Oct. 16, 1951 C. BLUM 2,571,664

TRACK DOOR STRUCTURE

Filed Oct. 31, 1945 2 SHEETS—SHEET 1

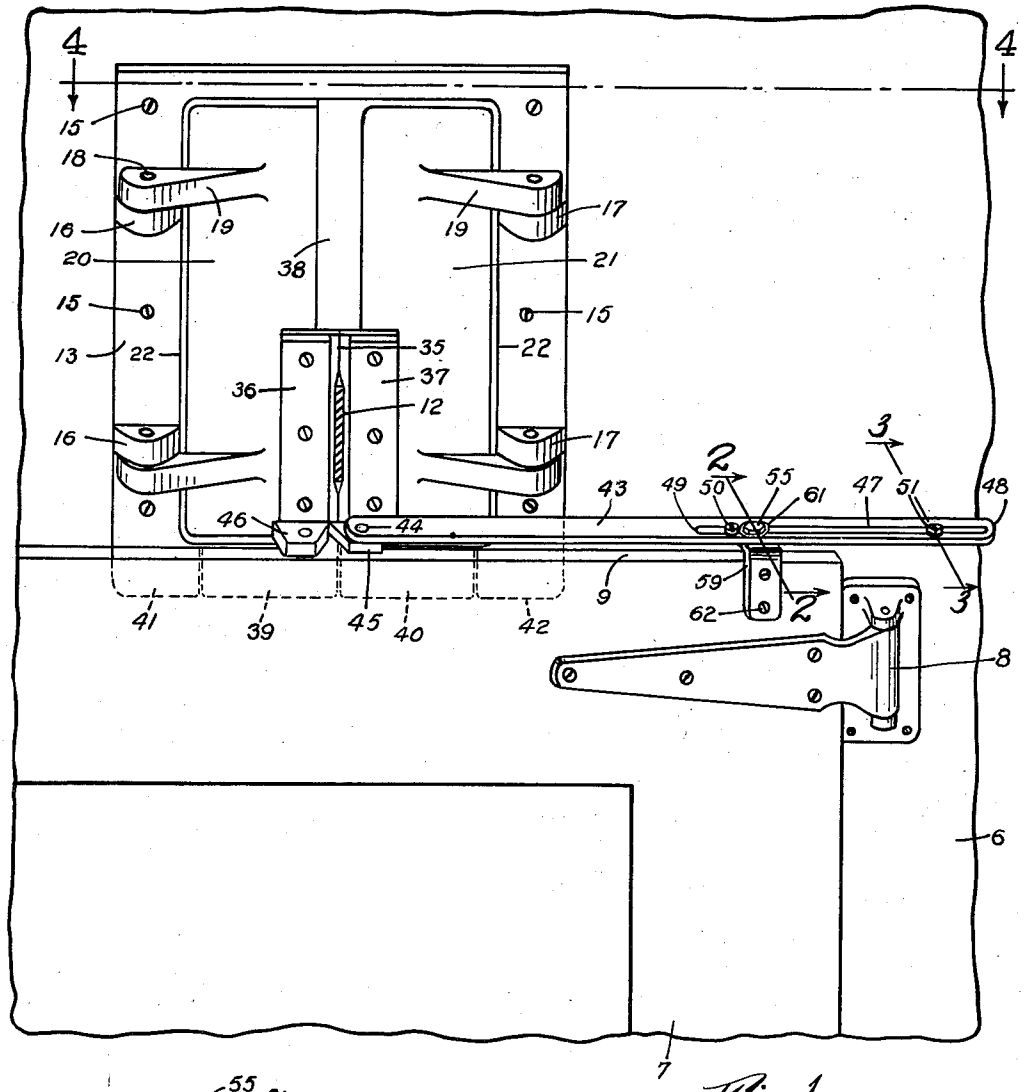


Fig. 1.

