

(No Model.)

4 Sheets—Sheet 1.

J. C. ANDERSON.
BRICK KILN.

No. 441,272.

Patented Nov. 25, 1890.

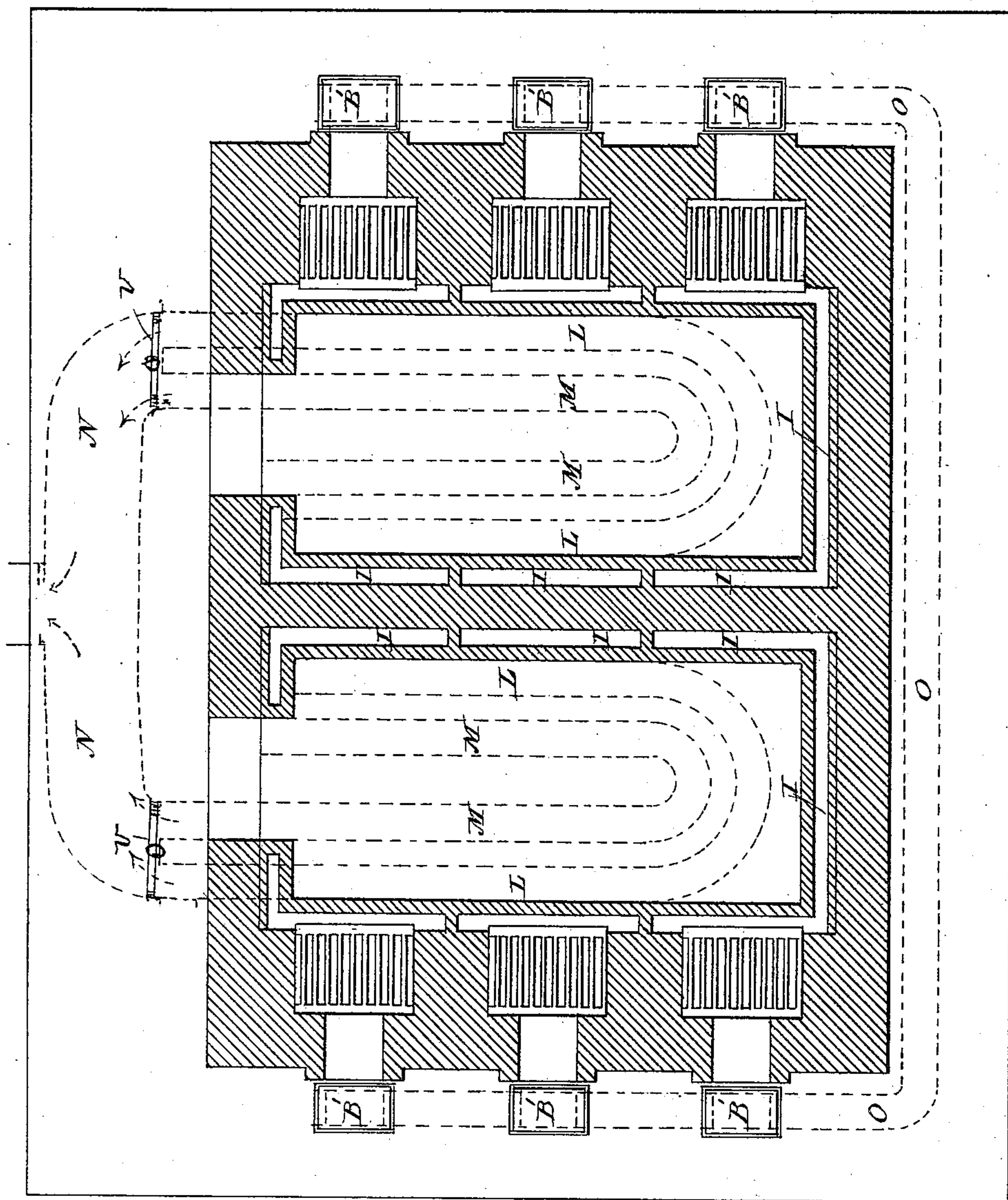


Fig. 1.

