

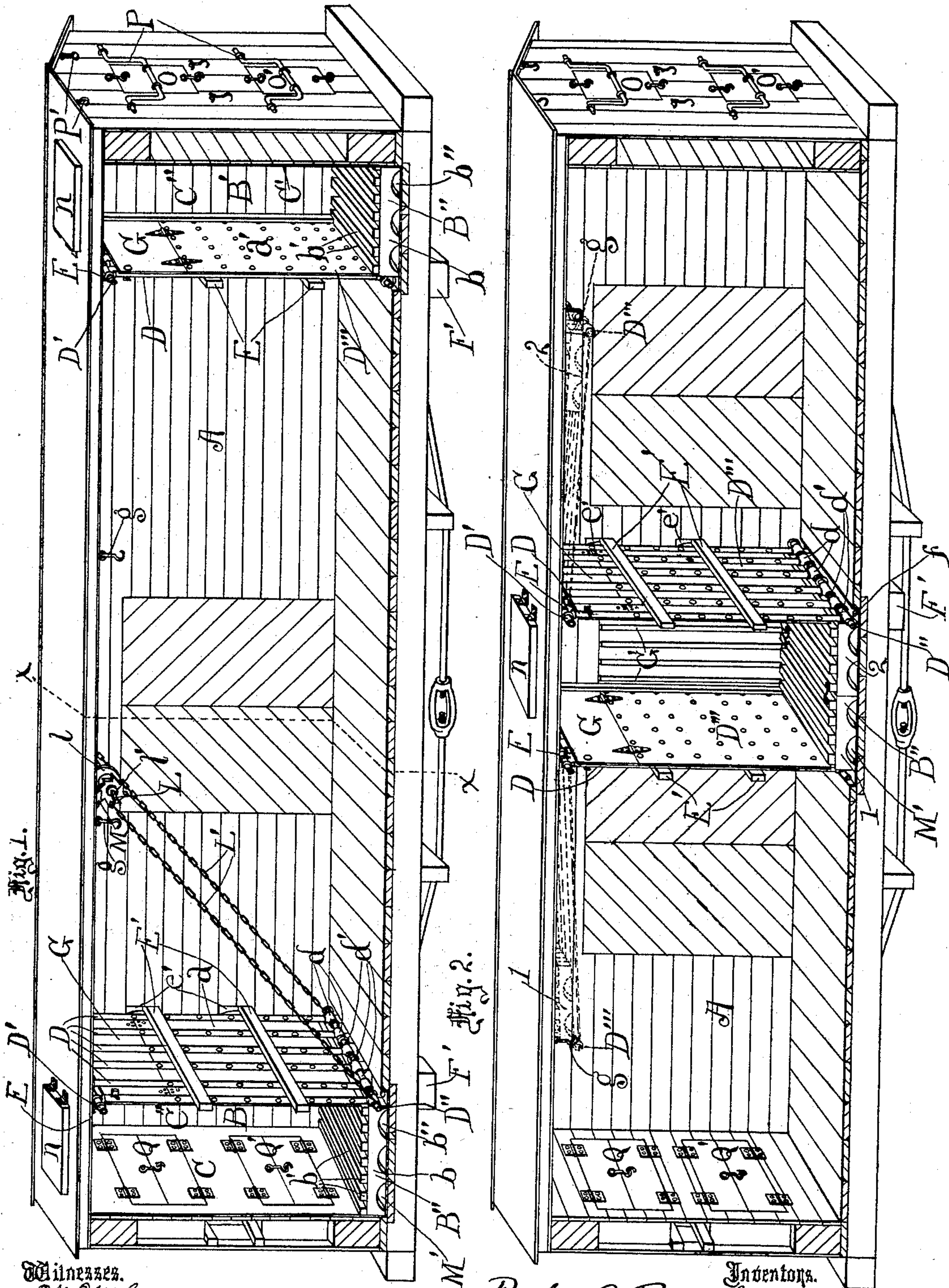
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P. A. BARKER & F. A. REYNOLDS.
REFRIGERATOR CAR.

