Feb. 24, 1953 W. G. KOCH 2,629,338

REFRIGERATOR CAR BRACING PANEL SYSTEM

Filed Jan. 6, 1949 5 Sheets-Sheet 1

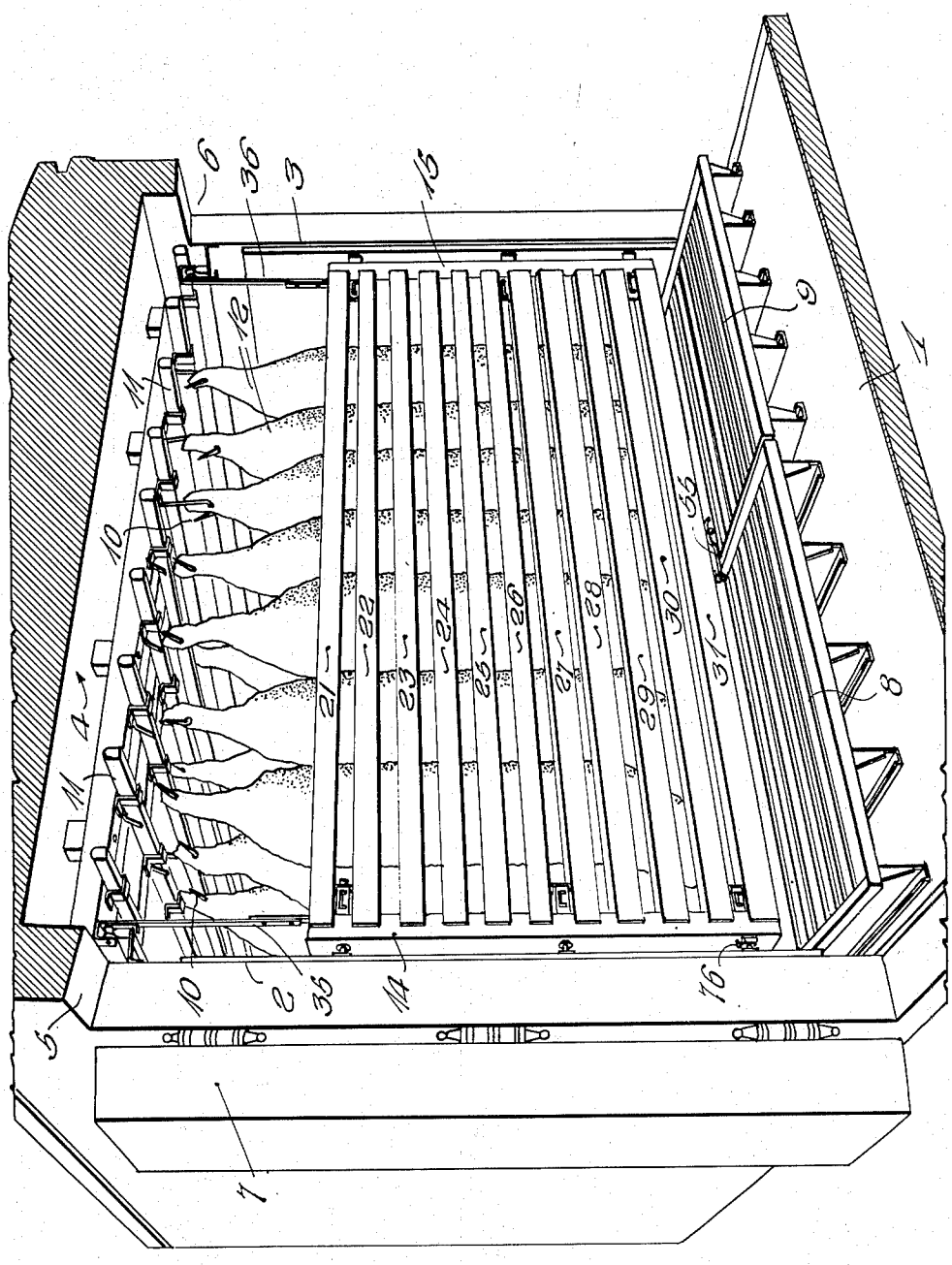

FIG. 1

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