(No Model.) 3 Sheets—Sheet 1.

J. H. RIDGWAY, Dec'd.,

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REFRIGERATING CHAMBER FOR RAILWAY CARS, &c.

No. 270,126. Patented Jan. 2, 1883.

Fig. 7.

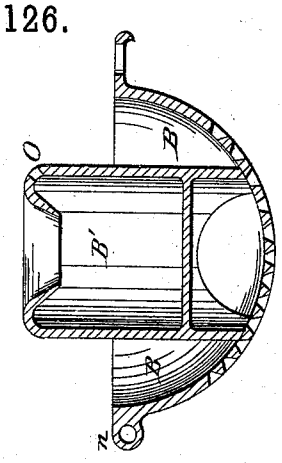


Fig. 8.

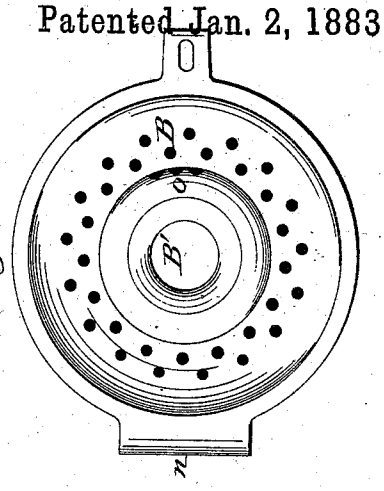
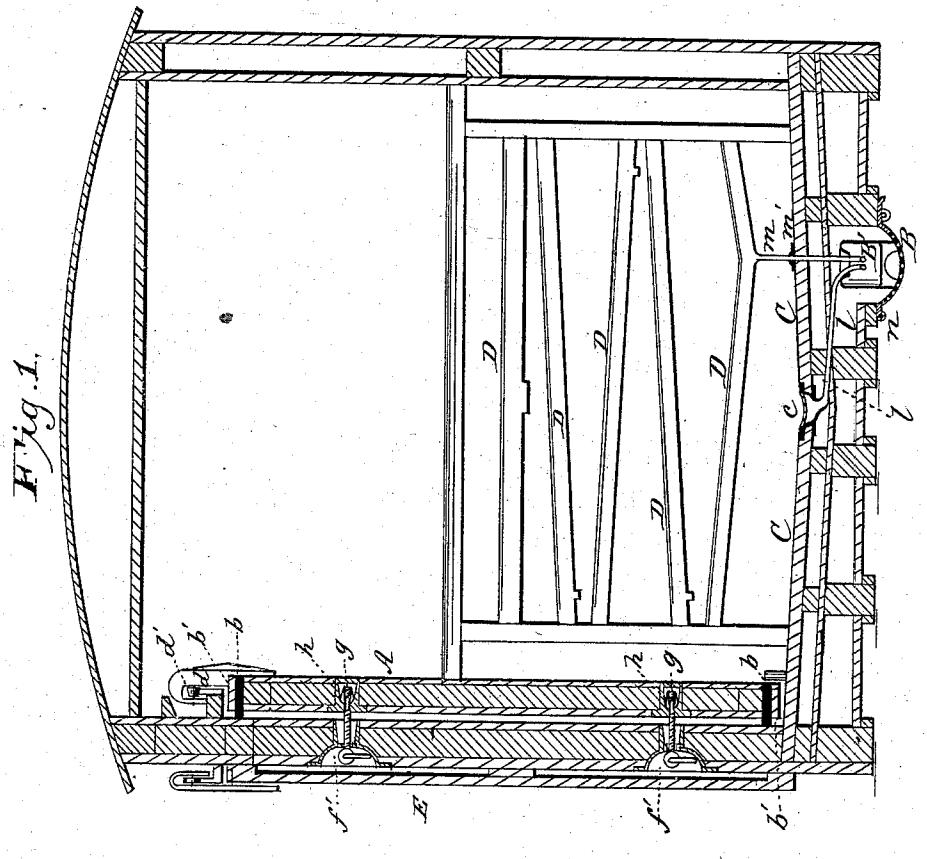


Fig. 1.



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Inventor:
Jos H. Ridgway
by Johnson & Johnson
Attys.

