

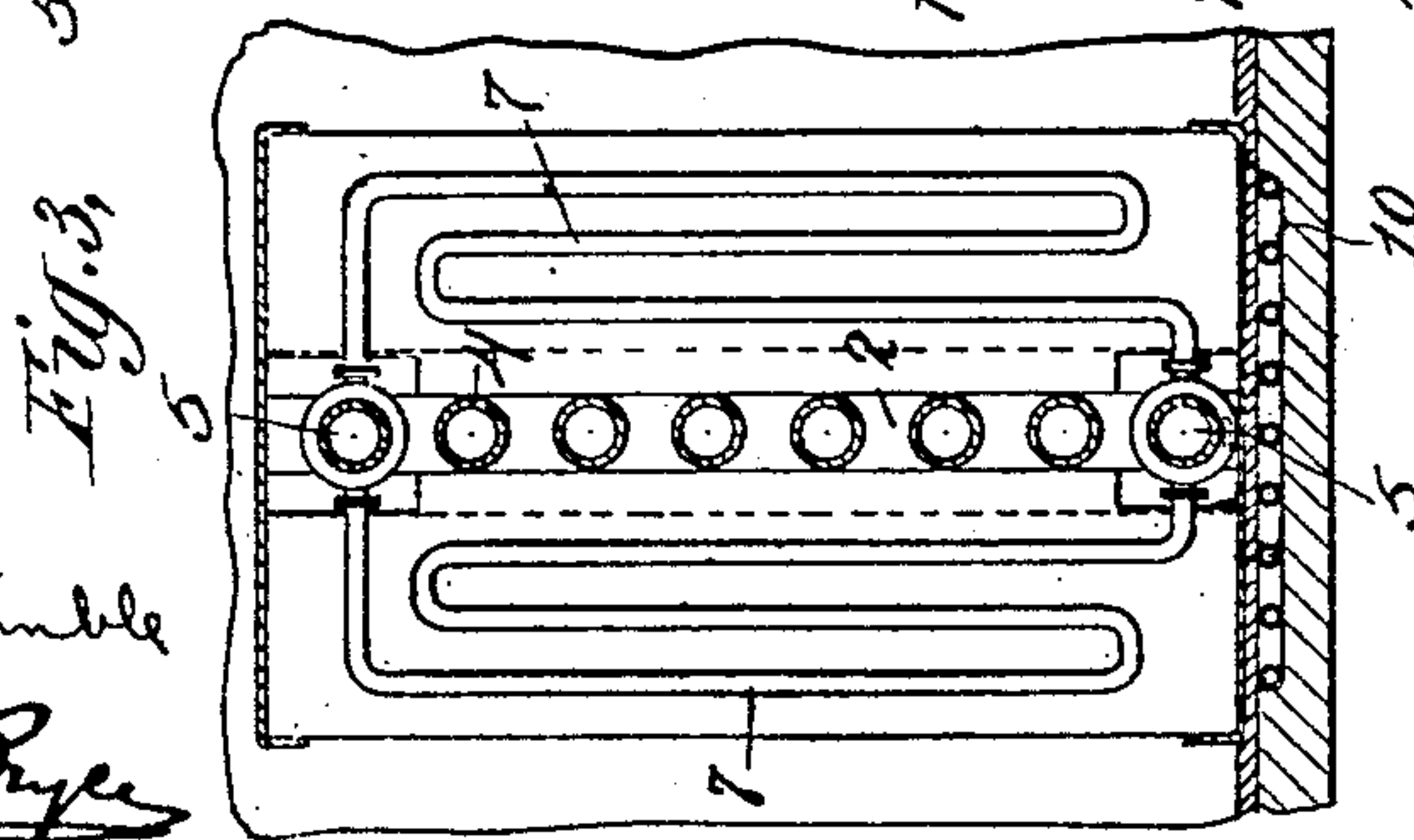
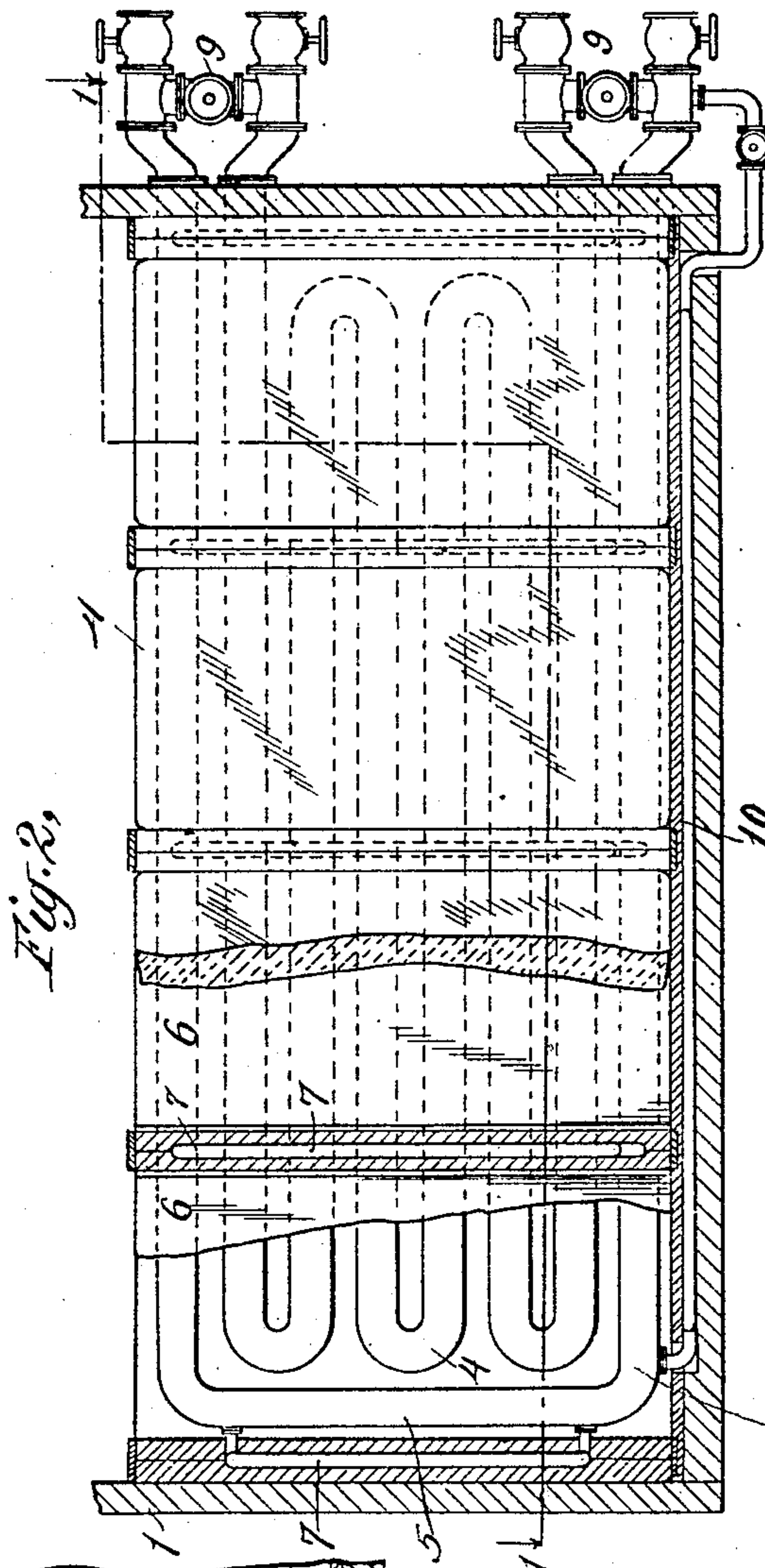