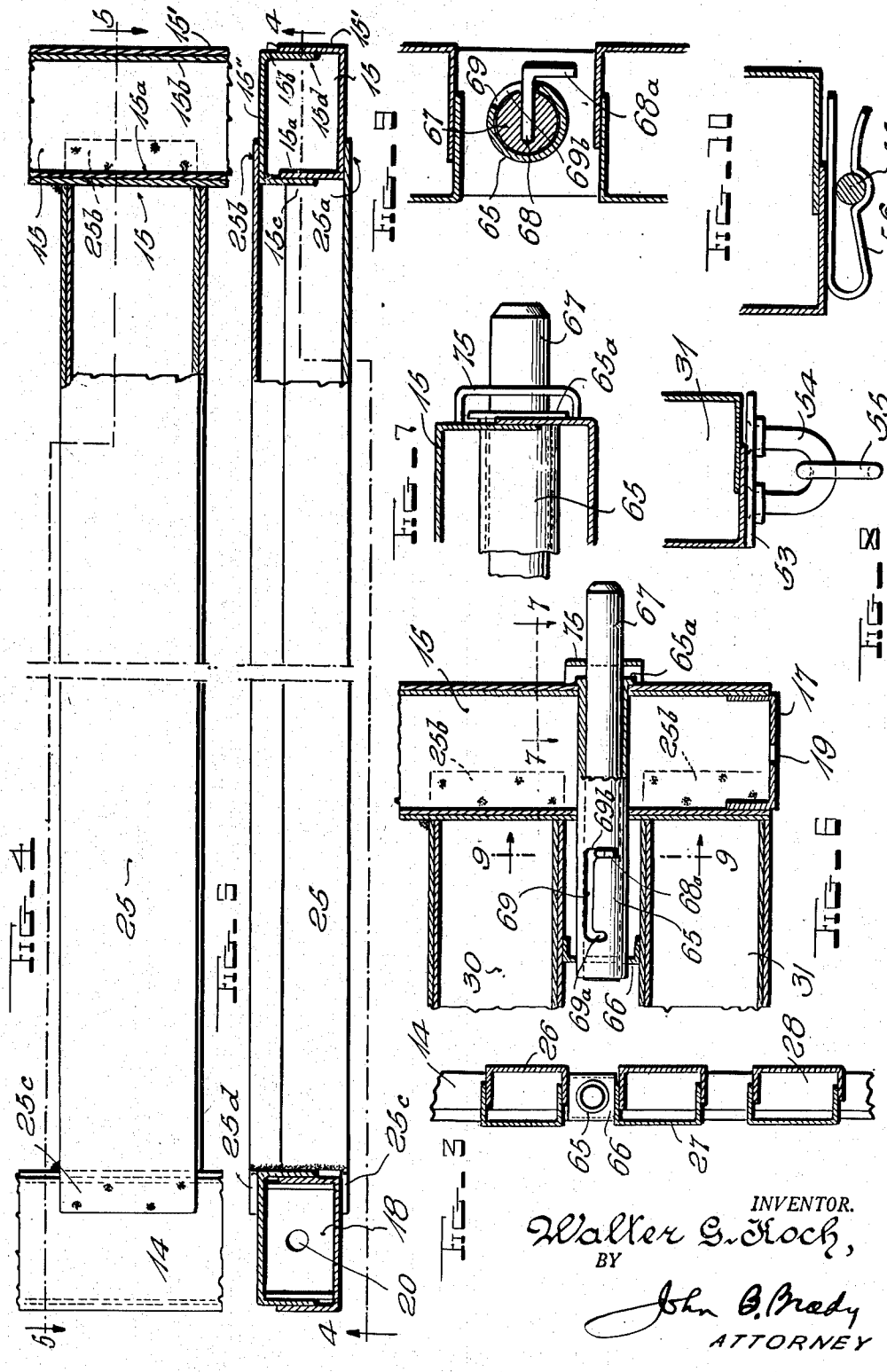

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REFRIGERATOR CAR BRACING PANEL SYSTEM

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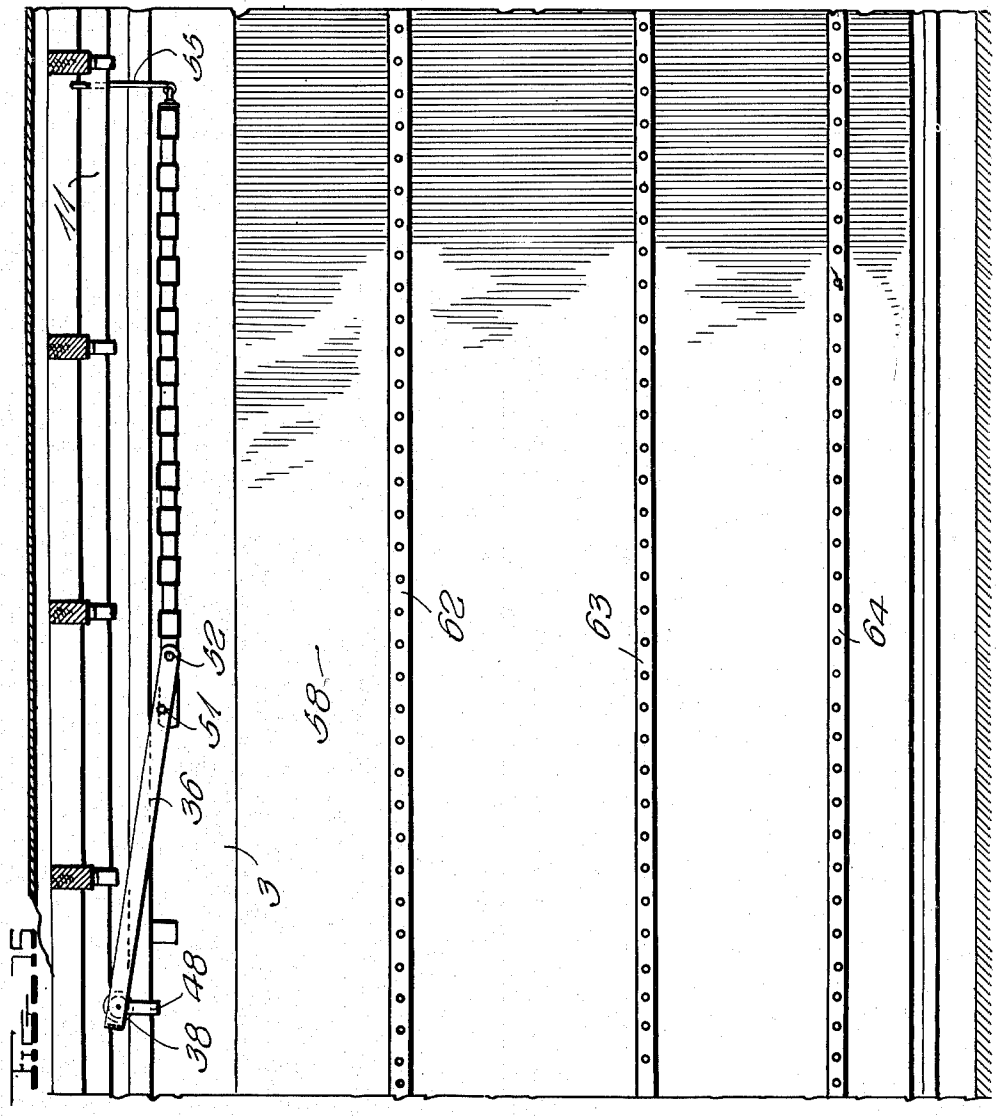