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 3 Sheets—Sheet 2

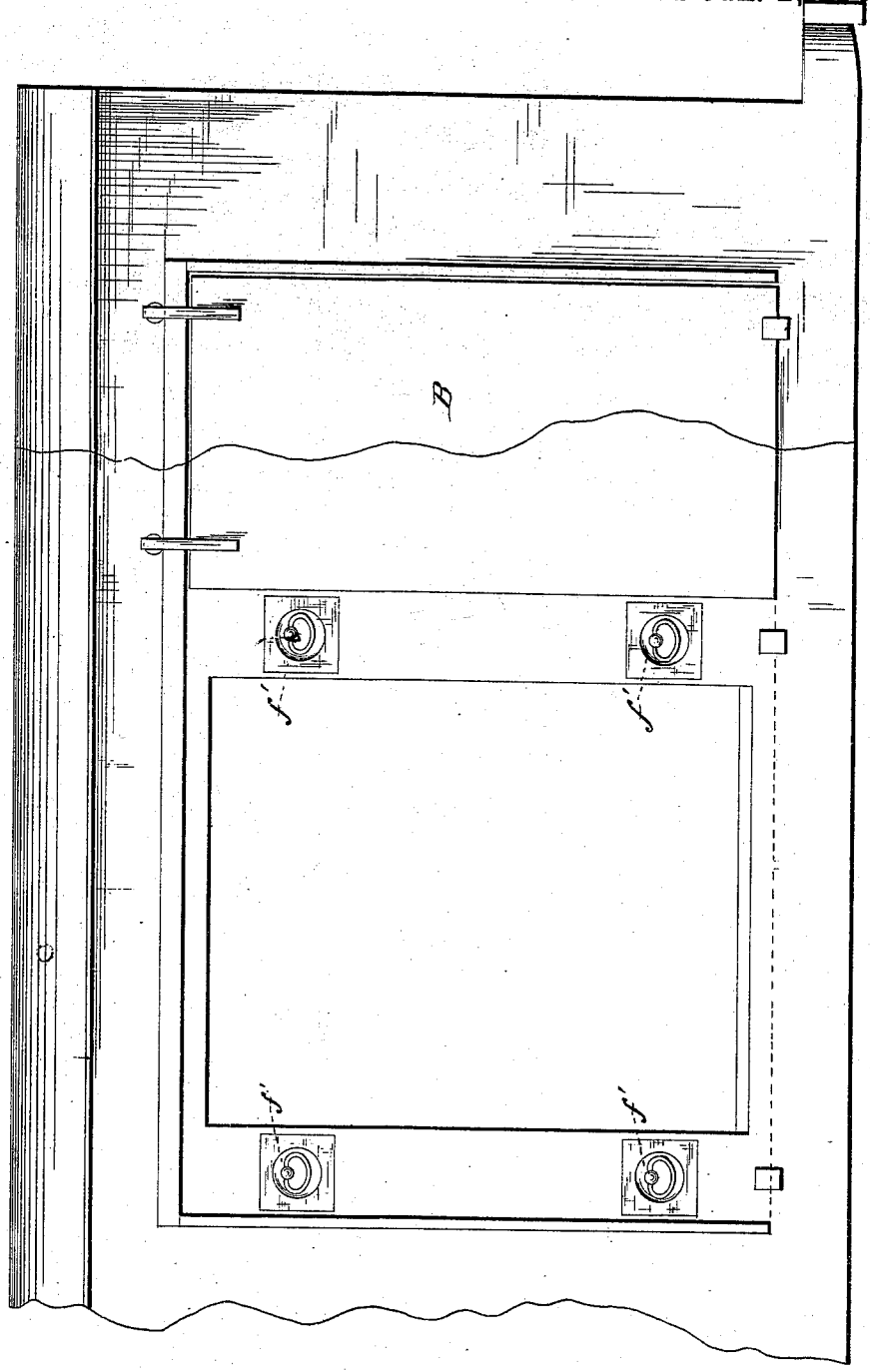
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No. 270,126. Patented Jan. 2, 1883.

Fig. 2.



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REFRIGERATING CHAMBER FOR RAILWAY CARS, &c.

No. 270,126 Patented Jan. 2, 1883.

Fig. 3.