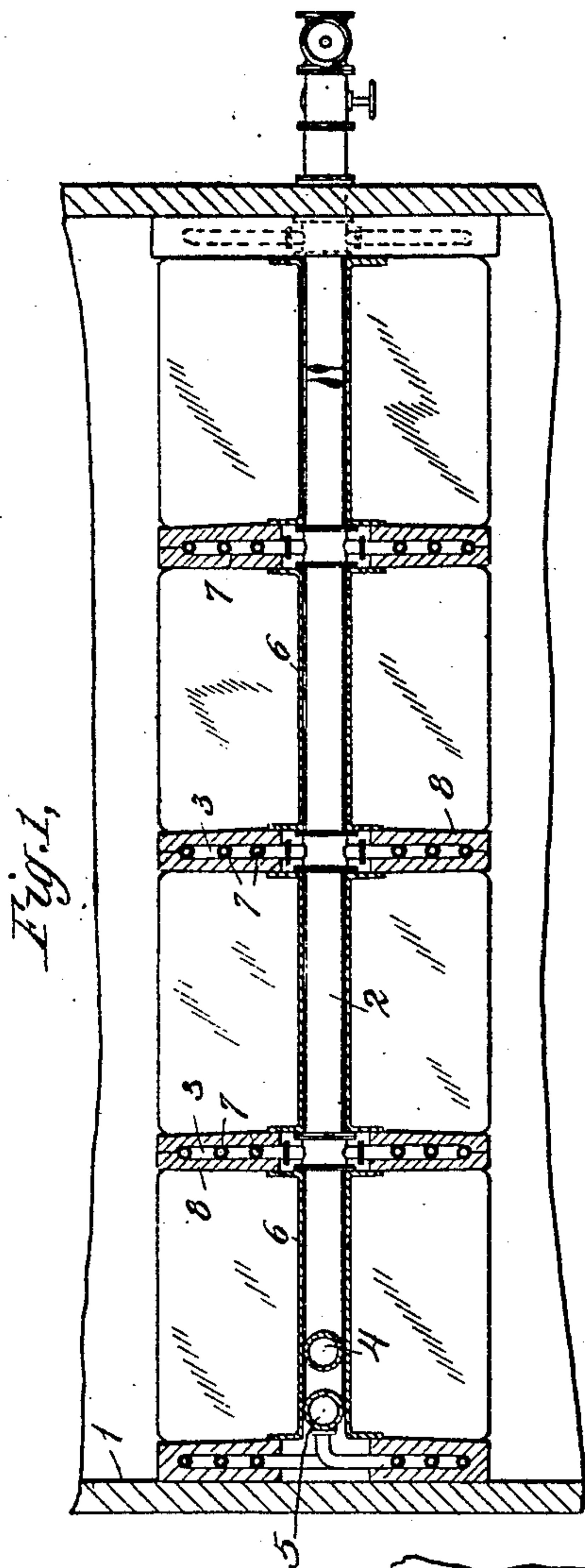
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DEPARTMENT OF COMMERCE