FIG. 15

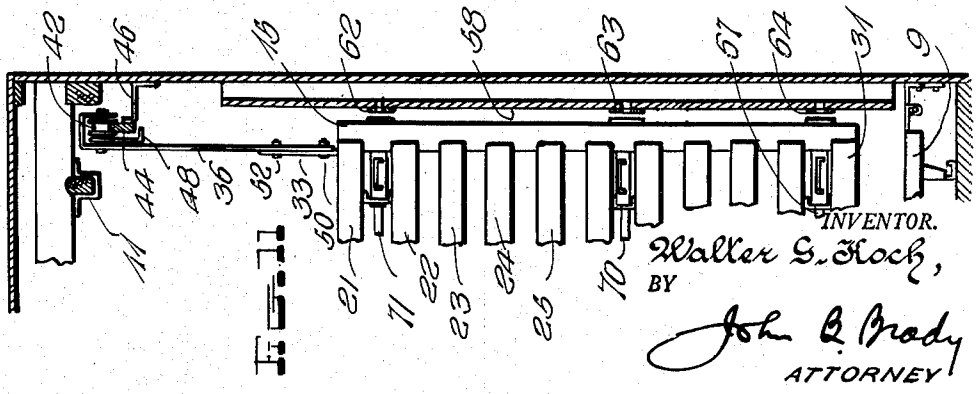

FIG. 11

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REFRIGERATOR CAR BRACING PANEL SYSTEM

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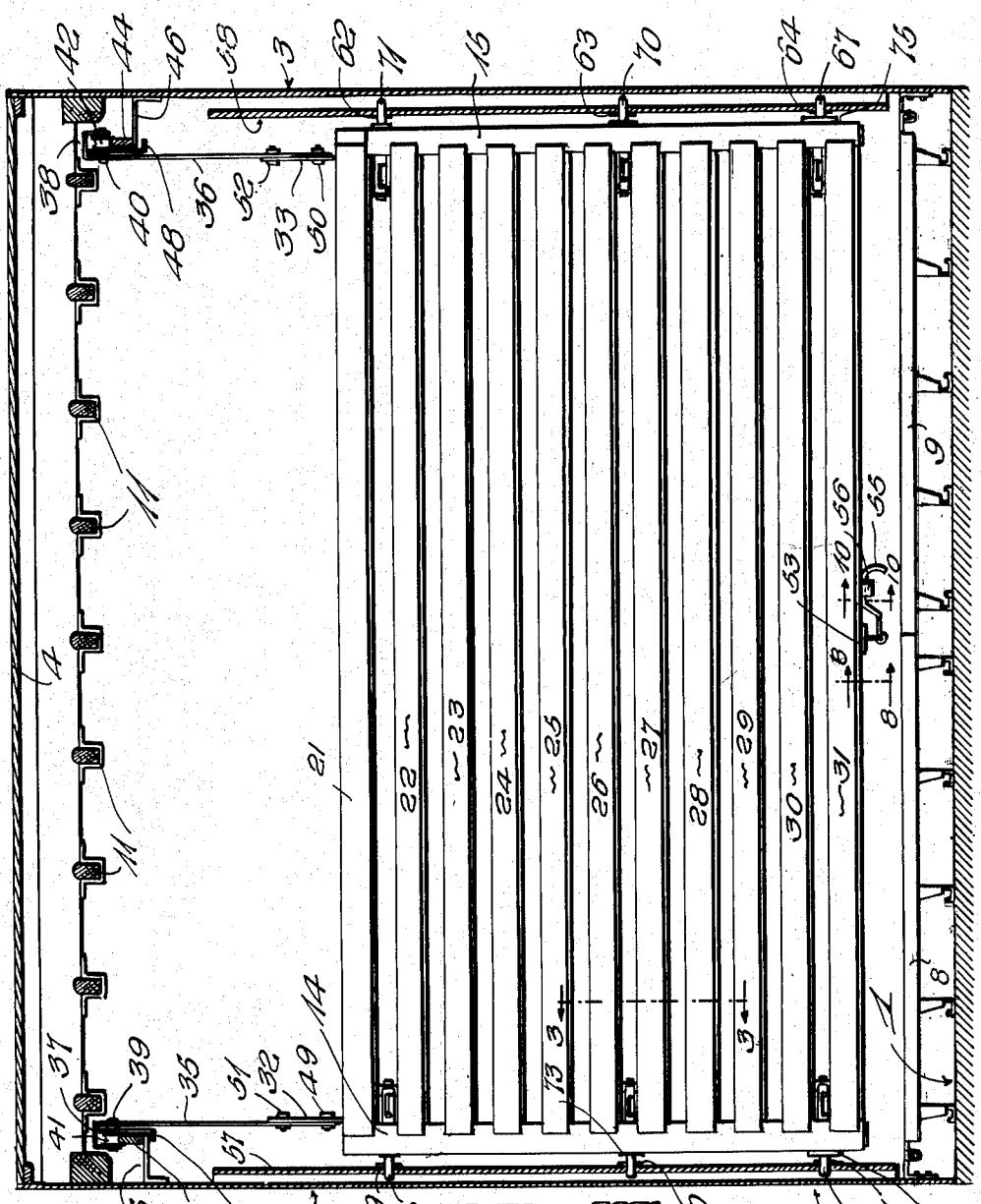

