J. E. GLOEKLER.

AIR COOLING APPARATUS.

APPLICATION FILED AUG. 20, 1908.

928,959. Patented July 27, 1909.

Fig. 1.

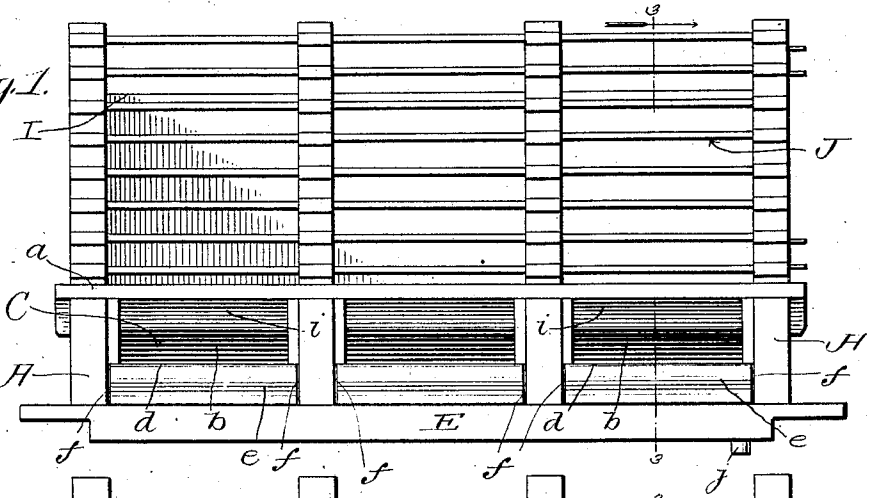

Fig. 2.

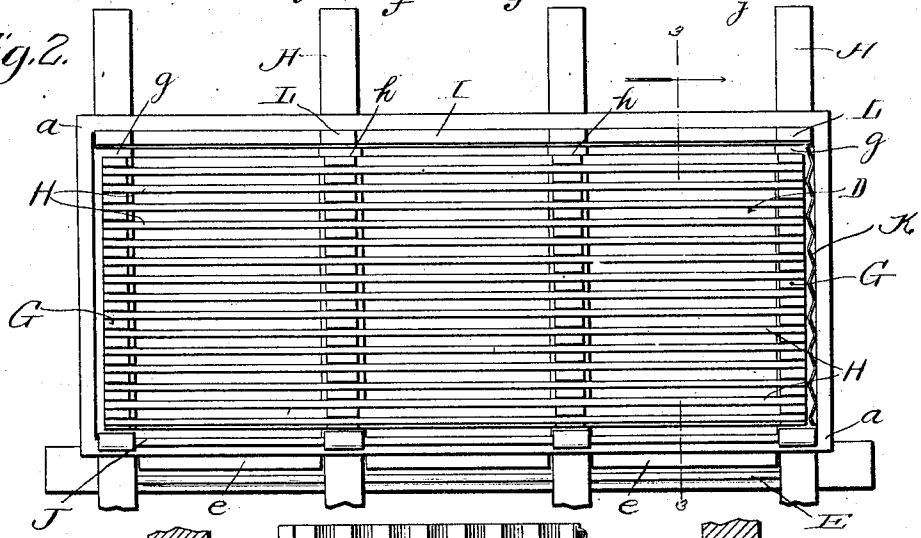

Fig. 3.