No. 847,737.

PATENTED MAR. 19, 1907.

B. F. DALY.
ICE MAKING APPARATUS.
APPLICATION FILED JAN. 23, 1906.



WITNESSES:
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UNITED STATES PATENT OFFICE.

BENJAMIN F. DALY, OF NEW YORK, N. Y.

ICE-MAKING APPARATUS.

No. 847,737.

Specification of Letters Patent.

Patented March 19, 1907.

Application filed January 23, 1906. Serial No. 297,408.

To all whom it may concern:

Be it known that I, BENJAMIN F. DALY, a citizen of the United States, residing in New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Ice-Making Apparatus, of which the following is a specification.

My invention relates to improvements in ice-making apparatus, and particularly to apparatus for making blocks of convenient size by what is known as the "plate" method.

My invention consists in the novel features hereinafter described, and particularly pointed out in the claims.

The superiority of "plate-ice" to "can-ice" is well recognized; but as heretofore practiced the making of plate-ice has had the serious disadvantage that the ice must be handled in very large sheets, requiring expensive machinery to handle the same and involving considerable expense and waste in the cutting up of the plates or sheets into blocks of salable size.

The objects of my invention are to overcome this objection and to provide means whereby a single freezing-plate may form any desired number of ice blocks of convenient size, such blocks being separate from each other, to provide convenient means for freeing such blocks from the plate, to make the blocks uniform in size, and to provide convenient means for regulating the freezing of the blocks.

I will now proceed to describe my invention with reference to the accompanying drawings, in which one embodiment of my invention is illustrated, and will then point out the novel features in claims.

In the said drawings, Figure 1 shows a top view of a freezing-plate in place within a tank, all but one of the arms of said tank being shown in section. Fig. 2 shows a side view and partial section of said plate in place within the tank, a portion of one of the ice cakes being broken away to show the side of the plate and a portion of the side of the plate being broken away to show the interior coils, one of the arms of said plate being also sectioned. Fig. 3 shows a transverse section through one of the arms of the plate.

