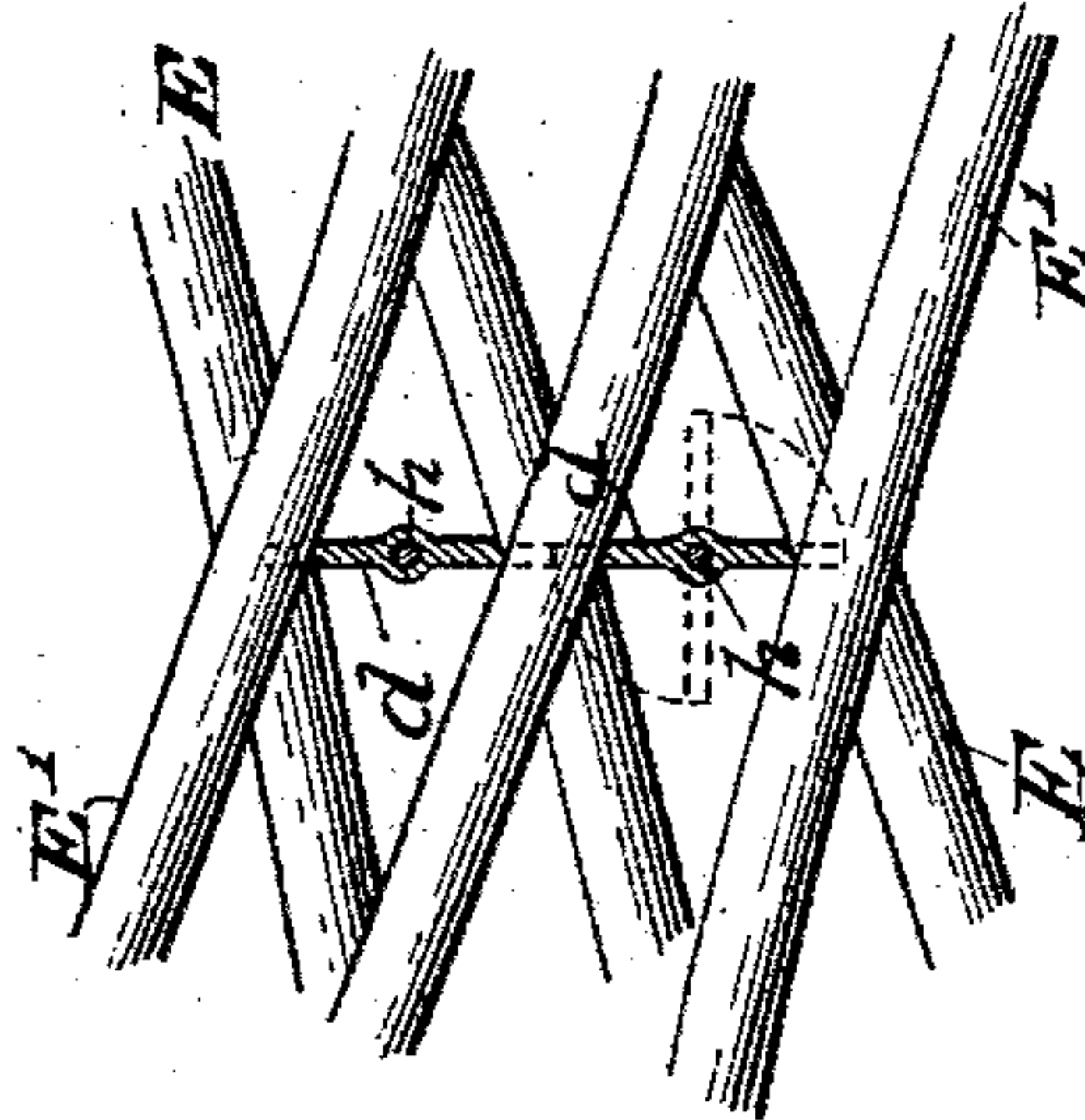
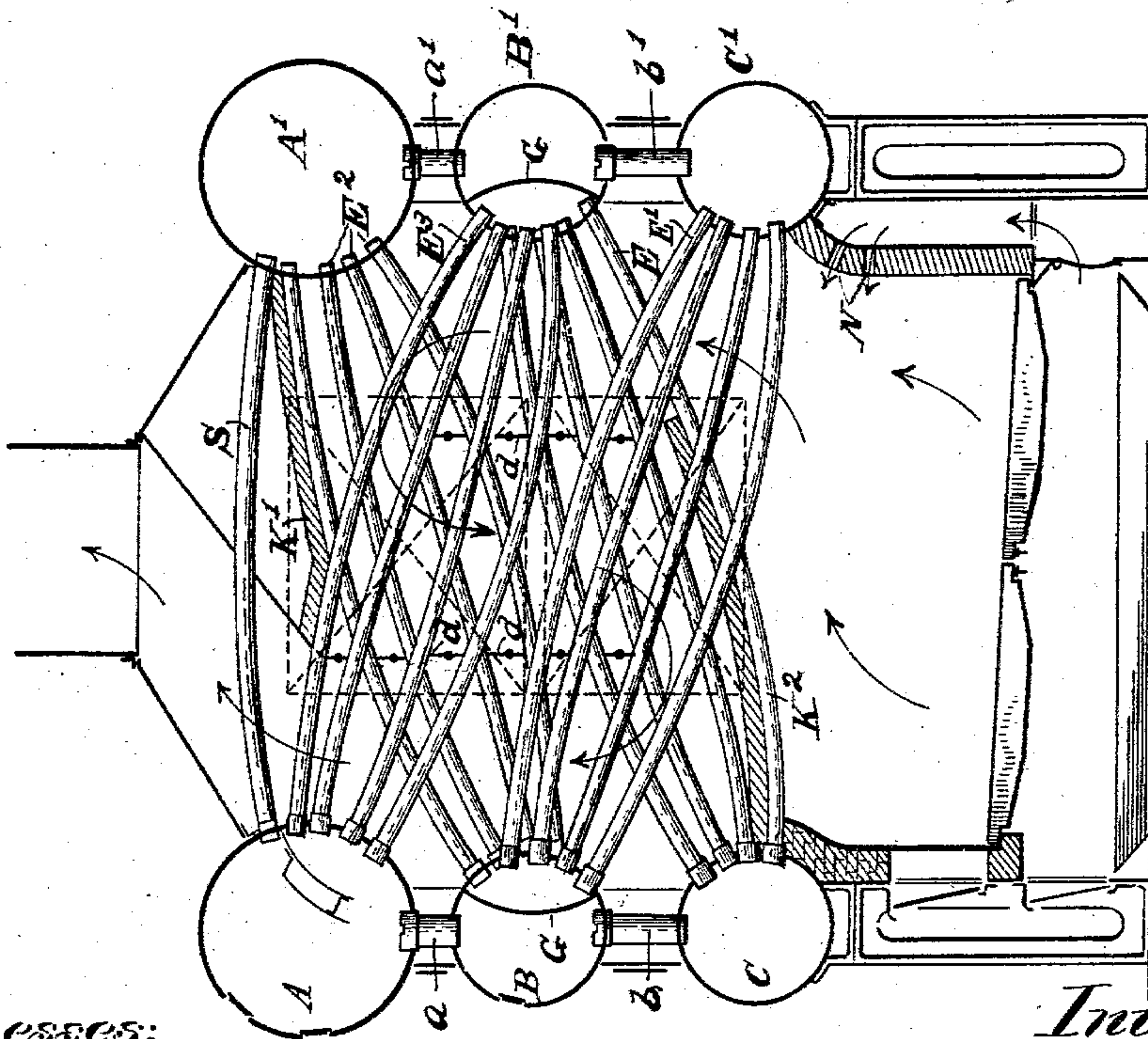