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Alex. Mahon

Inventor,

J. C. Anderson
By
S. M. Ginsbaugh
Attorney.

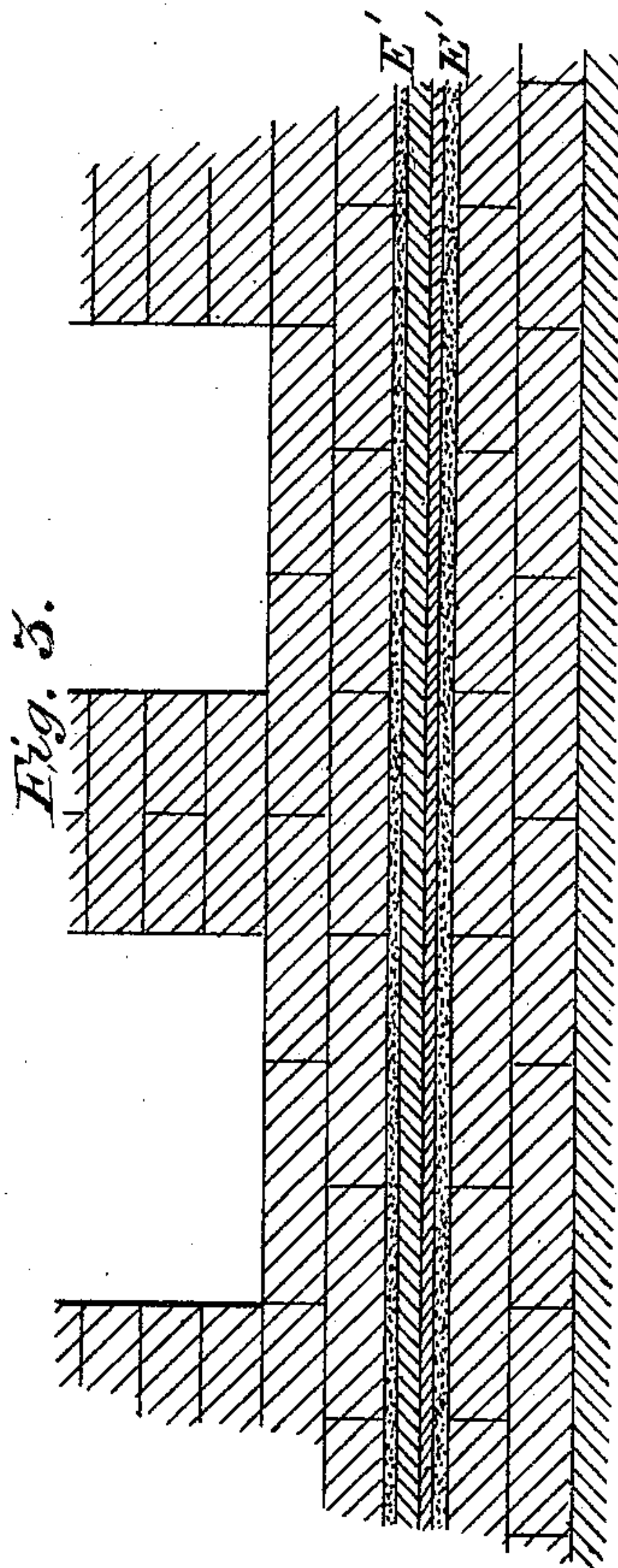
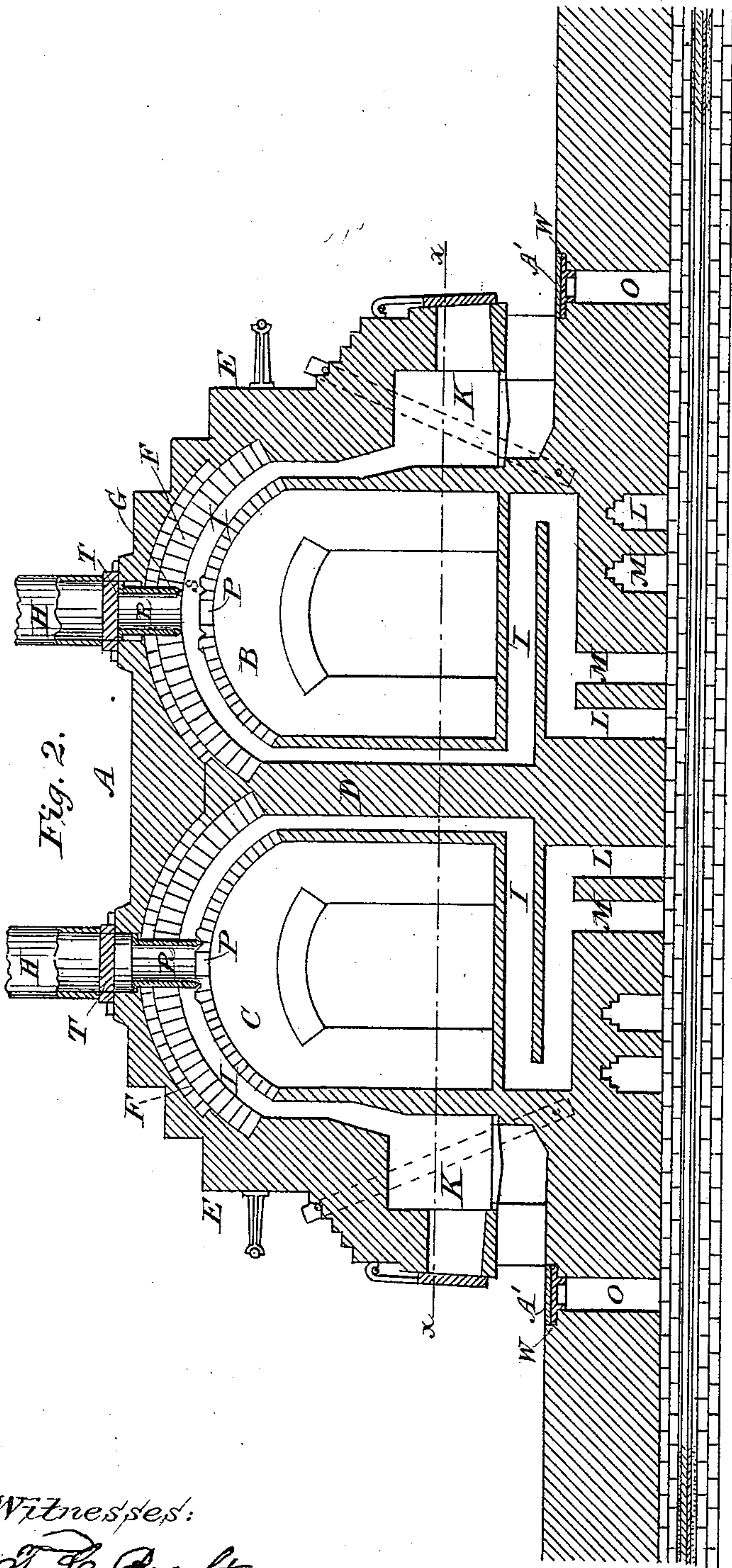
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4 Sheets—Sheet 3.

