Patented May 1, 1900.

No. 648,823.

E. J. WIRFS.

REFRIGERATOR.

(Application filed Aug. 14, 1899.)

(No Model.)

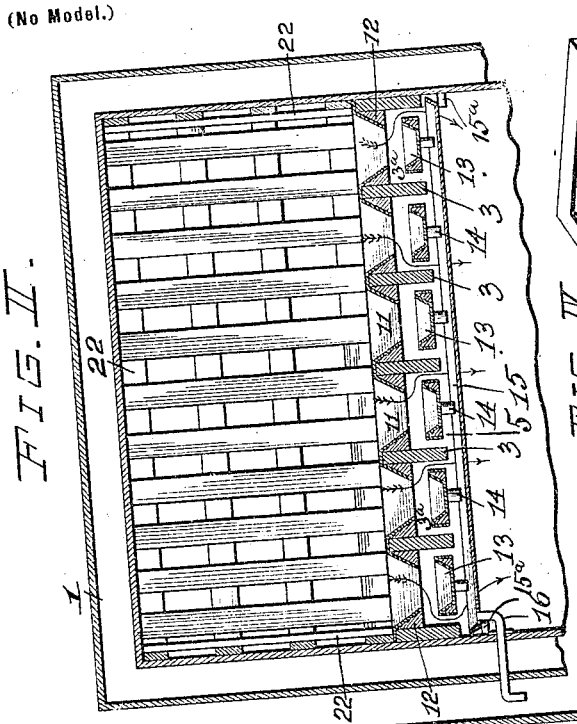

FIG. II.

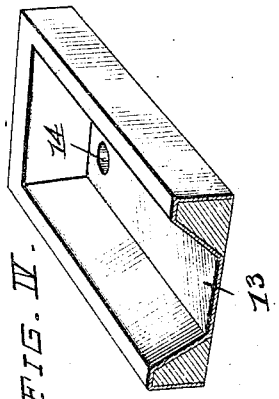

FIG. III.

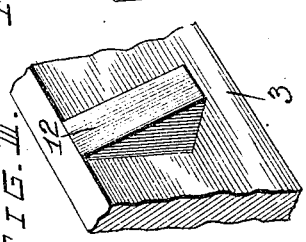

FIG. IV.

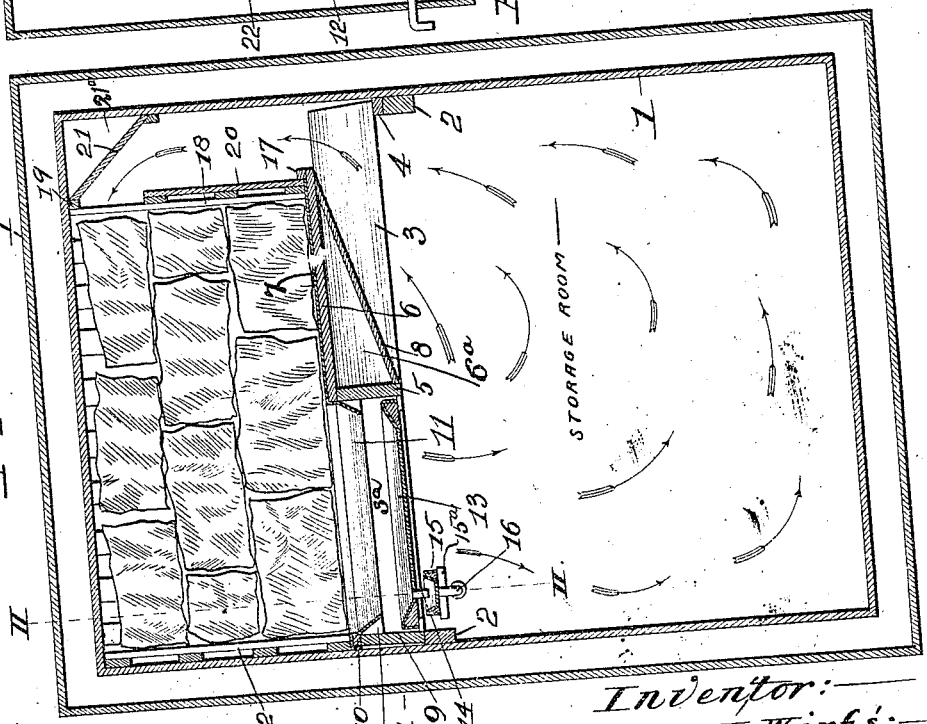

FIG. I.