No. 509,836.

Patented Nov. 28, 1893

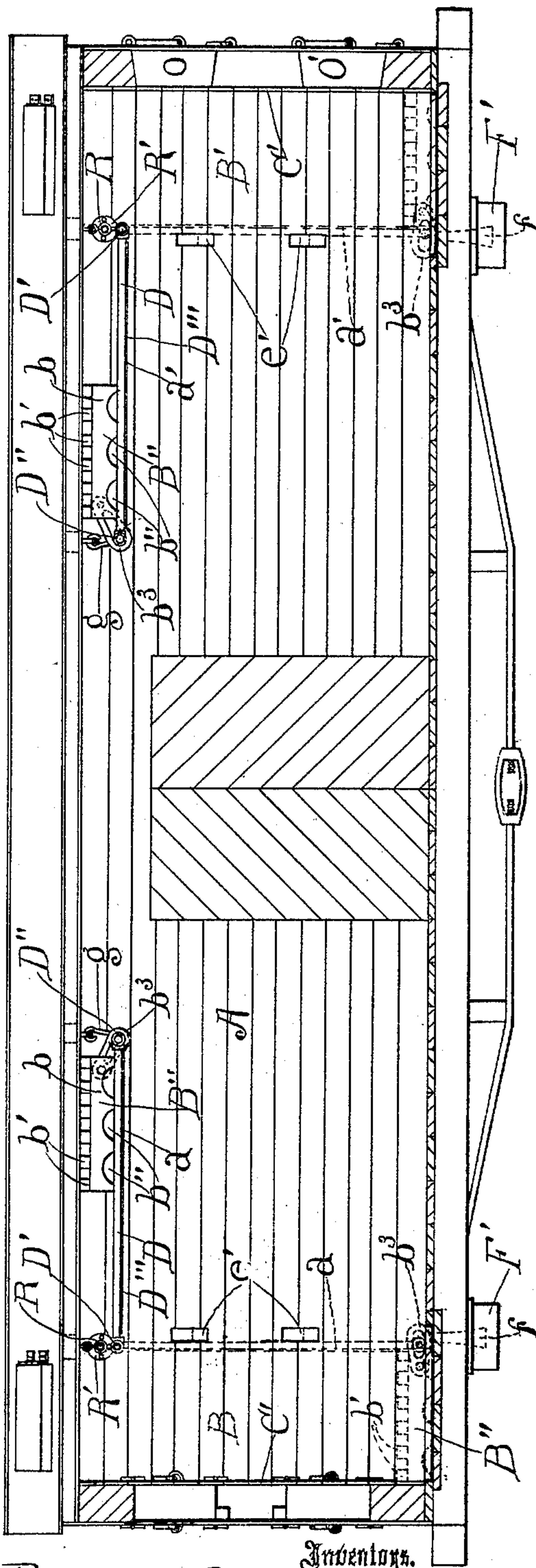


Witnesses.
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Inventors.
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by Hazard & Townsend
their Attys