FIG. 2

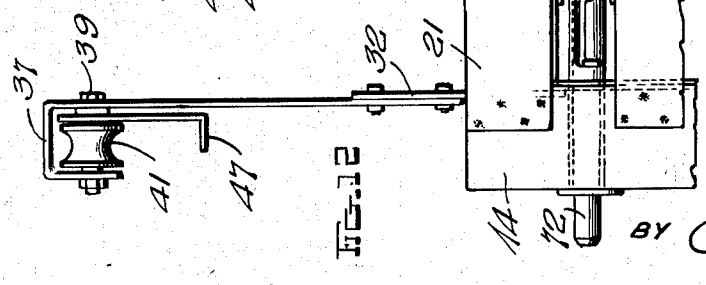

FIG. 12

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REFRIGERATOR CAR BRACING PANEL SYSTEM

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FIG. 13

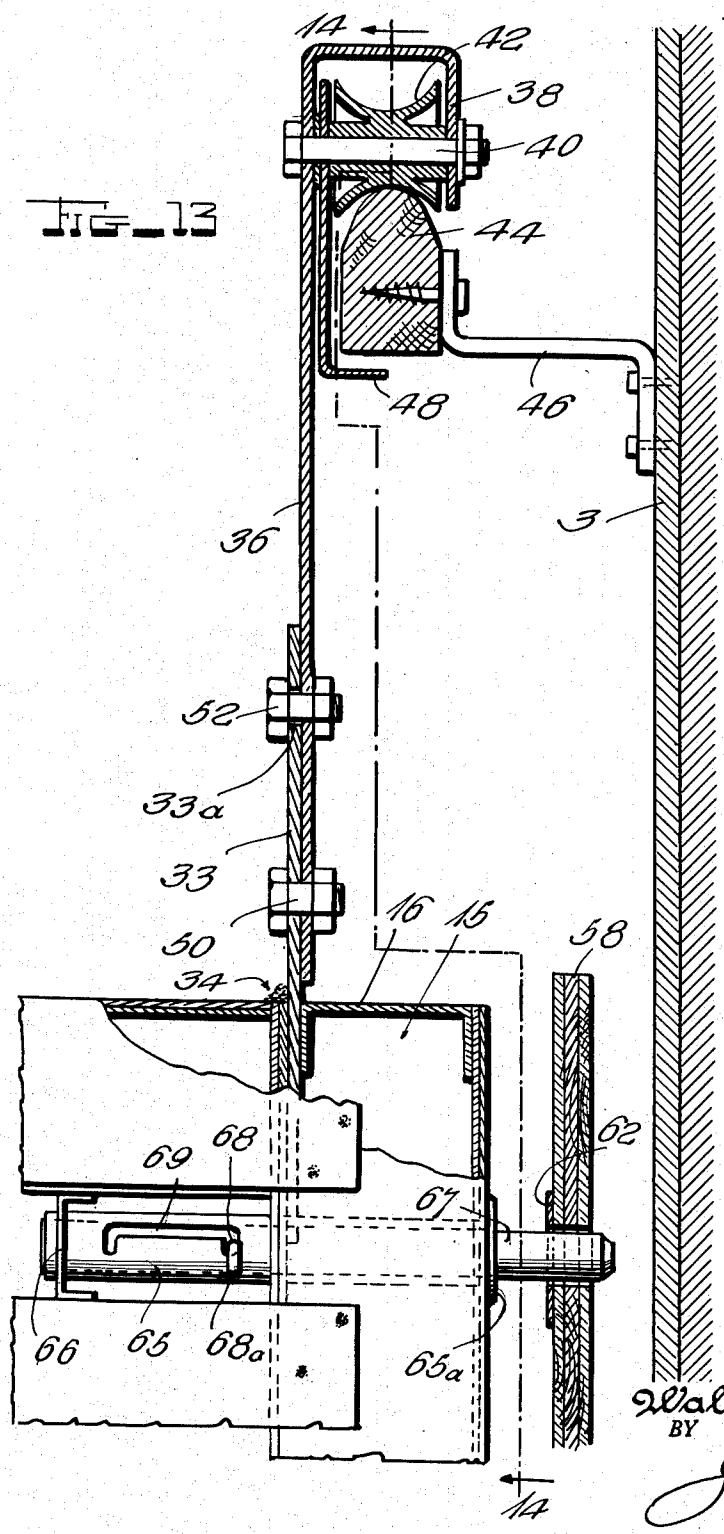
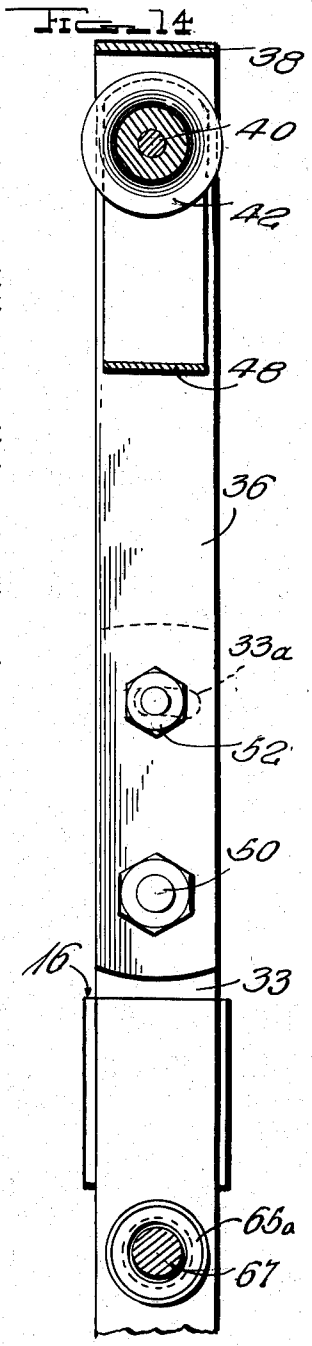


FIG. 14



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Patented Feb. 24, 1953

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UNITED STATES PATENT OFFICE

2,629,338

REFRIGERATOR CAR BRACING PANEL SYSTEM

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Application January 6, 1949, Serial No. 69,526

9 Claims. (Cl. 105—376)

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My invention relates broadly to transportation equipment, and more particularly to apparatus for facilitating shipment of perishable products in refrigerator cars.