Fig. 3.



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JIRO MIYABARA, OF TOKIO, JAPAN.

BAFFLE FOR WATER-TUBE BOILERS.

SPECIFICATION forming part of Letters Patent No. 743,541, dated November 10, 1903.

Application filed August 3, 1901. Serial No. 70,723. (No model.)

To all whom it may concern:

Be it known that I, JIRO MIYABARA, a subject of the Emperor of Japan, and a resident of Tokio, Japan, have invented a new and Improved Baffle for Water-Tube Boilers, of which the following is a full, clear, and exact description.

My invention relates to improvements in water-tube boilers, and particularly to those of the type shown in my United States Patent No. 633,699, of September 26, 1899.

My invention comprises the novel features which will be hereinafter described and particularly pointed out in the claims.

In the drawings accompanying herewith and forming a part of this specification I have shown my invention embodied in the form which is at present preferred by me.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional elevation of a boiler taken from front to rear or in the direction of the tubes. Fig. 2 is a rear elevation of a boiler, one-half being a section taken back of the baffle-plates shown in Fig. 1. Fig. 3 is a sectional elevation similar to Fig. 1 of a slightly-modified form of boiler. Figs. 4 and 5 are details showing the baffle-plates and their position relatively to the tubes.

The general form of my boiler consists of a plurality of chambers, preferably cylindrical shells, as A, B, and C, connected by short water-circulating tubes *a b* at one end of the boiler, and similar chambers, as the shells A', B', and C', connected by the water-circulating tubes *a' b'* at the other end of the boiler, and series of inclined water-circulating tubes, as E, E', E², and E³, connecting each of the chambers with the chamber next above it in position at the opposite end of the boiler, the same being in this respect substantially like the boiler shown in my previous patent, No. 633,699, previously referred to. These chambers, with their connecting water-circulating pipes, form two water-walls at opposite ends of the furnace, and the individual chambers act as headers for the reception of the series of inclined tubes which connect opposite walls. The chambers intermediate the end

ones of either series, as the chambers B and B', have deflecting-diaphragms G, which separate the upward and downward currents.