In the said drawings, 1 designates the freezing-tank, 2 the freezing-plate, and 3 lateral arms or projections therefrom for separating the ice as it forms into blocks. The said freezing-plate in the construction shown comprises two pipe-coils 4 and 5, respec-

tively, the former arranged in vertical return-bends, these coils being inclosed within metallic sheathing-plates 6. The arms 3 comprise vertical return-bend coils 7, which in the construction shown are connected only to coil 5, said coils 7 inclosed by sheathings of non-conducting material 8—such as wood, for example.

In the normal operation of my device during the freezing of the ice cold brine or other suitable refrigerating agent is circulated through the coils 4. The tank 1 being filled with water, this causes ice to form against the sides of the freezing-plate 2 and between the arms 3, said arms therefore dividing up the ice as it forms into a series of separate blocks of convenient size. The blocks having been formed, I stop the flow of cooling fluid through coils 4 and circulate warm water or warm brine or steam or other suitable heating fluid through coils 5, and therefore through the coils 7 of the arms 3, thereby melting those surfaces of the ice-cakes which are in contact with the surfaces of the freezing-plate sufficiently to free said ice-cakes from the plate and permit them to be removed. The flow of the heating agent through the coils 5 and 7 is then stopped, the tank 1 is again filled, and the operation repeated. The function of the non-conducting material 8, which sheaths the coils 7 of arms 3, is this, but for said non-conducting material the ice would form more rapidly close to the arms 3 than elsewhere, and the ice cakes formed would not be regular and substantially rectangular in shape, but would be concave. I obviate this difficulty by so proportioning the thickness of non-conducting material on the arms 3 as substantially to neutralize this tendency to uneven freezing, and thereby I am enabled to obtain substantially rectangular blocks. Preferably, also, I provide valves 9 for connecting pipe-coils 4 and 5, so that when desired I may admit cooling fluid to coils 7 to accelerate the formation of ice along arms 3. By admitting such cooling fluid to coils 7 to accelerate the formation of ice or, if necessary, by admitting heating fluid to coils 7 momentarily during the freezing I may regulate as desired the formation of ice between the arms 3, thus insuring the formation of regular blocks.

As shown, the sheathing-plates 6 are angle-plates, and the sheathing-pieces 8 terminate just inside the webs of these plates, leaving a space for the flanges of the pipe-

joints by which the sections of pipes 4 and 5 are connected together and the coils 7 are connected to pipe 5.

10 designates melting-coils within the bottom of the tank, provided to free the ice from the tank-bottom.

What I claim is—

1. In ice-making apparatus, a freezing-plate of heat-conductive material and provided with cooling means, and dividing-arms of material conducting heat with difficulty projecting therefrom at intervals.

2. In ice-making apparatus, a chambered freezing-plate provided with heat-conducting walls, and dividing-arms of material conducting heat with difficulty projecting outwardly from sides of the plate provided with such heat-conducting walls.

3. In ice-making apparatus, a freezing-plate comprising a chamber having within it pipe-coils and means for circulating cooling and heating fluids therethrough, said plate having dividing-arms projecting from its sides and comprising pipe-coils and sheathings of non-conducting material.

4. In ice-making apparatus, a freezing-plate comprising a chamber having within it pipe-coils and means for transmitting cooling fluid therethrough, said plate having dividing-arms projecting from its sides and comprising pipe-coils, means for transmitting either cooling or heating fluid through said

latter coils at will and sheathings of non-conducting material for the coils of said arms.

5. In ice-making apparatus, a freezing-plate comprising a chamber having within it two pipe-coils and means for supplying heating fluid to one and cooling fluid to the other, said plate having dividing-arms projecting from its sides and comprising pipe-coils connected to one of the coils of said plate, and means for connecting the said coils of said plate, whereby either cooling or heating fluid may be passed through the coils of said arms at will.

6. In ice-making apparatus, a freezing-plate comprising main pipe-coils, plates forming the sides of said freezing-plate having flanges or webs, dividing-arms projecting from the sides of said plate and comprising pipe-coils and sheathing-pieces fitting between the flanges of said side plates, but leaving a space between said flanges, the main pipe-coils being formed in sections connected by joints located in said spaces, and the coils of said arms connected to main pipe-coils by joints located within said spaces.

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

BENJAMIN F. DALY.

Witnesses:

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