One of the objects of my invention is to provide a construction of metallic fittings for refrigerator cars for facilitating the packing and transportation of perishable products.

Another object of my invention is to provide a construction of stainless steel hardware for installation in refrigerator cars for facilitating packing, protection, and transportation of goods such as meats, fruits, fresh vegetables, and other perishable products.

Still another object of my invention is to provide a construction of bracing panel for refrigerator cars which may be adjustably positioned transversely of a refrigerator car for partitioning and protecting food products such as meats, fruits, fresh vegetables, and other perishable goods during transportation.

A still further object of my invention is to provide a construction of stainless steel bracing panel for refrigerator cars which may be suspended interiorly of the car and selectively moved to a desired transverse position therein for rigidly packing a load within the car and preventing its dislodgement therein during transportation.

A still further object of my invention resides in a construction of hanger mechanism for suspending a transverse gate within a refrigerator car in a position in which the gate may be swung to a substantially horizontal position in the top of the refrigerator car for facilitating loading of the car and thereafter dropped to a vertical position for bracing the load within the car.

Other and further objects of my invention reside in the construction of light-weight metallic bracing panel and hardware fittings associated therewith, as set forth more fully in the specification hereinafter following by reference to the accompanying drawings, in which:

Figure 1 is a perspective view showing the bracing panel of my invention in position for bracing the load or cargo stored within the car; Fig. 2 is a front elevational view of the bracing panel in transverse position within the refrigerator car; Fig. 3 is a fragmentary vertical sectional view taken substantially on line 3—3 of Fig. 2, the view being enlarged to illustrate the detailed construction of the tubing forming the bracing panel; Fig. 4 is a fragmentary elevational view of one section of the metallic tubing from which the bracing panel is constructed, the view being partially broken away and illustrated in longitudinal section substantially on line 4—4 of Fig. 5; Fig. 5 is a horizontal sectional view taken substantially on line 5—5 of Fig. 4; Fig. 6 is an enlarged fragmentary vertical sectional view taken through one corner of the bottom of the bracing panel, with certain of the parts shown in elevation and illustrating particularly the condensate drain in the end of one of the vertical tubes forming the bracing panel; Fig. 7 is a fragmentary sectional view taken substantially on line 7—7 of Fig. 6 and illustrating particularly the mounting means for one of the retractible and extendible securing bolts; Fig. 8 is a fragmentary sectional view taken substantially on line 8—8 of Fig. 2 and showing the attachment means for the hook which serves to suspend the bracing panel in horizontal position above the load in the refrigerator car while loading or unloading the car; Fig. 9 is a fragmentary vertical sectional view taken substantially on line 9—9 of Fig. 6; Fig. 10 is a vertical sectional view taken substantially on line 10—10 of Fig. 2 and illustrating the clip for securing the hook in stowed position when the bracing panel is secured in transverse bracing position in the refrigerator car; Fig. 11 is a fragmentary elevational view showing the bracing panel moved to transverse position in the refrigerator car with the securing bolts in retracted position; Fig. 12 is a fragmentary view of the gate and one of the hangers thereof as illustrated in Fig. 11 but showing one of the securing bolts in projected position for maintaining the bracing panel in position relative to the side walls of the refrigerator car; Fig. 13 is an enlarged vertical sectional view through the hanger mechanism for suspending the bracing panel and showing particularly the means I provide for preventing withdrawal of the bracing panel from the car for precluding theft therein; Fig. 14 is a vertical sectional view taken substantially on line 14—14 of Fig. 13; and Fig. 15 shows the bracing panel in stowed position.

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My invention is directed to an improved hardware assembly which I have developed particularly for refrigerator cars and for facilitating the shipments of loads and cargoes generally of the perishable class such as meats, fruits, fresh vegetables and other perishable food products which must be moved to the market rapidly and preserved against injury incident to transportation. A particular feature of my invention is the provision of hardware for installation in refrigerator cars where the hardware is readily washable by a forced flow from an ordinary water hose.

I have found the equipment of my invention

highly practical in its construction and application, and while I have described herein one of the preferred embodiments of my invention, I realize that modifications may be made and I desire that the disclosure herein be understood in the illustrative sense and not in the limiting sense.

I provide a light-weight tubular bracing panel construction formed from stainless steel and so attached to the refrigerator car that it is not readily removable except by authorized persons with the use of proper tools for thereby preventing theft of the hardware. The bracing panel may be adjustably positioned along the length of the refrigerator car for partitioning the goods loaded into the car and bracing the goods against displacement or swinging movement incident to transportation. The bracing panel is provided with extensible and retractible bolts engageable in spaced sockets provided in strips extending longitudinally of the sides of the refrigerator car. The bracing panel is formed from tubing which may be cold rolled and spot seamed. The bracing panel has very substantial rigidity by reason of the hollow tubular construction thereof and special precaution is taken to release and discharge condensate which may collect interiorly of the tubes forming the panel. I provide special suspension hardware for the panel which enables the panel to be suspended on rollers engaging rails disposed longitudinally of the top of the car for readily adjusting the bracing panel to the desired lateral position along the car. The hangers are so constructed as will readily permit the swinging of the panel bracing to a substantially unobstructing position during loading and unloading operations.