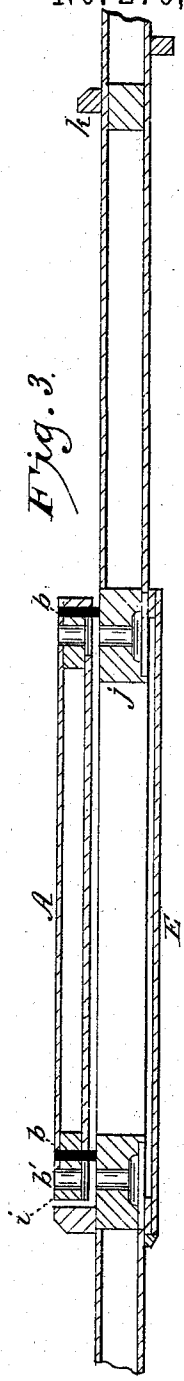


Fig. 4.

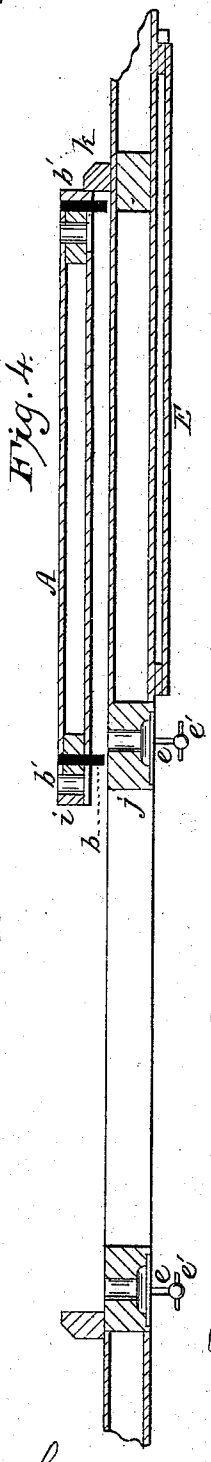


Fig. 6.

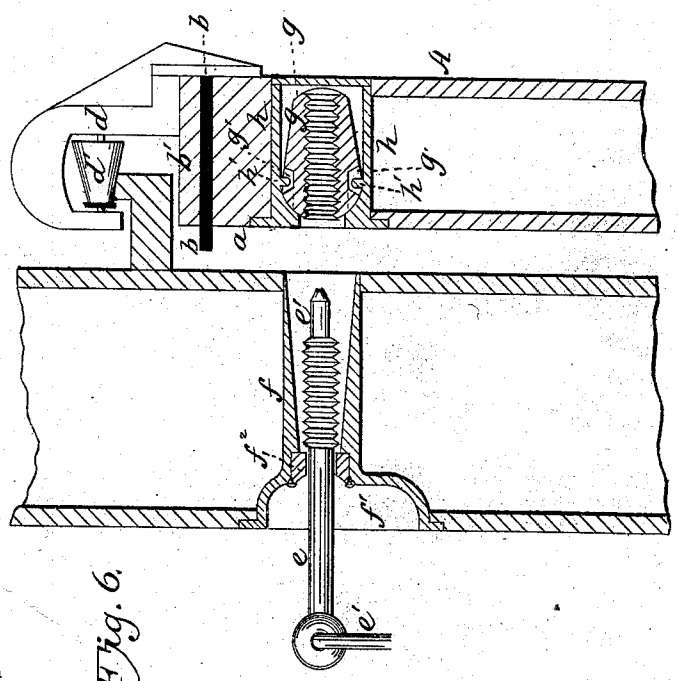
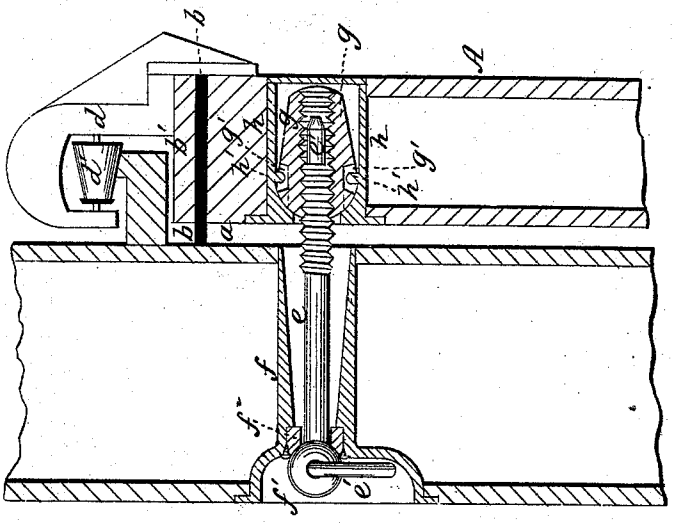