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Fig. 4.

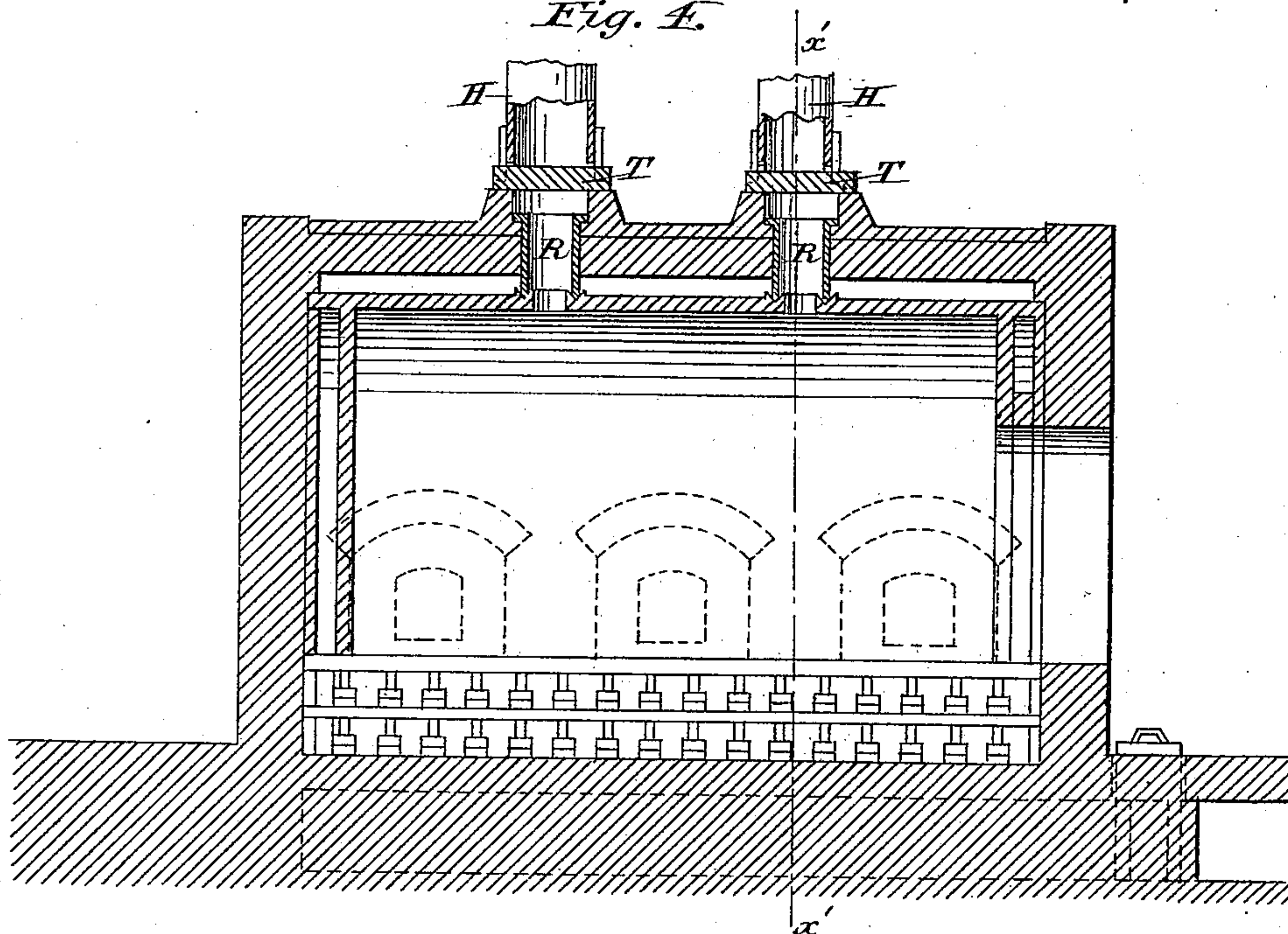


Fig. 5.