Referring to the drawings in detail, reference character 1 designates the floor structure of a refrigerator car having side walls 2 and 3 closed by a ceiling structure 4. The conventional refrigerator car is illustrated in Fig. 1 as having centrally arranged side openings represented at 5 and 6 adapted to be closed by the doors at each side of the refrigerator car as represented for example by the swinging door 7. I have shown the refrigerator car equipped with floor racks represented at 8 and 9 which extend substantially the width of the refrigerator car terminating end to end. These floor racks are formed from stainless steel and are readily washable and maintained in sanitary condition. The floor racks may support certain of the loads such as stacks of bellies of bacon or steaks. Such loads may be stacked beneath the meats which are suspended on hooks as represented for example in Fig. 1 at 10 engaged over longitudinally extending rails 11 at the top of the refrigerator car and hooking into the carcasses or sides of meat represented at 12. Each carcass of this meat 12 weighs of the order of 250 pounds and is pendantly suspended from the top of the refrigerator car. It will therefore be apparent that it is very important to suppress the swinging movement of this pendant mass which may result from a rough road-bed in rail transportation. All contact with the meat, however, must be by means having a high degree of sanitation and my development has met these problems in a very effective manner.

Each bracing panel is formed by two vertically extending stainless steel tubes shown at 14 and 15. The tubes are each formed by a pair of channels having their sides seamed together forming a tube of substantially rectangular contour. In Figs. 4 and 5 the construction of the tubes has been clarified by showing the sides 15*a* and 15*b* of one channel-shaped section 15′ connected with the sides 15*c* and 15*d* of the complementary channel-shaped section 15″ forming by their conjoint relationship the closed seamed tube 15. The structure of tube 14 is similar to the tube 15 as described. These tubes are closed at the top by a capping member represented in Fig. 13 at 16 and at the bottom each of the tubes is provided with a perforated closure member represented at 17 in Fig. 6 and at 18 in Fig. 5. Closure plate 17 is perforated at 19 while closure plate 18 is perforated at 20. These perforations release and discharge condensate which may collect in the hollow vertical tubes 15 and 14.

The bracing panel is made up of a multiplicity of spaced stainless steel tubes of substantially rectangular contour which I have represented at 21, 22, 23, 24, 25, 26, 27, 28, 29, 30 and 31. These stainless steel tubes are represented more clearly in Figs. 4 and 5. Stainless steel tube 25 has been illustrated as typical of the tubes 21–31. Each tube is formed similar to the tubes 14 and 15, i. e., a pair of channel-shaped portions have their sides overlapping one with respect to the other and seamed or butt welded. The sides of the tube 25 project beyond the upper and lower edges thereof as represented at 25*a* and 25*b* at one end and at 25*c* and 25*d* at the other end and overlap the sides of the vertically extending tubular members 15 and 14. These overlapped projections are spotwelded to the vertically extending tubes 15 and 14. Then the upper and lower edges of the transversely extending tubes are welded to the vertically extending tubes 15 and 14 and provide a sanitary type joint, preventing the secretion of dirt and foreign matter and ensuring a sanitary condition of the bracing panels at all times. The edges of the tubes 25 are either overlapped and spotwelded or butt welded. In showing the overlapped construction I have somewhat exaggerated the amount of the overlap and it will be understood that anly a relatively small amount of overlap is necessary.

The stainless steel tubings 21–31 are spaced one from the other along the vertical lengths of the tubes 14 and 15 for a distance approximately one-half the width of the horizontally disposed tubes which results in a light-weight construction which has very substantial rigidity. The bracing panel or gate thus formed is a structural unit which is suspended from the top of the refrigerator car. This suspension is accomplished by a pair of spaced hangers comprising vertically extending stainless steel bars 32 and 33. The bars 32 and 33 are welded to the interior of the vertically extending tubes 14 and 15 as represented for example at 34 in Fig. 13. The bar extends interiorly of the upper end of each tube for a distance sufficient to form a secure spotweld to the tube. The cap represented at 16 which closes the upper end of the vertically extending tube fits directly against the suspension bar. Each suspension bar forms a connecting means for a link 35 and 36 which extends from the roller carrier 37 and 38. Each roller carrier 37 and 38 has a bolt member 39 and 40 extending transversely therethrough forming a journal for roller members 41 and 42. Roller members 41 and 42 engage the longitudinally extending rails 43 and 44 which are supported on brackets 45 and 46 se-

cured to the opposite sides of the refrigerator car. A protective device in the form of an angle member 47 and 48 depends downwardly from bolt member 40 and projects beneath the coacting rail as represented more clearly in Fig. 13. Thus it will be seen that once assembled in position the roller member 42 cannot be removed from the rail 44 by reason of the obstruction offered by the member 48 projecting beneath the rail 44. Theft of the bracing panel assembly is thereby prevented.

It is particularly important to note and observe the manner of connecting links 35 and 36 with suspension bars 32 and 33. The bolts 49 and 50 extend through the overlapping ends of links 35 and 36 and the suspension bars 32 and 33. The upper extremities of the suspension bars 32 and 33 include arcuate shaped slots adjacent the upper extremities thereof as represented for example at 33a in Figs. 13 and 14. Bolt members 51 and 52 extend through the arcuate shaped slots adjacent the upper ends of suspension bars 32 and 33 respectively and pass through the links 35 and 36 for providing an inter-connection between the bracing panel assembly and the links capable of limited lost motion necessary in moving the bracing panel assembly to the stowed or upper horizontal position shown in Fig. 12 during the loading and unloading operation. The bottom of the bracing panel constituted by tube 31 has a plate member 53 secured thereto as shown more clearly in Fig. 8 with a depending loop 54 supported thereby and forming a connecting means for the hook 55. The hook 55 includes an elongated loop portion adapted to be engaged over one of the rails 11 when the panel is raised to stowed position as represented in Fig. 15. Whenever the bracing panel is moved to operative position transversely of the refrigerator car as represented in Fig. 2 the hook 55 is clipped as represented in Fig. 10 in the retainer clip 56 secured to the bottom of the bracing panel.