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOB H. RIDGWAY, OF PHILADELPHIA, PENNSYLVANIA, (FRANCELIA W. RIDGWAY ADMINISTRATRIX OF SAID JOB H. RIDGWAY, DECEASED.)

REFRIGERATING-CHAMBER FOR RAILWAY-CARS, &c.

SPECIFICATION forming part of Letters Patent No. 270,126, dated January 2, 1883.

Application filed May 16, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOB H. RIDGWAY, a citizen of the United States, residing at the city and county of Philadelphia, in the State of Pennsylvania, have invented new and useful Improvements in Refrigerating-Chambers for Railway-Cars and other Structures, of which the following is a specification.

My invention relates to improvements in chambers or storage-rooms adapted for maintaining atmospheric air in a pure, dry, low temperature for the preservation of perishable articles, whether stored in permanent refrigerating-rooms for immediate use by provision-dealers, or in railway-cars for transportation as articles of commerce to remote markets in all seasons.

The objects of my improvements are to render the preserving-chamber or storage-room practically air-tight with a sliding door, whereby to prevent the influx or entrance of the outside air, by which the condition of that within the storage-room would be affected; to provide a secure fastening for a sliding sealing-door; to provide for carrying off the drip-water from the ice, together with the water of condensation on the troughs, while excluding the entrance of air into the cold storage-room; and to facilitate the cleaning of the sealing drip cup or receptacle of collected matter.

The accompanying drawings illustrate my improvements as applied to an air-tight storage-chamber of a railway-car adapted for refrigerative purposes; but it will be understood that the particular matters of these improvements are alike applicable to refrigerative structures of large capacity—such as used in store-houses and by provision-dealers—and that their employment in a non-conducting structure, in which the insulation of the walls, roof, and floor from the influence of outside temperatures and from frost, may be effected in any of the well-known ways.

Referring to these drawings, Figure 1 represents a vertical transverse section of the body of a car, showing the sliding sealing-door in its sealed position on the inner wall or shell, and the outside sliding non-sealing door in position to cover and conceal the fastenings of said sealing-door, showing also the relation of the hinged sealing drip cup or receptacle to the drip-pipes of the floor and of the refrigerating drip-troughs; Fig. 2, an elevation of so much of the side of a car as shows the doorway, the outside sliding non-sealing door being in opened position to expose the arrangement of the fastenings for the sliding sealing-door; Fig. 3, a horizontal section of a portion of the side of a car, showing the inner sliding sealing-door in position to seal the doorway, and the outer sliding non-sealing door closed. Fig. 4 shows a similar sectional view with both doors opened. Fig. 5 shows an enlarged sectional view of one of the fastening devices for the sliding sealing-door in the position it occupies when the door is fastened. Fig. 6 shows a similar sectional view, the fastening device being in the position it occupies when the door is unfastened. Fig. 7 shows an enlarged sectional view of the hinged sealing drip cup or receptacle, and Fig. 8 a top view of the same.

As dry, cold, pure air is essential for perfect preservation of all perishable articles of food, I prefer a system for maintaining these conditions of the air confined on the closing of the storage-room, such as that shown and described in my Patent No. 159,843, dated February 16, 1875, in which an automatic circulation of the confined air is effected and maintained within the storage-room by the same means which effects the condensation of the moisture and the pure condition and low temperature of the air. My present improvements, however, may be used with any system or plan of refrigeration.

In Fig. 1, D indicates a series of metallic troughs, having inclined walls arranged to receive the drip from an ice-chamber or other cooling medium, and to extend backward and forward in opposite inclined relation to each other, so that while the flow will be from one to the other the water of condensation will be from the inclined walls of one into the open top of the other.

The doorway is closed by a sliding inner and outer door hung by suitable hangers or supported by bottom rollers.