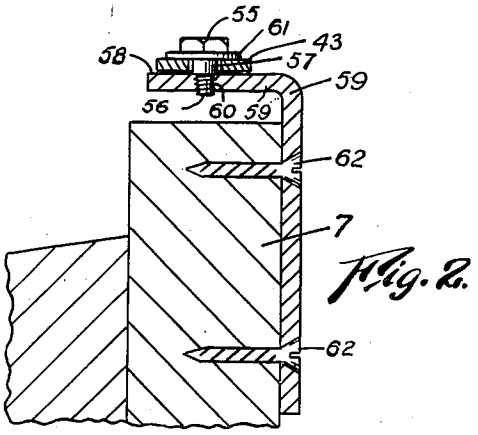


Fig. 2.

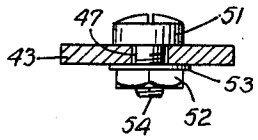


Fig. 3.

INVENTOR.
CHASE BLUM
BY Zugelter & Zugelter
Attys.

Oct. 16, 1951 C. BLUM 2,571,664

TRACK DOOR STRUCTURE

Filed Oct. 31, 1945 2 SHEETS—SHEET 2

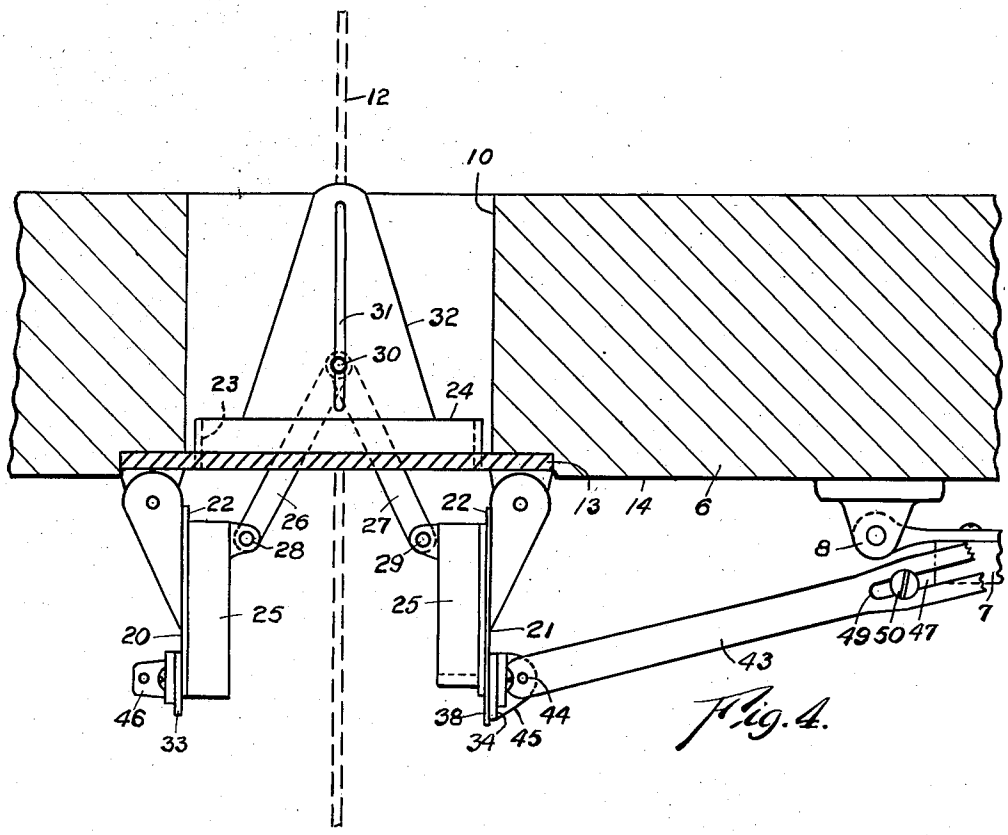


Fig. 4.