The refrigerator car within which the bracing panel operates is equipped on each of the side walls 2 and 3 thereof with facing surfaces 57 and 58 along which longitudinally extending strips are installed. The longitudinally extending strips installed along the facing surface 57 are represented at 59, 60 and 61. The longitudinally extending strips installed along facing surface 58 are represented at 62, 63 and 64. These longitudinally extending strips are formed from stainless steel and are spaced one from the other through vertical distances in alignment with retractible and extendible bolts carried by opposite ends of the bracing panel. The sets of strips are provided with socket openings in substantial vertical alignment to permit the entry of extendible and retractible bolts from the ends of the bracing panel for maintaining the bracing panel in a selected rigid position within the refrigerator car.

The construction of the securing bolts is illustrated more clearly in Figs. 6, 7, 9, 11–14 from which it will be seen that the cylindrical sleeve or barrel members 65 are disposed in the spaces between the tubular members represented for example in Fig. 6 at 30—31. The sleeve or barrel 65 is rigidly supported between the spaced tubular members 30 and 31 by a channel-shaped spacer 66 and extends through the vertical extending tubular member represented at 15 and is secured at the end thereof by means of flange 65a which connects with the exterior end surface of the tubular member 15. The sleeve 65 forms a housing for the projectable and retractible bolt 67

which is guided therein by means of pin 68 and projects radially through longitudinally extending slot 69 in sleeve 65. The slot 69 is bayonetted at each end thereof as represented at 69a and 69b in Fig. 6 to permit the latching of bolt 67 in either retracted or projected position by a slight twist of the bolt as represented more particularly in Fig. 9. The pin 68 is provided with an angularly disposed handle 68a to enable the bolt 67 to be readily controlled by the fingers of the operator. Three of the retractible and extendible bolts are provided at each end of the bracing panel in spaced relation corresponding to the spaced positions of the socket openings in the strips 59, 60 and 61 adjacent one wall of the car and strips 62, 63 and 64 adjacent the opposite wall of the car. The retractible and extendible bolts are designated in Fig. 2 at 67, 70, 71, 72, 73 and 74. As the bracing panel is aligned with the socket openings in the opposite strips the bolts are angularly shifted to latched retracted position and moved outwardly to enter the socket openings in the several strips and then angularly shifted to latch the bolts in their projected positions, thus maintaining the bracing panel in selected position within the refrigerator car. Fig. 11 shows the bolts 67, 70 and 71 in their retracted position freeing the bracing panel for selective adjustment within the car or for swinging movement to a stowed position as represented in Fig. 15.

In order to reinforce the lower bolts 67 and 74 adjacent the bottom of the bracing panel which is subject to considerable strain and stress I provide additional reinforcement for these bolts as represented in Figs. 6 and 7 by applying a transversely extending strip member 75 and 76 to the ends of the vertically extending tubes 15 and 14 and spaced therefrom and provided with openings through which the bolts 67 and 74 may slide.

The bracing panel is, for all practical purposes, permanently attached to the refrigerator car and is not subject to ready removal therefrom. Several such bracing panels may be employed between rows of downwardly depending carcasses and the carcasses thereby clamped and restrained, preventing bruising of the meat.

The fact that the metal structure of the bracing panel is formed from stainless steel permits the washing of the parts by forced flow of water from a hose or by steam, so that sanitary transportation conditions may be assured. The joints and connections of the parts are such that accumulation of particles from the food products may be readily washed away.

I have found the structure of my invention highly practical and successful in operation and while I have described my invention in one of its preferred embodiments I realize that modifications may be made and I desire that it be understood that no limitations upon my invention are intended other than may be imposed by the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is as follows:

1. In a structure of the class described, a bracing panel formed by a multiplicity of spaced parallel extending tubular members, means for suspending said bracing panel in a position adjacent the top of an enclosing wall structure for adjustable movement transversely thereof in position for bracing material stored within the enclosing wall structure, a multiplicity of projectable and retractible pintles disposed between certain of said parallel extending members and carried by opposite ends of said bracing panel and projectable

into and retractible from aligned socket openings in the sides of the enclosing wall structure, said bracing panel having the spaced parallel extending tubular members thereof interconnected by vertically extending hollow tubular members of substantially rectangular section, the vertically extending hollow tubular members each enclosing a substantially dead air column having a height substantially equal to the height of the bracing panel and each being provided with drainage openings adjacent the bottom thereof for the release of condensate which may accumulate on the interior walls of said vertically disposed hollow tubular members.

2. In a structure of the class described, a bracing panel, suspension bars extending from positions adjacent opposite ends from said bracing panel, links pivotally connected with said bars and angularly movable with respect thereto, limiting means extending through said bars and links above the pivotal connections thereof for restricting the angular movement of said links, roller members journaled on said links and engageable with rail members supported longitudinally above said bracing panel for suspending said bracing panel from a position adjacent the top of an enclosing wall structure for adjusting said bracing panel transversely of the enclosing wall structure for the selective positioning thereof and facilitating the angular movement thereof to a stowed substantially horizontal position.

