No. 705,015. Patented July 22, 1902.

E. BARRATH.

CONGEALING BODY OR PLATE FOR ICE MAKING MACHINES.

(Application filed Dec. 6, 1901.)

(No Model.)

Fig. 1.

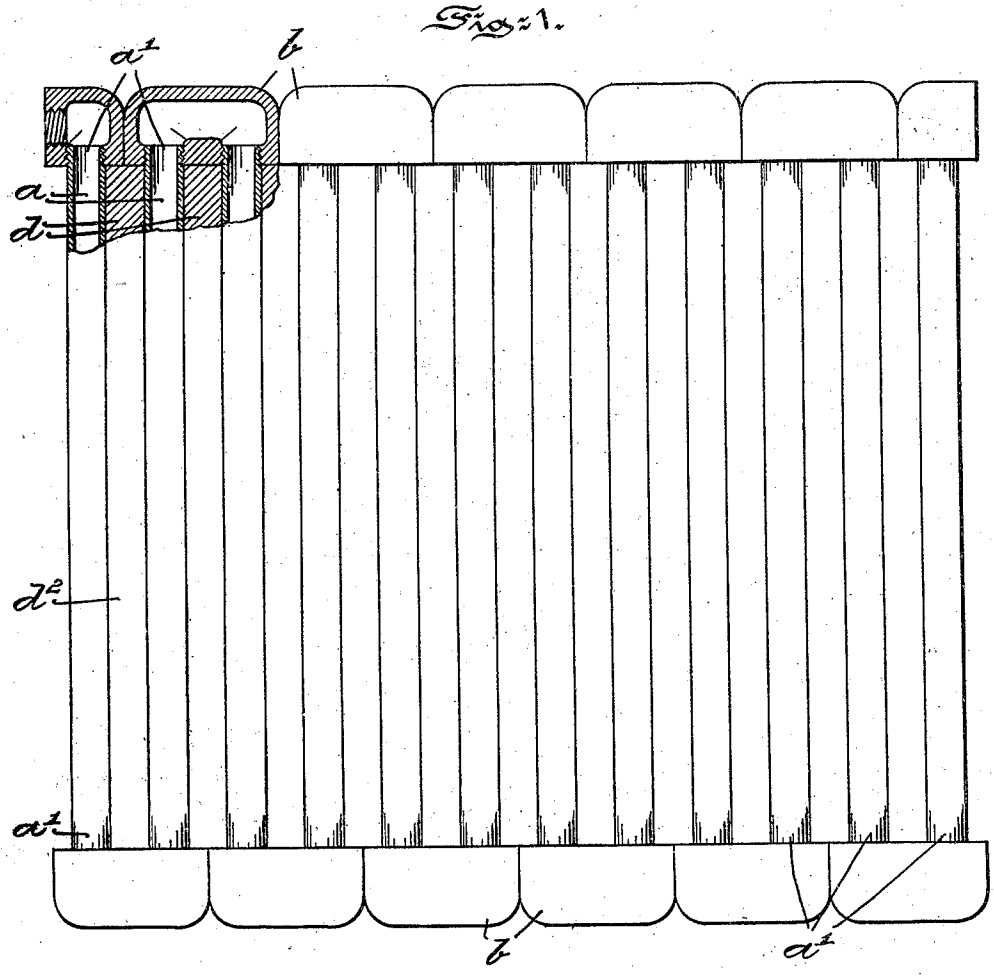


Fig. 2.

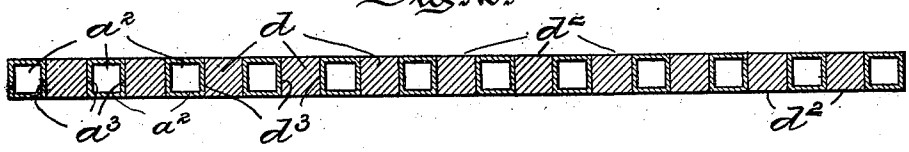


Fig. 3.

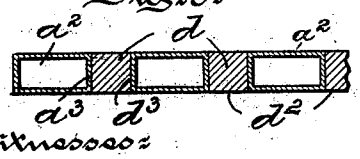


Fig. 4.

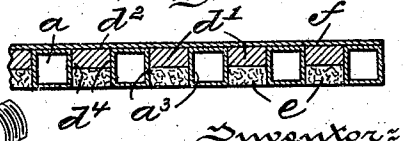
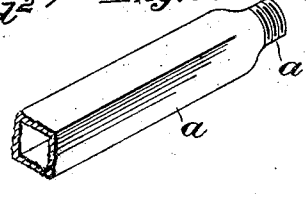


Fig. 5.



Witnesses:
Wilhelm Tost
Thomas M. Smith

Inventor:
Edward Barrath,
by J. Walter Douglas
Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EDWARD BARRATH, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF TWO-THIRDS TO JOHN J. KELLER AND AUGUSTUS BEITNEY, OF PHILADELPHIA, PENNSYLVANIA.

CONGEALING BODY OR PLATE FOR ICE-MAKING MACHINES.

SPECIFICATION forming part of Letters Patent No. 705,015, dated July 22, 1902.