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UNITED STATES PATENT OFFICE.

EDWARD J. WIRFS, OF ST. LOUIS, MISSOURI.

REFRIGERATOR.

SPECIFICATION forming part of Letters Patent No. 648,823, dated May 1, 1900.

Application filed August 14, 1899. Serial No. 727,160. (No model.)

To all whom it may concern:

Be it known that I, EDWARD J. WIRFS, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Refrigerators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

My invention relates particularly to large permanent refrigerators of the class usually employed for cold-storage purposes.

The objects of my invention are to arrange an ice-receptacle in the refrigerator in such a position that the warmer air, in rising in the structure, will pass around the ice within said receptacle and be cooled by coming in contact with said ice, to do away with and remove all odors arising from the goods placed in the storage-room, and, further, to arrange drip-plates, drain-pans, and a trough for carrying off the melted ice.

To the above purposes my invention consists in certain novel features of construction and arrangement of parts hereinafter specified and claimed.

Figure I is a vertical sectional view taken approximately through the center of a refrigerator of my improved construction. Fig. II is a vertical sectional view taken approximately on the indicated line II II of Fig. I. Fig. III is a detail perspective view of one of a series of triangular blocks to which is secured the drip-plates below the ice-receptacle. Fig. IV is a detail perspective view of a section of one of the drain-pans made use of in carrying out my invention.

Referring by numerals to the accompanying drawings, 1 indicates a structure having double walls, and fixed to the inside faces of the front and rear inner walls at points slightly above the center in the height of the structure are the transversely-arranged timbers 2, the same being for the purpose of sustaining the longitudinally-extending timbers or joists 3. These joists 3 are arranged at equal distances apart, and all of said joists are slightly inclined, owing to the elevation of their rear ends, which is accomplished by locating a strip 4 on top of the timber 2 that is fixed to the rear wall.

Held between the joists 3 at points approximately midway between their ends are the vertically-arranged blocks 5, and laid upon the joists 3 and extending from said blocks 5 to a line adjacent the rear ends of said joists is a flooring 6, the same being overlaid with suitable sheet-metal covering 7. Inclined pieces 8 extend from the lower ends of the blocks 5 to the rear ends of the flooring 6, thus inclosing the dead-air space 6^a in the corners formed by the meeting of the forward end of the flooring 6 and the upper ends of the blocks 5. The dead-air space inclosed by the inclined pieces 8, the blocks 5, and the flooring 6 serves as a protection for the ice resting upon the flooring 6 to prevent the warm air from the storage room or chamber coming in direct contact with said flooring, and thereby causing the ice resting upon the flooring to melt rapidly, while the inclined pieces 8 serve to direct the warm air upwardly to circulate into the ice-chamber. The forward ends of the joists 3 are united by the blocks 9, similar to the blocks 5, and strips 10 are positioned upon the top edge of said blocks 9 and upon the tops of the joists in front of the flooring 6 in order to bring the top edges of said blocks and joists on a line with the top of said flooring.

The sheet-metal covering 7 is extended over the strips 10 on the joists and blocks 9, said sheet-metal covering being extended downwardly and inwardly between all of said joists to form the inclined drip-plates 11, the same being fixed upon triangular blocks 12, that are held in any suitable manner to the upper portions of the sides of the joists and faces of the blocks 5 and 9.

Removably arranged in the spaces between the joists 3 beneath the inclined drip-plate 11 are the drain-pans 13, the same being constructed, preferably, of sheet metal or wood frame metal-covered, which pans are slightly smaller each way than are the spaces 3^a, which they occupy, and said pans necessarily occupy the same inclined position as do the joists 3.