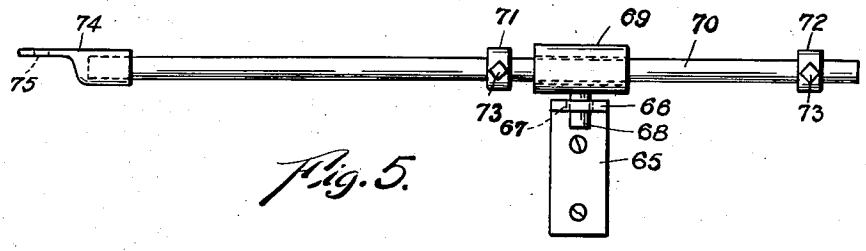


Fig. 5.

INVENTOR.
CHASE BLUM
BY
Zugelter & Zugelter
Atty's.

Patented Oct. 16, 1951 2,571,664

UNITED STATES PATENT OFFICE

2,571,664

TRACK DOOR STRUCTURE

Chase Blum, Cincinnati, Ohio

Application October 31, 1945, Serial No. 625,751

1 Claim. (Cl. 268—14)

1

The present invention relates to improvements in a track door structure, such as may be applied above the main door of a refrigerator or other compartment wherein the temperature is to be maintained at a predetermined constant.

One of the principal objects of the invention is to provide a track door structure with means operative incident to opening and closing the main door of the compartment, whereby the track door is opened and closed without injurious strain upon the working parts thereof, irrespective of the extent of swinging movement of the main door of the compartment.

Another object of the invention is to provide for full adjustability of track door actuation, so that the track door assembly may be associated with main doors that swing open to the maximum extent of 180°, or any intermediate angle.

Another object is to provide adjustment means in association with a track door assembly, whereby the main door may be opened to an intermediate position short of a full open position, without disturbing the normally closed position of the track doors, thereby to prevent unnecessary leakage and transfer of chilled air to the exterior of the refrigerated compartment when the main door is opened merely for purposes of ingress and egress on the part of an attendant.

Another object is to provide means for the purposes stated, which may be inexpensively manufactured, and installed upon a refrigerator, cooler, or similar compartment, with a minimum of labor and expense, and without the aid of skilled mechanics.

The foregoing and other objects are attained by the means described herein and illustrated in the accompanying drawings, in which:

Fig. 1 is a fragmental perspective view of the front of a refrigerator or compartment, with the device of the invention applied thereto.

Fig. 2 is an enlarged cross-sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is an enlarged cross-sectional view taken on line 3—3 of Fig. 1.

Fig. 4 is a cross-sectional view taken on line 4—4 of Fig. 1, the track doors being open.

Fig. 5 is a side view of a modification.

Track door structures in general, have been customarily applied to coolers and like compartments for the storage of meats and other commodities which required transport into and from the compartment by means of a carriage suspended from an overhead track or rail. The track or rail entered the compartment above the main door, through an opening provided in the

2

front wall of the compartment. To prevent temperature losses about the rail or track, it was customary to provide a track door arrangement that fitted about the track or rail in sealing relationship so long as the main door of the compartment remained closed. Upon opening the main door, suitable mechanism was operated to remove the track door from sealing relationship about the track, so that a carriage might be moved along the track, into or from the interior of the compartment. The general arrangement above referred to has been in general use in abattoirs and meat storage establishments.

The purpose of the present invention is to improve upon track door structures and the means employed for actuating them incident to opening and closing movements of the main compartment door. In particular, the invention contemplates improved controls for the track door assembly, so that unnecessary temperature losses will be eliminated, and application of the invention made possible in a practical way, irrespective of the extent to which the compartment door may be swung open.

Referring to Fig. 1 of the accompanying drawings 6 indicates the front wall of an insulated compartment, and 7 indicates a main door closing an opening in the front wall. The door and the opening are in practice made sufficiently large to permit an attendant to walk into the compartment, and as is customary, the door may be hung on the compartment wall by means of a series of hinges 8. For purposes of illustration and explanation, the door shown herein is one which overlaps the compartment wall, the thickness of the door flange or overlaping portion being indicated by the character 9. In some instances the door may be flush with the outer face of wall 6, but irrespective of this detail the present invention is applicable.