The inner door, A, is preferably the sealing one, and is made non-conducting to heat, as the walls of the chamber, while the outer door, E, is non-sealing, and serves primarily as the

locking-door to cover and protect the fastenings of the inner door when closed and sealed. The employment of a sliding sealing-door gives important advantages in compactness for storage-room. It is sealed when closed by strips of rubber, *b*, secured around the edges of the door by cleats *b'*, or otherwise, and projecting a suitable distance beyond that side, *a*, of the door which is next the inner wall of the chamber, with which said rubber is brought into sealing contact. This rubber may be a flat strip, or doubled on itself in the form of a loop, and may be secured in the car wall or frame, so as to project in position to seal the door when closed. It is important, in opening and closing the door, that the sealing-edge of the rubber strip be kept free from wearing or rubbing contact with the chamber-wall, and for this purpose the rollers *d'* of the hangers *d* are made conical, their smallest ends being next the car-wall, while the track or rail on which the rollers run is beveled to correspond with the taper of the rollers. The length of the rollers is greater than the thickness of the beveled rail or track on which they run, and this, in connection with the conical form of rollers, will allow the door, by reason of its weight, to shove off from the wall of the chamber in being slid to open and close it, and thereby prevent friction and wear of the sealing-edge and render it easier to slide the door.

The fastening device for the door consists of screw-bolts fitted in non-threaded metal holders in the wall or jambs of the chamber, and self-adjusting nuts fitted in the door, so as to receive the bolts. The holders for the screw-bolts are formed of a hollow part, *f*, passed through the wall or jamb of the chamber, and a sunken or cup part, *f'*, the rim or edge of which is flush with and secured to the outer wall or jamb of the chamber. The hollow part *f* extends inward flush with the inner wall of the chamber, and its interior flares to its inner end. The screw-bolt *e* is provided with a handle, *e'*, preferably a swing-handle adapted to hang within the sunken or cup end, so as not to interfere with the sliding of the outside door. The bolt has a raised thread, and a concave collar, f^2, secured in the cup end of the holder, serves as a bearing for the unthreaded part of the bolt and its circular head, and prevents it from being drawn entirely out of its holder, while the screw-thread, being short, allows the bolt to be drawn out far enough to bring its inner end entirely within the hollow holder, as shown in Fig. 6. These fastening-bolts are arranged near the four corners of the doorway, as shown in Fig. 2, and the nuts *g*, into which they screw, are secured in housings or sockets arranged in the door, so as to be in positions opposite the bolts when the door is closed. The nut is of elongated form, has a curved or semi-cylindrical end, and is secured within a metal socket or housing, *h*, which is secured by a flange within the door. This socket *h* has a curved interior corresponding to the curved end of the nut, so as to allow the latter to have a slight ball-and-socket movement for a purpose to be presently stated. The nut is prevented from turning with the bolt by lugs *h'* on the inner side of the socket *h* entering recesses *g'* in the sides of the nut. The inner end, *e'*, of the bolt *e* is pointed, and for a short distance has no thread, and is of such diameter as to allow it to enter the threaded opening of the nut and bring it in line with the bolt by reason of the capacity of the nut to turn as upon a ball-and-socket joint. The flaring of the hollow part of the bolt-holder and the concave collar f^2 allows a certain vibration of the bolt, and this permits its end to enter the nut in the door, even though, by reason of the rock of the car, the nut in the car-door, when closed, should not come directly opposite the center of the bolt-holder. When so closed the bolts are entered in the nuts and turned by their handles, so as to draw the door sealing-strips hard and uniformly against the wall of the chamber, compressing the rubber, and effectually sealing the doorway. The inner and outer door of each side slide or open toward the same end of the chamber, and the outer door being opened the bolts may be unscrewed and pulled out till their threaded parts strike the fixed collars f^2, when the inner door may then be slid open, but is prevented from opening farther than to bring the edge *i* of the door A flush with the door-jamb *j* by a cleat or stop, *k*, on the inner wall of the chamber, as shown in Figs. 3 and 4. Both doors being open, and the fastening-bolts drawn out to their full extent, it is evident that they will cross the path of the outer door and prevent it being closed until the inner one has been closed and all the bolts secured, because in the open position of the doors two of the bolts will be prevented from being forced in, as the inner door will present a solid surface to the entrance of said bolts. It is impossible, therefore, to close the outer door without first closing the inner one, and the latter cannot be left open or unsealed by accident. The vertical sealing-strips are arranged so that in opening and closing the door they do not cross the bolt-openings of the chamber-wall, and there is no danger of the rubber strips being cut or torn should the bolts not be pulled entirely out while opening and closing the door, as shown in Fig. 3.