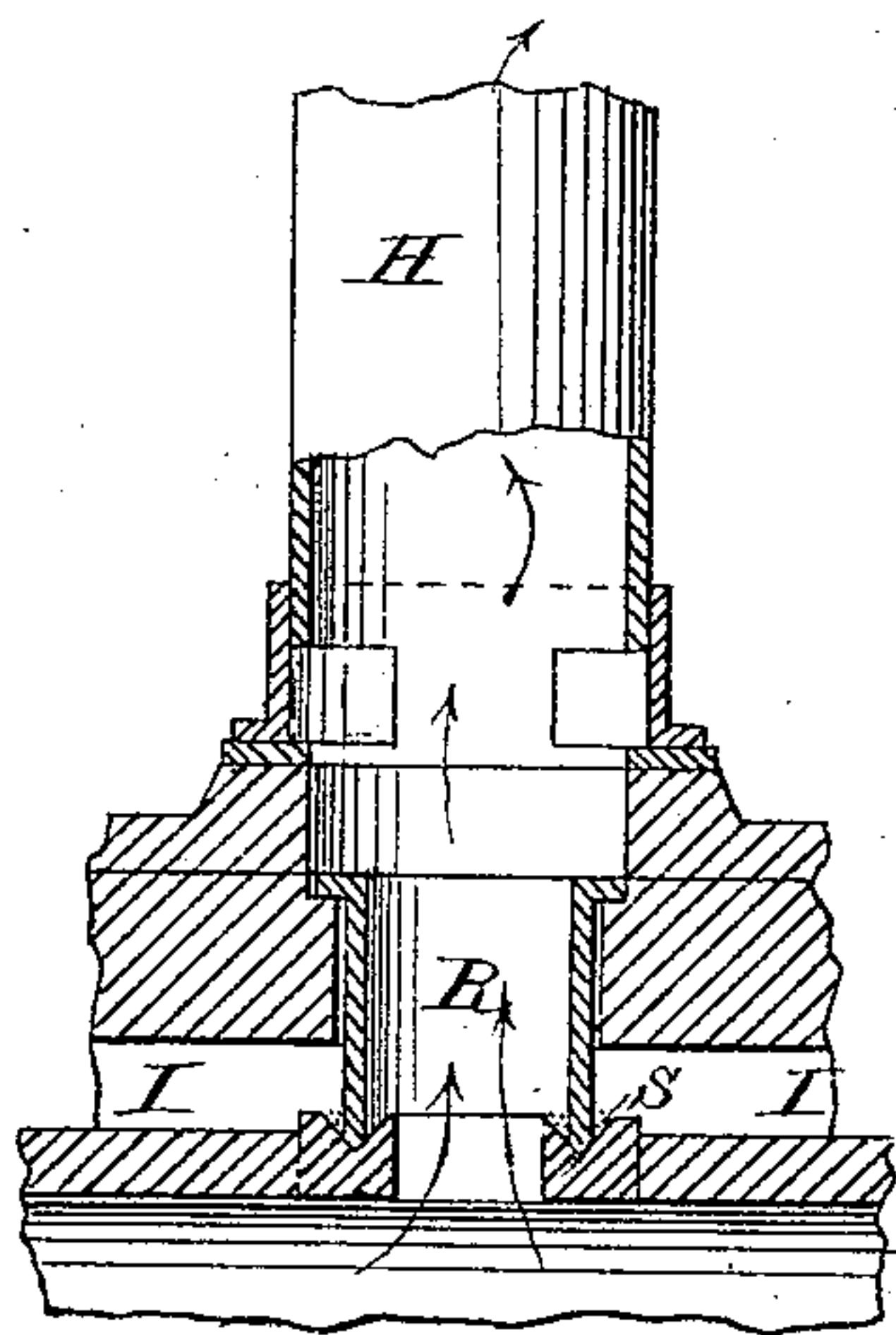
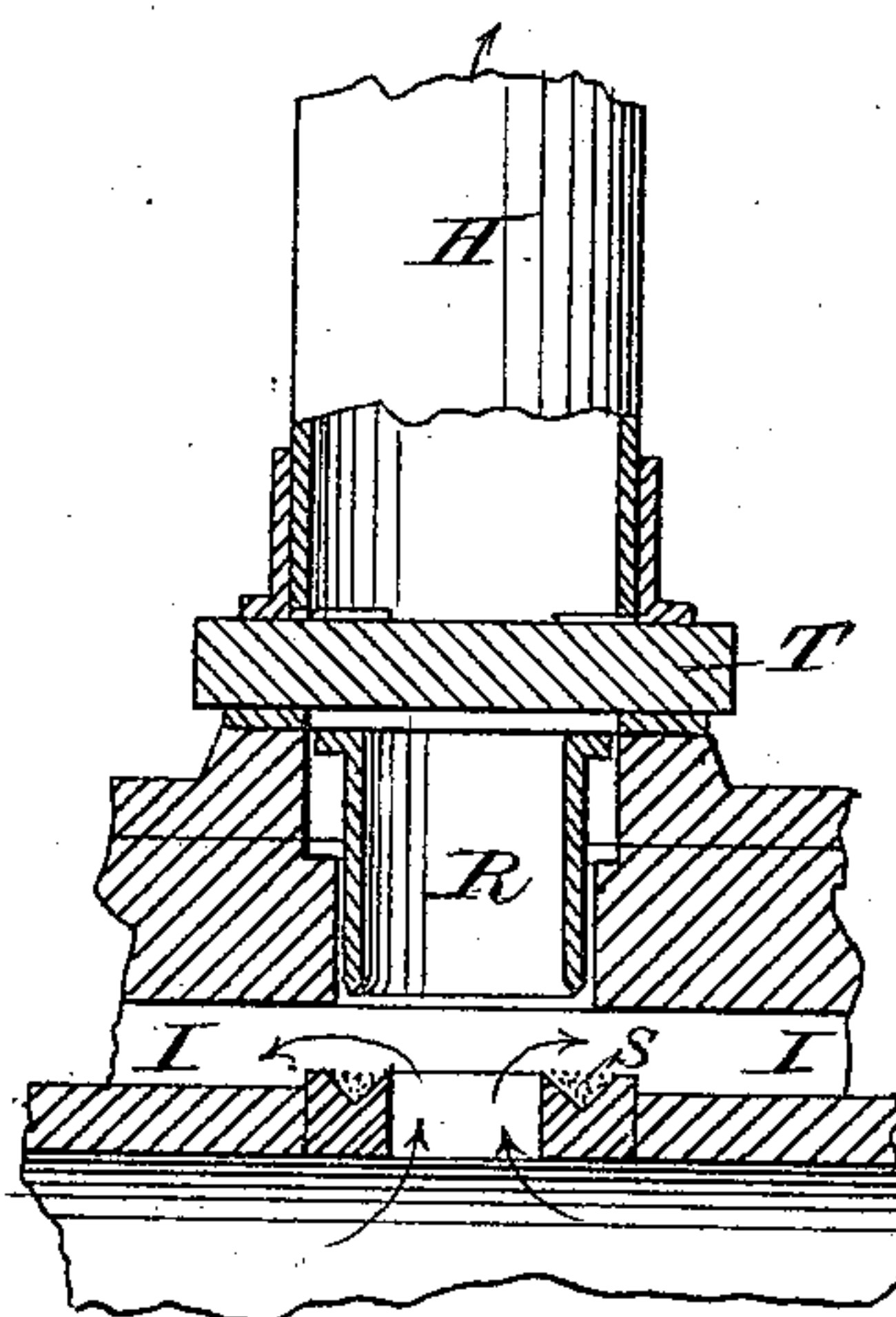