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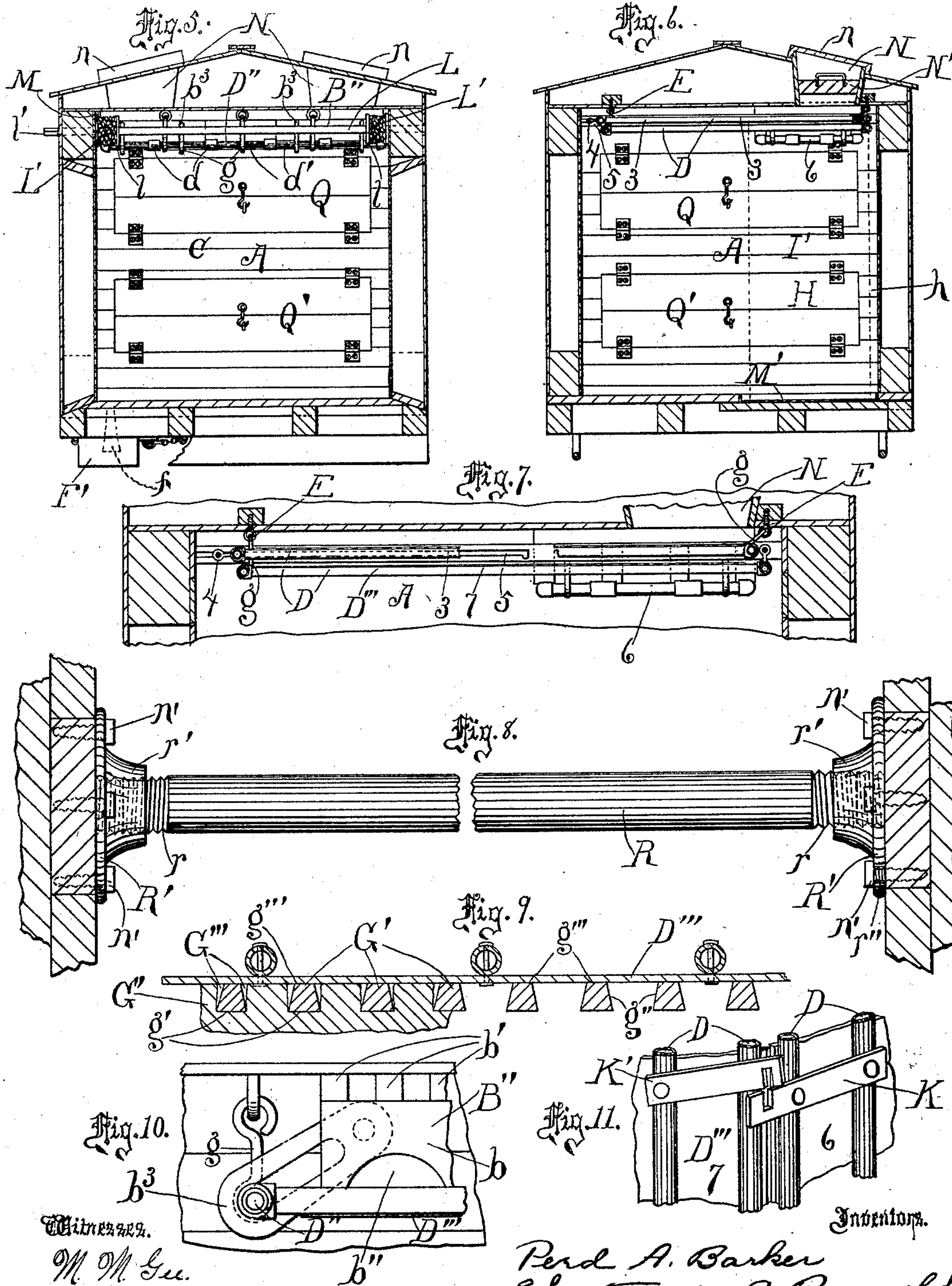
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UNITED STATES PATENT OFFICE.

PERD A. BARKER AND FRED A. REYNOLDS, OF LOS ANGELES, ASSIGNORS
TO CHARLES SAUNDERS HARDY, OF SAN DIEGO, CALIFORNIA.

REFRIGERATOR-CAR.

SPECIFICATION forming part of Letters Patent No. 509,836, dated November 28, 1893.

Application filed December 12, 1892. Serial No. 454,812. (No model.)

To all whom it may concern:

Be it known that we, PERD A. BARKER and FRED A. REYNOLDS, citizens of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Refrigerator-Cars, of which the following is a specification.