The sealing-door may be arranged on the outer side of the chamber, or between its walls; but however arranged the rubber strips must project either from the side of the door or the jambs and the sealing of the latter effected by a compound movement—that is to say, a lateral movement at right angles to the wall—to effect the compression of the rubber strips uniformly around the four edges of the door, and a vertical movement by the action of the conical hanging rollers upon the fixed track, the extent of which must be sufficient to free the rubber strips from the wall when the screw-fastenings are withdrawn from the door-nuts.

The floor C of the chamber inclines down-

ward from the sides to the middle, where it is provided with a grating, *c*, whereby water or drippings from the meat or other articles may be trapped off by a sealed waste-pipe and drip-receptacle. This receptacle consists of a cup, B′, centrally fixed in a basin, B, having its bottom perforated, and hinged or otherwise removably secured to the bottom of the car or chamber, and provided with a hasp and staple, or other suitable means by which it may be locked.

The waste-pipe *l* connects with the floor-grating and enters the top of the drip-cup, and the drip-pipe *m* from the refrigerating-troughs also enters the drip-cup, within which both these pipes are sealed against the entrance of air into the chamber by the drip or flow from the troughs. A collar, *m′*, on the drip-pipe *m*, fastened to the floor, prevents the end of the pipe, when once adjusted, from being pushed too far in or pulled too far out of the cup B′. The top edge of the cup B′ is folded or turned in upon itself, by which it is prevented from being emptied by slipping over upon a sudden stoppage or jerk of the car. The perforations in the basin permit the overflow from the cup to pass off, the cup being supported by legs upon such perforated bottom. Preferably the basin is hinged at *n*, so that when unlocked and allowed to drop down the cup will be tilted over and empty its contents through one or more openings or perforations, *o*, in the side of the cup, under its turned-in top, as shown in Fig. 7. This facility for emptying the drip-cup is important to keep the cup clean and free from smell, while the locking of the basin maintains the proper relation of the cup with the pipes against unauthorized interference. While, therefore, it is important that the drip-cup should be removable for cleaning, it is also important that its proper relation to the drip-pipes should be made secure to maintain the seal, as stated. The floor may be provided with two or more gratings, and two or more drip-receptacles may be used, if desired.

The collar f^2 is in two pieces, and secured, after the screw is inserted, by small screws in the joint, as shown; and the socket *h* is provided with a removable cap to allow the nut to be put in place, having side grooves to allow it to pass the lugs *h′* of the socket.

I claim—

1. The combination, with a refrigerating-chamber, of an inner and an outer sliding door, the inner one of which is provided with a sealing-strip and the outer one arranged to cover the fastenings by which the inner door is both sealed and secured to the chamber-wall, substantially as described, for the purpose specified.

2. The combination, with a refrigerating-chamber, of a sliding door having a sealing-strip, adapted to be sealed when slid over the doorway, and to fall away from such sealing relation when unfastened, substantially as described, for the purpose specified.

3. In combination with a refrigerating-chamber, the inner and the outer sliding doors, one of which is the sealing-door, and means, substantially as described, for sealing and securing said door.

4. In combination with a refrigerating-chamber, a sliding door bounded by rubber sealing-strips projecting next to and at right angles to the wall of said chamber, and means, substantially as described, for compressing said sealing-strips and securing the door when sealed.

5. The combination, with a refrigerating-chamber having a doorway in its vertical wall, of an inner and an outer sliding door, one of which is bounded by a face sealing-strip, self-adjusting screw-nuts carried by said sealing-door, and screw-bolts for fastening the latter, having convex bearing-heads seated in the outer wall of said chamber, substantially as described, for the purpose specified.