Fig. 6.



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Fig. 8.

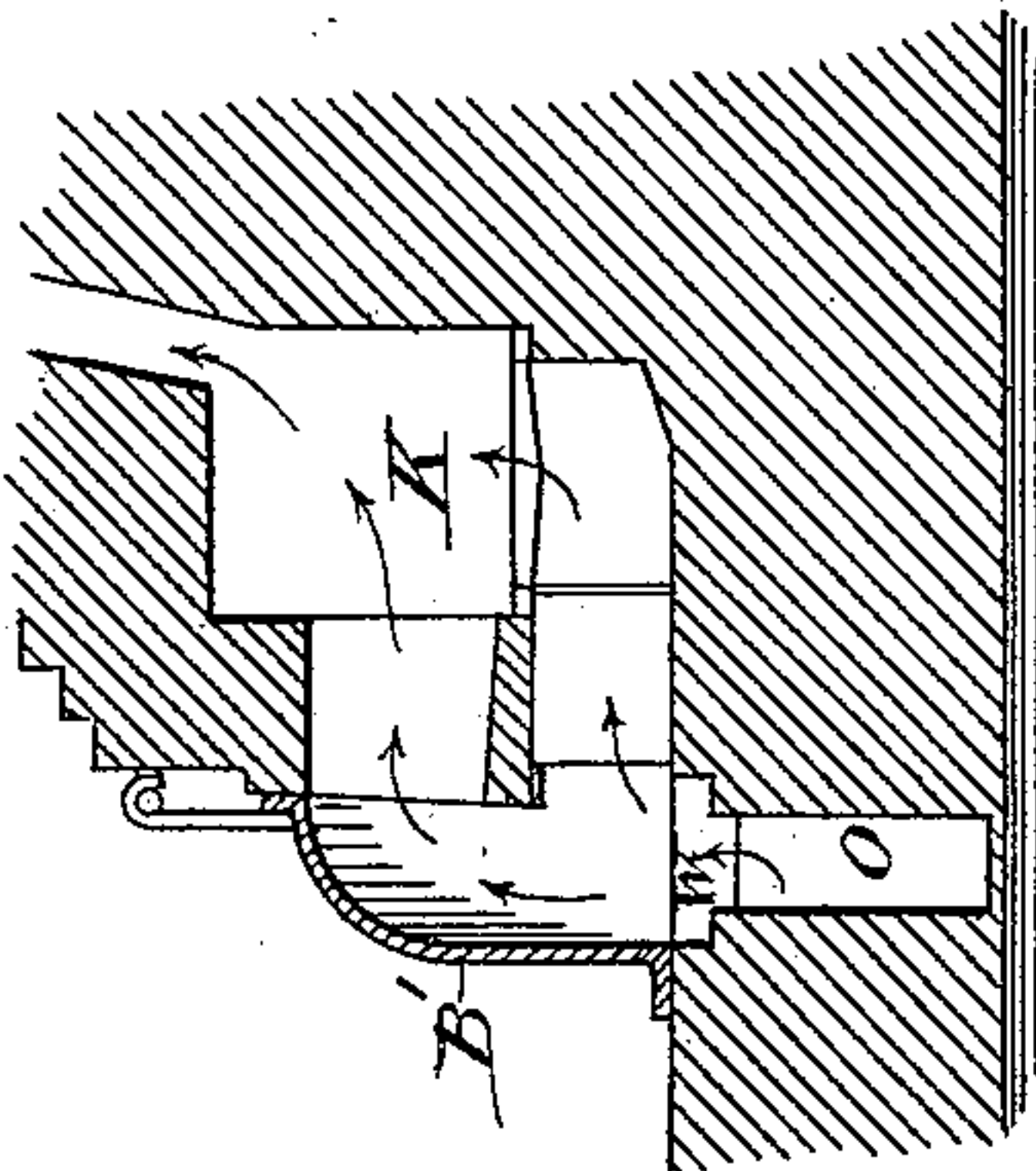


Fig. 10.