3. In a structure of the class described, a bracing panel, means for suspending said bracing panel from a position adjacent the top of an enclosing wall structure, said means including longitudinally extending rail members fixed with respect to said enclosing wall structure, roller members engaging said rail members, links connected with said bracing panel and pivoted about the pivotal axis of said roller members and permitting adjustment of said bracing panel transversely of the enclosing wall structure for the selective positioning thereof, and a confining angle member pivotally mounted on the journaling means for each of said roller members and gravitationally depending therefrom with a portion of the angle member extending beneath the coacting rail member for interlocking said bracing panel with respect to said rail members.

4. In a structure of the class described, a bracing panel, means for suspending said bracing panel from a position adjacent the top of an enclosing wall structure, said means including longitudinally extending rail members fixed with respect to the enclosing wall structure, and roller members engaging said rail members and connected with said bracing panel for adjusting said bracing panel transversely of the enclosing wall structure for the selective positioning thereof, the connections between said roller members and said bracing panel including two pairs of flat overlapping strip members disposed in planes transverse to the plane of the bracing panel, one pair of strip members depending from said roller members and the other pair of strip members projecting upwardly from opposite ends of said bracing panel and an angularly shiftable lost motion pivotal connection between said strip members for facilitating the movement of said bracing panel from a substantially vertical transverse position within said enclosing wall structure to a substantially horizontal stowed position adjacent the top of said enclosing wall structure.

5. In a structure of the class described, a bracing panel, means for suspending said bracing panel from a position adjacent the top of an enclosing wall structure, said means including longitudinally extending rail members fixed with respect to the enclosing wall structure, roller members engaging said rail members and connecting with said bracing panel for adjusting said bracing panel transversely of the enclosing wall structure for the selective positioning thereof, the connections between said roller members and said bracing panel including angularly shiftable lost motion depending bars permitting relative angular displacement of the bracing panel with respect to said roller members for facilitating the movement of said bracing panel from a substantially vertical transverse position within the enclosing wall structure to a substantially horizontal stowed position adjacent the top of said enclosing wall structure, with said bracing panel shifted out of coplanar alignment with the connections with said roller members.

6. A bracing panel formed by a pair of vertically extending rectangular tubular members, spaced from each other in coplanar relation, each of said tubular members being formed by a pair of coacting channels having overlapping side flanges directed toward and secured to each other with the webs thereof extending in spaced substantially parallel planes, and a multiplicity of spaced parallel extending horizontally disposed channel members with the opposite ends of the flanges thereof recessed for receiving said vertically extending tubular members and with extensions of the webs thereof overlapping the vertically disposed rectangular tubular members and secured thereto and the flanges of said horizontally disposed channel members overlapping each other and secured in horizontally seamed relation.

7. A bracing panel formed by a pair of vertically extending rectangular tubular members spaced from each other in coplanar relation, each of said tubular members being formed by a pair of coacting channels having overlapping flanges directed toward and secured to each other in combination with a multiplicity of coacting spaced parallel extending horizontal channel members with the opposite ends of the flanges of the channel members recessed and receiving said vertically extending tubular members with extensions of the webs thereof overlapping the vertically disposed rectangular tubular members and secured thereto and the webs of said coacting channels overlapping each other and secured in horizontally seamed relation, horizontally disposed tubular members disposed in opposite flanges of said vertically extending rectangular tubular members, projectable and retractible pintles extending transversely through said horizontally disposed tubular members and between certain of said horizontal channel members, and means supported by said vertically extending rectangular tubular members for guiding said projectable and retractible pintles from positions housed substantially within said horizontally disposed tubular members to positions extending beyond said vertically extending rectangular tubular members.

8. A bracing panel formed by a pair of vertically extending tubular members spaced from each other in coplanar relation, a multiplicity of coacting spaced parallel transversely extending tubular members interconnecting said vertically extending tubular members, upwardly extending hangers connected with the upper ends of said vertically extending tubular members adjacent the top transversely extending tubular members, a pair of longitudinally extending rails, link members

having the upper ends thereof turned over upon themselves above said rails, roller members journaled in the said turned over portions of said links and engaging said rails, the depending ends of said links being pivotally connected at their lower extremities with said hangers in a position adjacent the upper transversely extending member of said bracing panel, the upper extremities of said hangers having arcuate slots formed therein and fastening means extending through said links and through the arcuate slots in said hangers for interconnecting said links and hangers for allowing restricted angular displacement of said hangers with respect to said links as said bracing panel is moved from a substantially vertical plane to a horizontal plane about said roller members as centers with said brace panel displaced from coplanar alignment with the journals between the turned over portions of said links and said roller member.

9. A bracing panel formed by a pair of vertically extending rectangular tubular members spaced from each other in coplanar relation, each of said tubular members being formed by a pair of coacting channels having overlapping flanges directed toward and secured to each other, in combination with a multiplicity of coacting spaced parallel extending horizontal channel members with the opposite ends of their flanges recessed and receiving said vertically extending rectangular tubular members and with the webs thereof overlapping the vertically disposed rectangular tubular members and secured thereto and the webs of said coacting channels overlapping each other and secured in horizontally seamed relation, horizontally disposed tubular

members extending through opposite flanges of said vertically disposed tubular members, a channel-shaped spacer extending between the aforesaid horizontally disposed channel members and forming mounting means for the interior ends of said horizontally disposed tubular members, projectable and retractible pintles extending transversely through said horizontally disposed tubular members and between certain of said horizontally disposed channel members, and external means supported by said vertically disposed rectangular tubular members for guiding said projectable and retractible pintles from positions housed substantially within said horizontally disposed tubular members to positions extending beyond said horizontally disposed tubular members.

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