At a location above the doorway, the wall 6 is cut away as at 10 to provide a track opening in communication with the main opening of the compartment. A track or rail 12 (Fig. 4) extends through the opening 10 at an elevation slightly above the level of the top of the door, so as to accommodate a carriage (not shown) from which may be hung heavy objects such as animal sides or the like to be transported along the track or rail by means of the carriage. Where the track or rail enters the compartment through opening 10 of the wall 6, it is necessary to provide a means of sealing the opening and the space about the track or rail, particularly when the main door of the compartment is closed.

A suitable closure is furnished by means of a track door support frame 13, which may be desirably of rectangular configuration, said frame being applied to the outer face 14 of the compartment wall by means of suitable fasteners 15. The frame overlaps the margins of opening 10, so as to provide a sealed joint at the frame.

Frame 13, as illustrated upon Fig. 1, carries a series of hinge lugs 16 and 17 at opposite sides of the frame, to support hinge pins 18 whereby hinge lugs 19 of the track doors 20 and 21 are arranged for swinging movement outwardly and away from the forward face of the compartment wall (see Fig. 4). The hinge lugs for the track doors may be integral therewith if desired, and will preferably extend outwardly beyond the outer flanges 22 of the track doors. These flanges, which extend around three sides of the doors, serve to effect a seal with the outer face of frame 13. The opening 23 in the rearward extension 24 of the frame is thereby effectively closed against temperature losses at locations about the three outer edges of the track doors. Each track door may be furnished at its inner face, with a metallic casing 25 containing a quantity of insulating material. When the track doors are closed, the insulating means 25 are disposed interiorly of the frame opening 23.

In order that the doors may be swung in unison to the opened and closed positions, a suitable equalizing means may be furnished which, as herein illustrated by way of example, may consist of a pair of links 26 and 27 pivoted at 28 and 29 upon the members 25, the links at their inner ends being pivotally joined by means of a stud 30. Stud 30 extends through an elongated slot 31 formed in a rearwardly extending plate 32 supported horizontally at the rear of the track door frame. The links being of equal length, will perform to move the track doors in unison about their respective hinge pins as one or the other of the track doors is manipulated to opened or closed position. Plate 32 and the equalizing links are located above the track or rail 12, so that they will not interfere with movement of a carriage along the latter when the main door 7 and the track doors 20 and 21 are in the opened position.

In order that the track doors when closed will effect a substantial seal about the track or rail 12, the doors at their free vertical edges are provided with resilient sealing pads 33 and 34, margins of which extend outwardly from the doors a sufficient distance so as to meet along a line 35 (Fig. 1) when the doors are closed. Where the track or rail 12 is interposed, however, the sealing pads will closely hug opposite faces of the track or rail for effecting a substantial seal at those locations. The sealing pads may be of rubber, fabric, or other appropriate resilient and flexible material. The pads may be held in place upon the outer face of each track door by means of pad clamp plates or the like 36 and 37. A flange 38 of track door 21 may be utilized for sealing the meeting edges of the doors above the sealing pads, it being understood that said flange 38 of track door 21 overlies a marginal portion of the other track door 20.

Referring to Fig. 1, the characters 39 and 40 indicate depending bumper flanges upon the doors 20 and 21, said flanges being in substantially the plane of the compartment wall 6 at its outer face 14, so that the main door 7 when closed, will abut the members 39 and 40 to hold the track doors in the closed sealing position. The bumper flanges or projections 39 and 40 preferably are integral rigid extensions formed along the lower edges of the track doors. The vertical sides of the track door frame carry similar bumper projections 41 and 42, which are normally in the plane of wall surface 14, and of the bumper flanges 39 and 40. The foregoing construction ensures a tightly closed condition of the track doors whenever the compartment main door 7 is fully closed.