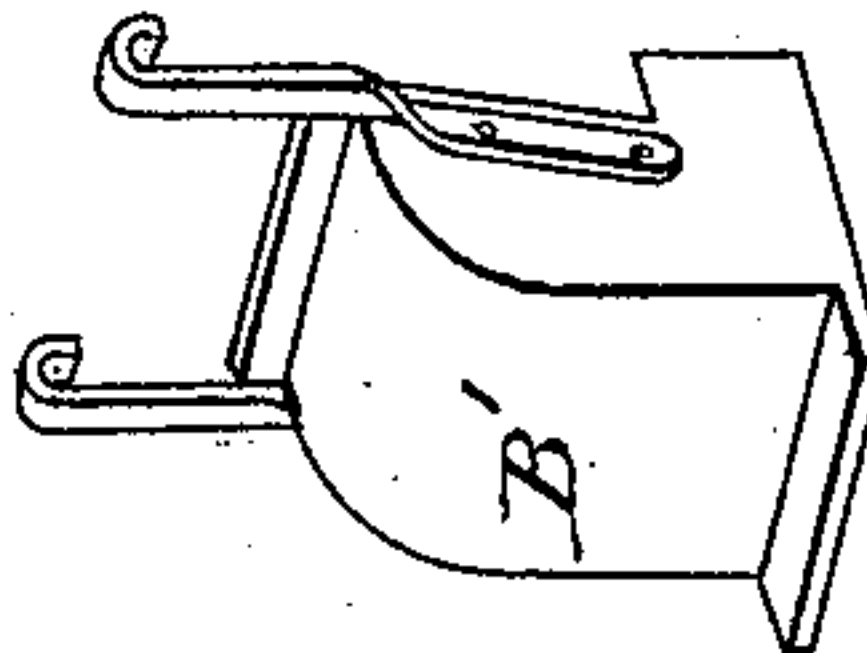


Fig. 7.

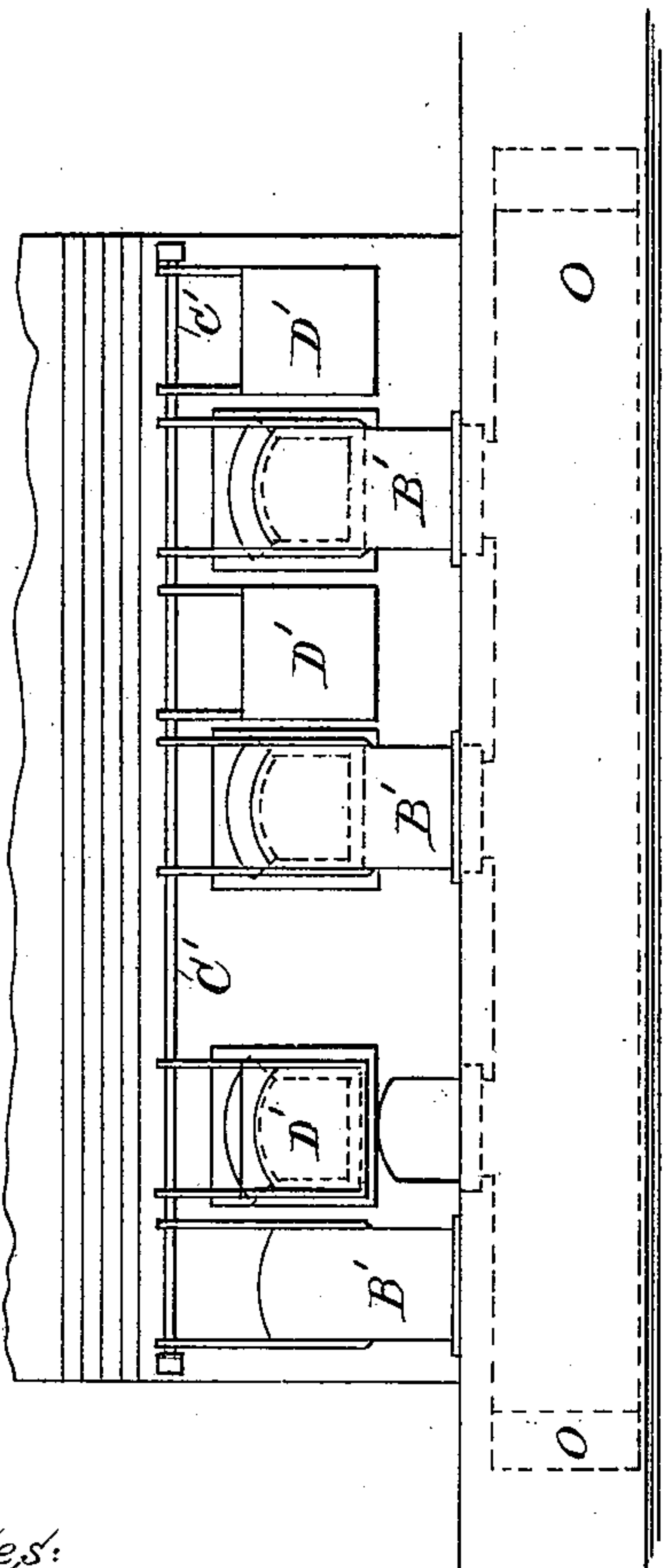
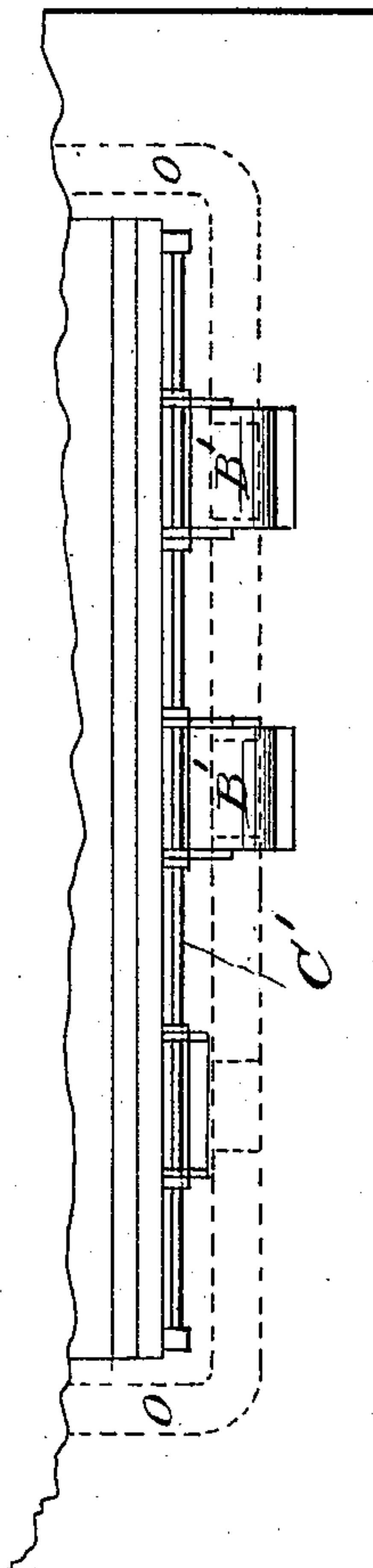