Drain-pipes 14 extend downwardly from the forward ends of the pans 13, all of which pipes discharge into a drain-trough 15, preferably of sheet metal or wood frame metal-covered, said trough being slightly inclined and resting at its ends upon blocks 15^a, fixed in the end walls of the structure. A dis-

charge-pipe 16 leads from the lower end of this trough outwardly through the refrigerator-wall.

Extending across the rear end of the flooring 6 is a strip 17, against which the lower end of an ice-rack 18 is supported, the upper end of said rack resting against a strip 19, secured to the top or ceiling of the refrigerator. The lower portion of this rack is constructed with an air and moisture proof wall 20, the upper portion being slatted. An inclined partition 21 cuts off the dead-air space 21^a in front of the slatted portion of this rack, which space is formed by the meeting of the top or ceiling of the refrigerator with the wall thereof.

Ordinary slatted ice-racks 22, similar to the racks 18, without the wall 20, are positioned against the end walls of the refrigerator, also against the side wall opposite from the rack 18, and the space between said racks is occupied by the supply of ice, the same resting directly upon the flooring 6 and sheet-metal-covered joists 3. The air circulating from the storage-room passes upwardly between the rear ends of the joists 3, in front of the closed lower portion of the rack 18, through the flue above the joists, and from thence through the open upper portion of said rack into the ice-chamber. The air after being cooled by its passage over and between the pieces of ice passes downwardly over the drip-plates 11 and from thence through the spaces between the drain-pans 13 and joists 3 to the storage-chamber. This circulation of air, as described, and indicated by the arrows in Figs. I and II, is produced without ventilation or the introduction of outside air, and all the moist air containing odors arising from the articles in the storage-room is condensed by contact with the ice, which condensation is carried off with the drainage resulting from the melted ice. This drainage passes downwardly over the drip-plates 11 into the drain-pans 13, thence through the pipes 14 into the trough 15, and from thence out through the discharge-pipe 16. Thus by my improved construction all the air on the interior of the refrigerator is cooled, a stationary temperature is maintained, and a great saving of ice is effected. All the fixed parts of said refrigerator with which the ice and water come in contact are metal-covered in order to prevent decay.

My improved structure may be made in sections for the larger refrigerators for cold-storage warehouses, so as to be portable and easily handled while being shipped or placed in position, and the supporting beams or timbers for the structure may be placed in position after all the other work on the walls of the refrigerator or cold-storage house has been finished.

By my improved structure there is an increased capacity of the ice-chamber, there being a loss of space on but one side of said chamber, said space performing the function of an air flue or duct, thus proportionately increasing the cooling capacity of the refrigerator and also reducing the number of operations required in refilling the ice-chamber. The ice-chamber besides providing a bearing for the ice forms a receptacle for the dripping from pipes when the refrigerator or cold-storage house is being operated by the refrigerator-machine and also provides for a perfect circulation of all the air within the refrigerator, and said air is dried and purified in its passage through the ice-chamber and storage-room. The air in its circulation follows its natural inclination—that is, of the cold air descending and the warm air rising—the circulation being in but one direction without counter currents and without the aid of any automatic arrangements or outside influences. By the location of the inclined pieces 8 and 21 the collection of moisture and condensation in the corners cut off by said inclined pieces is prevented, and no condensation or sweat will collect upon the under side of the receptacle for the reason that warm air rising cannot contact with the under side of said receptacle by reason of the inclined pieces 8.

I claim as my invention—

A refrigerator comprising double walls, the transverse timbers secured to the front and rear walls respectively, the strip located on the front timber, the series of joists supported in inclined position on the front and rear timbers, the intermediate blocks between the joists providing front air-spaces, the flooring laid on the rear ends of the joists and on the intermediate blocks, the front blocks uniting the front ends of the joists, the strip surmounting the front blocks, the sheet-metal covering extending over the flooring and providing inclined drip-plates within the front air-spaces between the joists, the drain-pans located in the air-spaces beneath the drip-plates, having drain-pipes, the trough located beneath the drain-pipes and having a discharge-pipe, the lower and upper strips, the ice-racks, and the air and moisture proof wall secured to the rear ice-rack provided with a rear flue extending from the spaces between the rear ends of the joists.

EDWARD J. WIRFS.

In presence of—
E. S. KNIGHT,
M. P. SMITH.