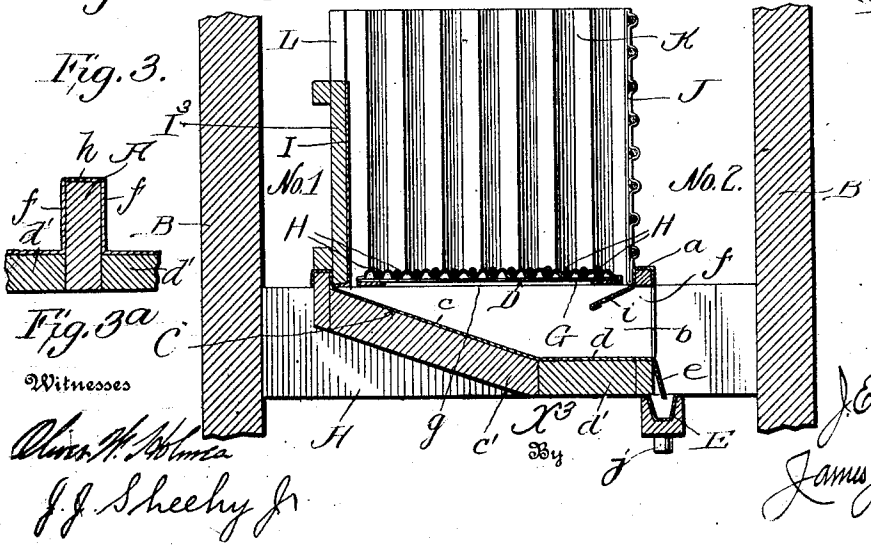

Fig. 3a

Witnesses

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AIR-COOLING APPARATUS.

No. 928,959. Specification of Letters Patent. Patented July 27, 1909.

Application filed August 20, 1908. Serial No. 449,455.

To all whom it may concern:

Be it known that I, JOHN EDWARD GLOEKLER, citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Air-Cooling Apparatus, of which the following is a specification.

My invention pertains to air cooling apparatus for use in refrigerators, cold storage apartments and the like; and it contemplates the provision of a simple and durable air cooling apparatus, constructed with a view of being easily kept in a sanitary condition, of maintaining an adequate circulation of air in proximity to the cooling means employed, and of preventing the dissipation of cold except to the current of air while the same is *en route* to the chamber in which products to be preserved are stored.

With the foregoing in view the invention will be fully understood from the following description and claims when the same are read in connection with the drawings, accompanying and forming part of this specification, in which:

Figure 1 is a side elevation of the air cooling apparatus constituting the best practical embodiment of my invention of which I am aware. Fig. 2 is a plan view of the same. Fig. 3 is a transverse section taken through my novel apparatus in the plane indicated by the line 3—3 of Figs. 1 and 2, and illustrating the apparatus as properly positioned in the casing of a refrigerator or the like. Fig. 3ª is a detail section showing the arrangement of the metallic portions *h* of the conduit walls on the intermediate timbers A.

Referring by letter to the said drawings: A A are timbers adapted to be fixed transversely in a refrigerator casing between opposite walls B of the casing, as shown in Fig. 3. The said timbers A are separated by intervening spaces, Fig. 1, and arranged on and connected to the timbers is a pan C which is formed entirely of suitable metal, this in order to take advantage of the good heat-conductor quality of metal to cool air incidental to the passage of the same through the pan. As clearly shown, the pan C comprises a rectangular frame *a*, disposed above the timbers A, and conduits *b* arranged intermediate of the timbers A and fixed with respect to the said timbers and also with respect to the before mentioned open, rectangular frame *a*. Any desired number of conduits *b* may be employed in the apparatus, and by reference to Fig. 3 it will be noted that each conduit has an inclined bottom portion *c* which extends downwardly from one side bar of the frame *a* and in the direction of the width of the apparatus, and also has an approximately horizontal bottom portion *d* which extends from the lower end of the inclined bottom portion and terminates in a depending flange or skirt *e*. It will also be noticed by reference to the drawings that the conduits *b* have side walls *f*, and that the outer side walls of the end conduits have flanges *g* which rest on and cover the end timbers A, while the other side walls of the conduits are connected by horizontal metallic portions *h* which rest on and cover the intermediate timbers A, Fig. 3ª. It will be further noticed by reference to the drawings, and particularly to Fig. 3 thereof, that the side bar of the frame *a* above the bottom portions *d* of the conduits *b* is provided with downwardly and inwardly inclined flanges *i*.

On the horizontal portions *g* and *h* of the pan C is arranged and permanently secured a frame D, of metal, which has for its office to support the means employed to cool air incidental to the passage of the latter through the apparatus; and at this point I would have it understood that the scheme of my invention contemplates cooling the air which rises at the side No. 1 in Fig. 3, and then permitting the cold and heavy air to descend through the frame D and the conduits *b* and to pass back to the storage chamber through the spaces at the side No. 2 of the apparatus. Ice is employed as the agent for cooling the air incidental to its passage through my novel apparatus in the manner described, and I make the conduits *b* serve the additional function of carrying the water from the melting ice to a trough E which is arranged to receive water from the flanges or skirts *e* and is provided with a conduit *j*, designed to carry such water outside of the refrigerator or the like.