Fig. 9.



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UNITED STATES PATENT OFFICE.

JAMES C. ANDERSON, OF HIGHLAND PARK, ILLINOIS.

BRICK-KILN.

SPECIFICATION forming part of Letters Patent No. 441,272, dated November 25, 1890.

Application filed January 10, 1888. Serial No. 260,300. (No model.)

To all whom it may concern:

Be it known that I, JAMES C. ANDERSON, a citizen of the United States of America, residing at Highland Park, in the county of Lake and State of Illinois, have invented certain new and useful Improvements in Kilns for Burning Brick, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in kilns for burning brick and other similar articles made from clay.

The object of my invention is to utilize the waste heat which is thrown off in cooling a kiln or chamber of newly-burned brick for water-smoking, and drying the newly-made or green brick in another kiln or chamber adjacent thereto without bringing said heat into direct contact with the brick to be dried or water-smoked.

A further object of my invention is to prevent the water-smoke from backing into or entering the cell or kiln containing the hot or newly-burned brick.

A further object of my invention is to regulate the escape of the heat from the newly-burned brick, so that the green brick in the adjacent kiln will not be checked by overheating in the first stages of water-smoking.

A further object of my invention is to insulate the bottom of the kiln from the earth, so that the kiln will be kept free from moisture.

Referring to the drawings, Figure 1 is a top or plan view of my improved kiln, taken on the line xx of Fig. 2. Fig. 2 is a vertical sectional view taken on the line $x'x'$ of Fig. 4. Fig. 3 is a sectional view of a portion of the foundation of the kiln. Fig. 4 is a vertical longitudinal sectional view. Fig. 5 is a sectional view of the double walls of the arch of the kiln, showing the sleeve or tube in position for conveying the water-smoke to the external air. Fig. 6 is also a sectional view of the double walls of the arch of the kiln, showing the sleeve or tube raised, so as to allow the heat to pass into the flues or spaces between the outer wall and the lining of the kiln. Fig. 7 is a front view of the kiln. Fig. 8 is a sectional view of one of the furnaces of the kiln, showing the hood in position for de-

flecting or conveying the hot-air currents from the newly-burned brick in the adjacent kiln into the furnaces and space between the arches of the kiln. Fig. 9 is a top or plan view of a portion of the kiln, showing the hoods in position. Fig. 10 is a view in perspective of the hood for deflecting or conveying the hot air from the flues leading from the kiln to the furnaces.