The actuating means for the track doors comprises an elongated actuator bar 43, one end of which may be pivoted as at 44 to a perforated extending ear 45 formed integrally with or otherwise applied to one of the track doors such as 21. A substantially similar perforated ear 46 may be furnished upon the other track door 20, for use in the event that the main door is a left-hand door, rather than a right-hand door as shown. Actuator bar 43 may be in the form of a flat strap of metal lying in a horizontal plane, and adapted for movement in correspondency with a track door 21 by virtue of the pivotal connection 44. The bar is furnished with a longitudinal slot 47 which extends from a location near the outer end 48 of the bar, to a point 49 intermediate the ends of the bar. A pair of adjustable stops, indicated at 50 and 51, are applied to the actuator bar within the limits established by the opposite ends of slot 47, these stops being utilized for controlling the operating movements of the track doors.

The adjustable stops 50 and 51 may be varied in character, and may clamp onto the actuator bar in any approved manner. By way of example, the adjustable stops may be characterized as illustrated by Fig. 3, wherein is shown a stop in the form of a screw 54, the shank of which extends through slot 47 of the actuator bar to receive a fastening nut 52 and a washer 53. The head of the screw constituting the adjustable stop, may be slotted as shown in Fig. 3, or otherwise adapted for application of a tool whereby the stop may be fixed at any desired location along the length of slot 47. Stops 50 and 51 preferably will be identical to one another, for convenience in applying and adjusting them to the actuator bar.

Between the stops 50 and 51, the slot of the actuator bar receives a pivot member 55 which is securely fixed relative to the main door 7 of the cooler compartment. This pivot member may be furnished in any desired form, and may conveniently consist of a headed screw having a threaded end 56 and a smooth shank 57, the shank being shouldered as shown in Fig. 2 so as to abut the upper face 58 of a bracket or bar support element 59 when the screw is fully tightened by driving it into the threaded bore 60 of the bracket. The head of the bolt may carry a washer 61 of proper thickness such that it will not tightly clamp the actuator bar 43 when the screw is tightened upon the bracket. In other words, the actuator bar shall be freely slidable upon the face 58 of the bracket at all times. If desired, the thread end 56 of the screw may be extended sufficiently through the bracket to accommodate a lock nut preventing accidental loosening of part 55 with repeated opening and closing movements of the main door.

Bracket 59 may be applied to the main door 7 in any suitable manner, such as by means of screws or other fasteners 62 anchored in the material of the door. The bracket will be applied to the door at a distance from the axis of hinge 8, so that when the door is swung about its hinge

mountings, the pivot member 55 will be caused to travel lengthwise of the actuator bar slot 47.

In perfecting the installation of the track door structure of the invention, the frame 13 is applied to the opening 10 about the track or rail 12, whereupon the bracket 59 may be applied to the main door as previously stated. Stop 50 will be securely fixed upon the actuator bar at a location such that the pivot member 55 will contact the stop and move the track doors to the fully closed position as main door 7 assumes a closed position. Should the closing stop 50 be fixed to the bar at an insufficient distance from the slot end 49, this fact will not prevent proper closing of the track doors, because they will nevertheless assume a fully closed position when their depending bumper flanges 39 and 40 are struck by the main door in closing.

The second adjustable stop 51 will be fixed upon the actuator bar at a location which will depend largely upon the extent of swing of main door 7, which in some cases may be 90° or less, while in other instances it may approach or reach 180° from the fully closed position of the main door. If the main door, for example, can be swung open through an arc of 180°, the opening stop 51 will preferably be located upon the actuator bar at a point such as will ensure full opening of the track doors by the time the main door reaches the maximum open position. With the stop 51 so located upon the actuator bar, opening movements of the main door 7 along an arc of 90° or less, for example, will not result in displacing the track doors from the fully closed position.