Application filed December 6, 1901. Serial No. 84,864. (No model.)

To all whom it may concern:

Be it known that I, EDWARD BARRATH, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Congealing Bodies or Plates for Ice-Making Machines, of which the following is a specification.

My invention has relation to a congealing body or plate for use in the manufacture of artificial ice; and in such connection it has relation to the construction and arrangement of such a body or plate.

The freezing-plates now in general use are built up of coils of pipe, through which the expanding refrigerant, usually ammonia, is forced. The pipes are generally round and extend parallel across the plate or body and are connected at the ends by return-bends. A plate or platform usually covers one or both faces of the coils to form a substantially flat body or plate. The principal objection to the use of such a body is that a small surface or point of contact is obtained between the incasing-platform and the periphery of the pipes, and the space between the pipes and platforms being filled with air a good conduction of heat is practically impossible, since air is an insulator and a bad conductor of heat. To obviate this latter difficulty, attempts have been made to fill in the air-spaces with liquids and even with metals which were molten and poured into the air-spaces to unite the pipes into a rigid body or plate. Where liquids were used, the conductivity was less than could be obtained by metal, whereas when metal was used the expansion and contraction of the pipes or coils under the excessive changes in temperature served to warp the body or plate and frequently broke or ruptured the pipes or coils.

The principal object of my present invention is to build up a plate or body wherein the pipes are separated from each other by metallic strips or bars, the adjacent sides of the pipes and metallic bars abutting and lying in parallel and flat planes and the exposed surface or surfaces of the pipes and metallic bars upon which the ice is to be formed lying in alinement in one plane.

The nature and scope of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a front elevational view of a congealing plate or body embodying main features of my invention, one corner of said plate or body being sectioned to illustrate the interior construction of the same. Fig. 2 is a central cross-sectional view of Fig. 1. Figs. 3 and 4 are views similar to Fig. 2, but illustrating modified forms of the plate or body; and Fig. 5 is a perspective view of the rounded end of one of the pipes forming a part of the plate.

Referring to the drawings, a represents the ammonia or refrigerating pipes which preferably, as shown in the drawings, are square, rectangular, or parallelogrammatic in cross-section intermediate of their ends a'. The ends a' are reduced to cylindrical or rounded form to enter the return-bends b or similar connections necessary to connect the separate pipes a into one coil, through which the refrigerant may circulate. Intermediate of the pipes a are arranged metallic strips or bars d, which, as shown in Figs. 1, 2, and 3, are square in cross-section, whereas in Fig. 4 the bars d', which correspond to the bars d, are rectangular in cross-section. The pipes a have an upper and a lower flat face a^2 and flat sides a^3. The metallic bars d of Figs. 1, 2, and 3 have flat upper and lower faces d^2, respectively, in alinement with the flat faces a^2 of the pipes a. The bars d also have flat sides d^3 abutting against and parallel throughout their length with the flat sides a^3 of the pipes a. In the form of plate illustrated in Figs. 1, 2, and 3 the ice may be formed upon both faces of the plate. In Fig. 4, however, the ice is supposed to be formed upon the upper face of the plate, and for this reason the bars d' are substantially but half the depth of the pipes a, although the entire surface of their flat sides d^4 abut and lie parallel with the sides of said pipes. The lower

face of the plate shown in Fig. 4 is formed of alternate pipes *a* and insulating material *e*, which serves to confine the cold to the front or upper face of the plate. In this form it is preferable to cover the upper or front face of both pipes *a* and bars *d'* with a platform *f*, although in the other forms shown this platform is not deemed necessary. By arranging the bars *d* and *d'* as described the heat conducted through the sides a^3 of the pipes *a* is conducted from either the upper or from both surfaces of the plate by the interposed bars *d* or *d'*.

It is not necessary that the pipes *a* and bars *d* or *d'* be rectangular or square, since they may be rhomboidal or any equivalent shape in which the abutting faces of the pipes and bars in parallel planes and the freezing-surfaces of the pipes and bars are in alinement.

Having thus described the nature and scope of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A freezing plate or body, comprising a series of pipes of parallelogrammatic cross-section intermediate of their ends, said ends being rounded, a series of return-bends connecting the rounded ends of said pipes to form with the pipes a continuous coil for the passage of the freezing medium, and a series of solid metallic bars arranged between and separating adjacent pipes in the series of pipes, said bars being of a width corresponding to the depth of the parallelogrammatic pipes and having sides parallel to and abutting against the sides of the adjacent pipes and the freezing-surface of said bars being arranged in the plane of the freezing-surface of the pipes, substantially as and for the purposes described.

2. A freezing plate or body, comprising a series of pipes connected at their ends to form a coil, a series of metallic bars and insulating material interposed between the pipes, said pipes and bars having exposed freezing-faces in alinement, and the sides of the pipes abutting against and lying in planes parallel to the sides of the interposed bars and insulating material, the area of the freezing-face of the bar being coequal with the combined area of one side of the bar and of the side of the insulating material abutting against one side of an adjacent pipe.

In testimony whereof I have hereunto set may signature in the presence of two subscribing witnesses.

EDWARD BARRATH.

Witnesses:
J. WALTER DOUGLASS,
THOMAS M. SMITH.