As shown in Fig. 1, I have provided a gas-deflecting partition, consisting of a series of baffle-plates *d d' d²*, &c., which are shown in detail in Figs. 4 and 5. These extend across the boiler among the tubes and are adapted to create a circuitous route for the gases, so that they remain longer in contact with the tubes and their heat is more efficiently extracted. Each plate has its edges notched to fit the tubes adjacent and is mounted on a pivot by which it may be turned, so as to deflect the gases from the most direct course or so as to leave the direct course unobstructed, as is shown by the dotted-line position in Fig. 5. The pivots *h* of these baffle-plates extend through the inclosing wall or plates of the boiler and are provided with handles H, by which they may be turned as desired. When turned into the horizontal position, as shown by dotted lines in Fig. 5, the baffle-plates may be drawn out or inserted by providing a proper opening at one side of the boiler. Said opening and the door for closing the same are shown in dotted lines in Fig. 3. The socket I for the reception of the pivot at the farther end of the plate may be coned or enlarged, as shown in Fig. 4, so as to facilitate insertion of said pivot when the plate is inserted. To permit withdrawal, the other end should have an adjustable support in a slot provided in the casing. Where space will permit, each baffle-plate may be made as a single piece, or if space at the side of the boiler is limited they may be made in short sections, which may be connected as inserted.

In Fig. 1 a single set of baffle-plates is shown, which are located above the bridge-wall at rear of furnace. Immediately back of the bridge-wall and on the opposite side of the passage J, through which the gases are conveyed to the uptake from that occupied by the chamber C', is a feed-drum D, to which the feed-pipe is connected. This feed-drum is connected with the chamber C' by a series of feed-heating pipes L' L² L³, and the feed-drum D and water-chamber C' have diaphragms P and P' within them and connecting the ends of different pipes, so that the feed-

water before being freely discharged into the chamber C' makes a circuit back and forth across the chamber J, and is thus heated by the escaping gases. Partitions also extend
 5 across the space between diaphragms P P' and the wall of the drums or chambers D and C', dividing this space into several sections, thus compelling the feed-water to travel an additional number of times between said drum
 10 and chamber. The two chambers C and C' are also directly connected by a pipe M, so as to equalize the supply to both ends of the boiler. A damper L is pivoted in the chamber J, so that the area of the connection with
 15 the uptake may be varied as desired. The uptake instead of being at the back of the boiler, as shown in Fig. 1, may be divided into two parts and placed at the side of the boiler. A ceiling K, of fire-brick or other refractory
 20 material, is preferably placed over the combustion-chamber or from chamber A to chamber A'. The two upper chambers A and A' act as steam-domes and may be connected by a steam-pipe, as S.
 25 In Fig. 3 two sets of baffle-plates are shown compelling the gases to go upward at one end of the tubes, downward at the middle, and then upward at the other end. In this case the ceiling K' is omitted at one end to make
 30 connection with the stack and a deflecting-partition K² placed over one end of the furnace upon or among the lower tubes. In Fig. 3 I have also shown an auxiliary air-supply introduced at N through the rear fur-
 35 nace-wall to more perfectly burn the gases.

It is evident that slight changes may be resorted to in the form and arrangement of the several parts without departing from the spirit and scope of my invention. Hence I do
 40 not wish to limit myself strictly to the structure set forth; but,

Having thus fully described my invention,

I claim as new and desire to secure by Letters Patent—

1. The combination with a water-tube boiler and the walls of the furnace structure, of a baffle-plate containing a longitudinal pivot-axis extending transversely of the tubes and having notches in its edges adapted to fit the boiler-tubes. 50

2. In combination with the water-tubes of a water-tube boiler and its furnace-walls, of a series of pivoted baffle-plates extending through the openings across the furnace between the water-tubes and provided with edge notches to receive said tubes; the water-tubes being so arranged as to leave clear openings extending transversely between them of greater horizontal than vertical extent whereby when in substantially vertical position said series of baffle-plates constitutes a deflecting-partition but when turned substantially horizontal they may be removed or inserted endwise into said openings. 60

3. The combination with the water-tubes and casing of a water-tube boiler, of baffle-plates interposed between the tubes and means for supporting and moving said baffle-plates whereby they may be moved from a position to form a series of open shutters to a position forming a substantially continuous partition; the said water-tubes being so arranged as to leave clear oblong openings through which said baffle-plates extend transversely; the major diameter of said oblong openings being greater than the width of said baffle-plates whereby said baffle-plates may, when in open position, be removed or inserted endwise into said openings. 70

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Witnesses:

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