6. The combination, substantially herein described, in a refrigerating-chamber, of an inner and an outer sliding door, one of which is the sealing-door, self-adjusting screw-nuts carried by said sealing-door, screw-bolts for fastening the latter, having swiveling bearing-heads in the outer wall of said chamber, and tubular holders for said fastening-bolts, having their inner walls flaring to and opening within said chamber, substantially as described, for the purpose specified.

7. In a refrigerating-chamber, the combination of a sliding door, bounded by a face projecting sealing-strip, with means, substantially herein set forth, whereby said sealing-strip is clamped upon the chamber-wall in sealing the doorway, and means whereby the release of said sealing strip from contact with said chamber-wall, when the door is unfastened, is effected automatically, thereby allowing the door to be slid in open and in closed position without wear or injury to the said sealing-strip.

8. The combination, substantially herein before set forth, with a refrigerating-chamber, of a sliding door bounded by sealing-strips, the conical hanging rollers, a beveled wall-track, and means, substantially described, for compressing said sealing-strips and securing the door when closed.

9. The combination, in a refrigerating-chamber, of a sliding sealing-door and self-adjusting screw-threaded nuts carried thereby with laterally-adjustable screw-bolts, having a sliding connection with the chamber-wall, for the purpose set forth.

10. The combination, substantially herein before set forth, in a refrigerating-chamber, of a sliding sealing-door, having self-adjusting nuts, with screw-bolts having non-threaded connection with the chamber wall or jambs and non-threaded inner ends, for the purpose stated.

11. The combination, substantially herein set forth, in a refrigerating-chamber, of an inner sealing and an outer non-sealing sliding door with a fastening device for the sealing-door, consisting of the ball-and-socket bearing-

nut *g*, secured in said door, the screw-bolt *e*, and its holder, having a flaring interior and a sunken or cup end, within which the said screw-bolt has a non-threaded connection, for the purpose stated.

12. The described sealing-door for a refrigerating-chamber, consisting of non-conducting walls, face projecting sealing-strips, conical hanging rollers, and self-adjusting nuts, in combination with fastening-screws suitably secured in the wall of the chamber, substantially as described, for the purpose specified.

13. In combination with the sliding sealing-door of a refrigerating-chamber, the nuts *g*, their holders *h*, forming ball-and-socket bearings, having provision for preventing the turning of the nuts, while allowing of their adjustment, the screw-bolts *e*, and their hollow flaring holders *f*, provided each with a collar, *f'*, forming a concave bearing for the bolt-head, a stop to limit the outward movement of the bolt, and, in connection with the flaring holder and the circular bolt-head, allow of the lateral adjustment of the bolt in relation to the nut, substantially as described, for the purpose specified.

14. The combination, in a refrigerating-chamber, of an inner sliding sealing-door, with fastening devices therefor arranged within the doorway-jambs, and an outer non-sealing sliding door arranged to close over said fastening devices when the sealing-door is fastened, and prevented from being closed when said inner door is open, substantially as described, for the purpose specified.

15. The combination, with a refrigerator-chamber having its floor sloping downward from each side, provided with a grating or gratings, of an overflow sealing drip-cup removably locked within a recess in the under side of the floor of said chamber, substantially as described, for the purpose specified.

16. In a refrigerating-chamber, the combination, with the floor drip-pipe *l*, of a removable drip-cup consisting of a perforated basin, B, and a central overflow sealing-cup, and means, substantially described, whereby said basin is locked to the bottom of the chamber-floor to secure the sealing-cup in proper relation to said drip-pipe, substantially as described.

17. The drip-receptacle herein described, consisting of an overflow sealing-cup, B', and a perforated basin, B, the overflow-cup having a central relation to said basin of less diameter, and rising from its bottom, substantially as described, for the purpose specified.

18. The combination of a refrigerating-chamber, having its floor provided with a draining-grating, with the perforated basin B, the drip-cup B', having its upper end turned inward, and provided with one or more side openings, *o*, and the drip-pipes *l m*, substantially as described, for the purpose specified.

19. The drip-receptacle composed of an overflow-cup, B', and a perforated basin, B, in combination with a floor drip-pipe, *l*, and a drip-pipe, *m*, communicating with refrigerating apparatus.

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

JOB H. RIDGWAY.

Witnesses:
E. H. BAILEY,
BENJ. R. BRAISTED.