In taking the course described through my novel apparatus it will be noted that the air comes into direct contact with the metal of which the pan C is formed, and by virtue of the metal being a good conductor of heat it will be manifest that the air will be quickly cooled. It will also be noted by reference to Fig. 3 that the under sides of the bottom portions *d* and *c*, of the conduits *b* are covered and insulated by horizontal strips *d'*,

of wood, and inclined strips c' also of wood, this being advantageous inasmuch as it prevents cooling of the air as the latter ascends against the cooling apparatus; and it will further be noted in this connection that the inclination of the bottom portions c of the conduits and the corresponding inclination of the non-conducting strips c' serves to guide or deflect the rising warm air to the side No. 1 of the apparatus, and in that way contributes to the maintenance of an adequate circulation of air through the apparatus.

For the purpose of properly holding ice I provide the frame D with longitudinally disposed seats G arranged side by side, as best illustrated in Figs. 2 and 3, and I also provide longitudinal ice-supporting bars H which are arranged in and are adapted to be removed one by one from the said seats G. Thus it will be understood that when it is desired to clean the apparatus, each of the bars H may be removed independently of the others and after being cleaned may be quickly and easily replaced in position on the frame D; and it will also be understood that when all of the bars H are removed, ready access may be gained to all parts of the pan C and frame D to facilitate the thorough cleaning thereof. The bars H are of circular form in cross-section, and from this it follows that the liability of sediment adhering to the bars is reduced to a minimum; also, that the bars when removed from the apparatus are adapted to be thoroughly cleaned in an expeditious manner.

The grating formed by the frame D and the bars H serves in combination with an imperforate side wall I, an open work side wall J and an imperforate back wall K, all of metal, to form an ice receptacle. The wall I is provided with an insulating backing I^3, of wood or other suitable material, and by reference to Figs. 1 to 3, it will be seen that the said wall I which is arranged at the side No. 1 of the apparatus is provided in its upper portion with openings L for the passage of warm air into the ice receptacle. It will also be seen that because of the open work character of the wall J, the air is free, after passing through the ice, to take passage through the said wall J precedent to descending at the side No. 2 of the apparatus.

My improvements are arranged in a refrigerator casing between opposite walls B thereof and between the closed top of the casing and a provision chamber indicated by X^3 in Fig. 3. From this it follows that air will rise from the provision chamber X^3 at the side No. 1 of the apparatus, and then after descending through the openwork frame to the conduits b or else passing through the openwork side walls of the apparatus, will descend in a cooled state at the side No. 2 of the apparatus and pass back to the provision or storage chamber X^3.

I have entered into a detailed description of the construction and relative arrangement of the parts comprised in the illustrated embodiments of my invention in order to impart a full, clear and exact understanding of the same. I do not desire, however, to be understood as confining myself to the said specific construction and relative arrangement of parts, inasmuch as in the future practice of my invention such changes or modifications may be made as fairly fall within the scope of the invention as defined in the claims appended.

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

1. The combination with spaced walls, of an air cooling apparatus arranged to afford vertical passages for air between its opposite sides and the said walls, and comprising a plurality of spaced supporting timbers extending between the walls, a pan supported on said timbers and having, in the spaces intermediate the timbers, transverse conduits, open at one side of the pan; the bottoms of the said conduits being inclined downwardly from the opposite side of the pan, and the said bottoms being insulated at their under sides, and being each provided, at the open end of its respective conduit, with a depending flange, a trough disposed below and at right angles to the timbers and positioned to receive water from the depending flanges of the conduits, a grating supported on the pan and adapted to support ice, and an imperforate side wall, an imperforate rear wall, and an open-work side wall, supported on the pan and serving in conjunction with the grate to form an ice receptacle, the said open-work side wall being arranged adjacent the trough.

2. A grating for the purpose described, comprising end strips having longitudinally disposed seats, of semicircular form in cross-section, at intervals in their length, and longitudinal, metallic bars, of circular form in cross-section, arranged in said seats and removable individually from the same, and means for supporting the said strips.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN EDWARD GLOEKLER.

Witnesses:
O. BRASHEAR,
ALBEI GLOEKLER.