A indicates the kiln, which is composed of two burning-chambers B and C, arranged side by side and separated from each other by a partition-wall D, the partition-wall D, in connection with the outer walls E, serving to support the outer arches F of the kiln, said arches being provided with a central opening G, which communicates with stacks H, through which the water-smoke is allowed to escape. The walls of the chambers or kilns B and C are made of fire-brick, and are separated from the outer walls E, so as to form spaces or flues I, which communicate with the furnaces K and extend entirely around the chambers or kilns and enter the open flues L and M, located beneath the floor of the kiln, said flues being curved and brought back to the other end of the kiln, where they enter the flues N and O, as will more fully appear. The inner arches of the chambers B and C are provided with openings P, which register with the openings G in the outer arches, a sleeve or fire-clay pipe R being arranged in the opening G, so as to fit in a groove S, formed around the opening P, said groove being filled with pulverized refractory material, which will make a tight joint around the sleeve when the same is lowered into the groove, as shown in Fig. 5. The stacks H are provided with dampers T, which are closed when the bricks are being burned.

The operation of this portion of the kiln is as follows: In the first stages of burning, and when it is desired to free the kiln of water-smoke, the dampers T are removed and the sleeves or pipes lowered so as to rest in the grooves S'. This allows the water-smoke to escape through the stack H to the external air. After the water-smoke has been driven off the damper is put in position to close the entrance to the stack and the burning of the brick is proceeded with. After the bricks

have been burned the sleeves or pipes are raised, as shown in Fig. 6, and the heat from the bricks allowed to escape by the way of the flues or spaces I to the flues L and M, and from thence through the flues N to the flue O of the adjacent kiln, where it is directed into the furnaces and spaces I by means of the hoods B', and around the arch of the adjacent kiln to heat the same and drive off the water-smoke from the newly-made brick piled therein. In order to prevent the checking of the green brick by reason of an excess of heat being applied to them during the first stages of water-smoking, the sleeves or thimbles R are raised only a short distance, and as the water-smoking process is continued the thimbles or sleeves are raised and the full volume of waste heat is allowed to pass through the chamber or space I.

In operating this system of kilns only one chamber is burned at a time; or, in other words, the chambers are filled with green brick and fired alternately—i. e., when one chamber is being fired the other chamber is being emptied of the burned brick and filled with the green brick. During the process of burning the brick the damper V in the flue N, leading from the kiln being burned to the stack, is opened, which allows the waste products of combustion to escape.

O are flues which extend around the sides and one end of kiln, said flues O being provided with openings W opposite each furnace, the openings being provided with doors A', which can be readily removed when desired.

B' are hoods adapted to slide on the bar C', which also supports the doors D' of the furnaces K. The hoods B' extend down to the openings in the flues O, so that after the kiln has been burned the hoods B' are moved over in front of the furnaces (the doors D' being moved to one side) and the doors or traps A' removed. This allows the heat escaping from the space I and from the interior of the kiln to return back through the furnaces into the flue O, and then around to the furnaces of the adjacent kiln, which has been filled with green brick, where it is directed into the furnaces by the hoods B' and around through the flue I to heat the lining of this kiln and water-smoke the brick. After the water-smoking operation has been completed the hoods are removed, the doors A' leading to the flue O are closed, and the firing of this chamber is proceeded with. The lower portion or foundation of the kilns is insulated from the ground by means of layers of any suitable fire and water proof material E', thus preventing the moisture from rising from the ground to the kiln, which often produces injurious effects and creates water-smoke in the first stages of firing the kiln. It will be noticed that the flues or chambers I extend entirely around the sides, top, and ends of the chambers B and C, and that the brick are

burned by the heat transmitted through the walls of the chambers and from brick to brick, so that the articles to be burned are kept free from the fumes of the products of combustion. It will also be noticed that the waste heat which escapes in cooling off the brick in one of the chambers is utilized in water-smoking the newly-made brick in the adjacent chamber without bringing said heat into direct contact with the brick; but is transmitted thereto through a separate housing or lining, and furthermore, that the water-smoke is carried directly out of the kiln into the external air and is prevented from backing into or entering the chamber containing the hot burned brick. In the latter case the hot brick would be damaged by being discolored and checked by contact with the water-smoke, and in the former case the green brick would be damaged by checking by reason of the heat coming too quickly in contact with the surface of the brick, which action is avoided by being warded off by the intervening jacket, the heat being slowly transmitted through said jacket to the kiln.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In kilns for burning brick, the flues or spaces I, extending from the furnaces around and beneath the chambers B and C, in combination with the flues L, M, and O and hoods B', whereby the waste heat from one chamber is brought around through the walls of the adjacent kiln, as set forth.

2. In kilns for burning brick of the character described, the arches of which are provided with a central opening and an adjustable pipe or sleeve adapted to connect the openings in the arches with the interior of the kiln and with a stack or flue, said stack being controlled by a suitable damper, whereby the water-smoke is carried away, as set forth.

3. In a double-walled kiln of the character described, the adjustable pipe or sleeve R, located in an opening in the outer arch or wall of the kiln and adapted to cover an opening in the inner arch or wall, whereby the water-smoke is permitted to escape and the heat from the burned brick in the interior of the adjacent chamber or kiln transferred to the space around the other kiln, as set forth.

4. In kilns for burning brick, the flues O, provided with the openings W, and doors A', with the hoods B', furnaces K, and flues or spaces I, as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

J. C. ANDERSON.

Witnesses:

S. W. SINSABAUGH,
ALEX. MAHON.