On the other hand, if the main door 7 is limited in its swinging movement toward the open position, so that it may not describe an 180° arc, the stop 51 will be fixed upon the actuator bar at a location closer to the closing stop 50, so that the available swinging movement of the main door may be utilized in moving the track doors to the fully open position.

By properly locating the stops along the slot portion of the actuator bar, proper opening and closing movements of the track doors may be ensured irrespective of the available swing of the main door. The operation of the device is extremely smooth and reliable, and the design of the actuating mechanism is such that no strain or binding may occur so as to injure the operating parts of the track door assembly and its actuating mechanism. The structure moreover is quite simple and inexpensive, and may be applied to existing coolers or other compartments with the use of simple tools in the hands of a relatively unskilled mechanic.

The advantages above mentioned are present also in the modified form of track door actuator illustrated by Fig. 5, wherein 65 indicates a bracket corresponding to that illustrated at 59, and which is to be fixedly mounted upon the main door near the axis of the main door hinge. This bracket may include a laterally extending arm 66 which is perforated at 67 to receive a vertical pin 68 that depends from a tubular slide member 69. The slide member pivots at its pin 68, and through it slidably extends the actuator rod 70, which in this case may be of round stock. Adjustable stops for performing the same function as stops 50 and 51 of Fig. 1, may be in the form of collars 71 and 72 applied to the rod at opposite sides of the slide member 69, the collars being furnished with means for adjustably fixing them to the rod. As herein disclosed, the securing means for the collars are in the form of set screws 73 threaded into the material of the collars, and having their butt ends engageable with the actuator rod. In this form of the device, it is unnecessary to slot the actuator element, as the longitudinally bored slide member 69 forms a perfect guide for the rod. At the pivotal end of the actuator rod there is fixed a suitable lug member 74 perforated as at 75 to receive a pivot pin whereby the actuator rod is pivotally mounted upon one of the track doors, in substantially the manner illustrated by Fig. 4. The free end of pivot pin 68 may be furnished with a nut or other locking device, if desirable or necessary, to preclude disassociation of the slide member 69 from its supporting bracket 65.

It is to be understood that various modifications and changes in the structural details of the device may be made, within the scope of the appended claim, without departing from the spirit of the invention.

What is claimed is:

In a refrigerator construction including a wall having a walk-in main door opening, a smaller auxiliary track door opening above the first-mentioned opening, a main door having an edge hinged along one vertical edge of the main door opening, and a pair of track doors hinged at opposite vertical sides of the track door opening, linkage means within the refrigerator connecting the track doors for corresponding opening and closing movements, a perforate lug extending outwardly from one of the track doors, an actuator bar having one end pivoted to the perforate lug of said one track door, said bar including a second end longitudinally slotted, a bracket fixed to the main door including a horizontal extension having an upper bearing face upon which the slotted end of the actuator bar may slide while being supported by said bearing face, an upright pivot member anchored to the main door bracket and passing through the slot of the actuator bar with clearance sufficient to ride lengthwise within the slot when the main door is swung about its hinge, a stop adjustably fixed within the slot of the actuator bar at one side of the pivot member, to engage the pivot member only when the main door is opened wider than required for human ingress and egress through the main door opening, and a second stop adjustably fixed within said slot at the opposite side of the pivot member, to be contacted by the pivot member whenever the main door and the track doors are fully closed.

CHASE BLUM.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
272,392	Wheeler	Feb. 13, 1883
744,552	How et al.	Nov. 17, 1903
988,265	Hart	Mar. 28, 1911
1,012,576	Ahrens	Dec. 26, 1911
1,072,600	Gillespie	Sept. 9, 1913
1,732,164	Jones	Oct. 15, 1929
1,941,969	Calabrese	Jan. 2, 1934
2,012,925	Fritz	Aug. 27, 1935
2,206,051	Roof	July 2, 1940
2,378,114	Van Donk	June 12, 1945

FOREIGN PATENTS

Number	Country	Date
203,186	Great Britain	Sept. 6, 1923