In shipping meats great distances it is necessary to provide refrigerator cars with commodious ice boxes in order to give capacity for sufficient ice to allow the car to be sidetracked or delayed in transit without great liability of the ice all melting and allowing the contents of the car to spoil from too high temperature. It is ordinarily the case that shipments in which refrigeration is employed are made in but one direction at the same season and the car is returned empty, or loaded with other freight which does not require refrigeration. The ice boxes necessarily being large, have heretofore been built integral with the car. This takes up a large portion of the available shipping space of the car which could be utilized to great advantage in shipping a cargo of fruit and imperishable merchandise. In many instances the space remaining for shipment of return freight is too small to accommodate bulky freight so that the cars are returned empty for the subsequent loads of meats, thus greatly increasing the cost of transportation, since higher rates must be charged to cover the expense of returning the car.

It has been found in practice that shipments of fruit from California can be made to the best advantage in insulated cars and it has been the practice to use for that purpose refrigerator cars in which meat has been shipped to California from the East and the superiority of refrigerator cars for shipments of fruit has been found to be so great that such cars have been returned empty from the East when no cargoes of meat could be obtained for the return trip.

Refrigerator cars, as vehicles for ordinary freight are very expensive and sometimes impracticable because of their cumbersome structure and restricted interior and contracted entrances, and it therefore occurs that

when there are no fruit shipments to be made the refrigerator cars will accumulate at the fruit shipping end of the route awaiting the fruit season for profitable return and when the fruit season is on, the demand for cars is so great that they have to be returned from the East empty and very frequently this transpires at times when there is a scarcity of ordinary cars for a character of freight which the refrigerator car will not accommodate. Furthermore the superiority of the refrigerator car as a vehicle for fruits does not result from the refrigeration but from the insulation and the ventilation, so that the space occupied by the ice boxes of the refrigerator car might be employed to accommodate the fruit if such boxes were not necessitated by the desirability of using the car at times as a refrigerator car.

The object of our invention is to provide a novel simple construction which can be conveniently adjusted to form the ice box or chest or folded to leave the interior of the car practically unobstructed, and the invention consists in the special constructions and combinations of parts hereinafter described and pointed out in the claims.

The accompanying drawings illustrate our invention.

Figure 1 is a sectional perspective view of a car embodying our invention. One side of the car is removed to show the arrangement of parts. In this view the ice boxes are arranged at the ends of the car and are shown ready to receive the ice. Fig. 2 is a like view showing the ice box arranged at the middle of the car. Fig. 3 is a like view showing two small ice boxes arranged intermediate the ends of the car, leaving a passage way upon one side of each ice box. The boxes are shown in solid lines one folded and the other unfolded. Dotted lines in each instance show the parts in their opposite position. Fig. 4 is a sectional side elevation of a car having the ice box partitions arranged at the ends. Solid lines show the ice box partitions in their folded position, leaving the car in condition to receive a full load of fruit or other merchandise. Dotted lines indicate the partitions in position to convert the car into a refrigerator

car. Fig. 5 is a sectional view on line $x-x$ Fig. 1 looking toward the left and showing the partitions elevated. Fig. 6 is a sectional view on line $y-y$ Fig. 3 looking toward the left and showing the partitions elevated. Dotted lines indicate the outline of the ice box when arranged to receive the ice. Fig. 7 is a fragmentary enlarged view of a portion of Fig. 6 illustrating the arrangement of parts of the ice boxes shown in Fig. 3 when the same are folded out of the way. Fragments of the car are shown in section. Fig. 8 is a fragmentary view of our adjustable supporting beam, with the adjusting plates secured to the walls of the car. Fig. 9 is a fragmentary sectional view of the wall of the ice box to illustrate the improved ice supporting cleat. Fig. 10 is a detail of the manner of attaching the ice rack to the partition. Fig. 11 is a detail of the means we employ for securing the walls of the ice boxes shown in Fig. 3 to each other.

In the drawings A represents the car which is constructed as customary in refrigerator cars, with the exception of the ice boxes.

In Figs. 1 and 4, B B' indicate the ice boxes arranged in the end of the car.

$a a'$ indicate the ice box partitions hinged or otherwise secured to the interior of the car and arranged to be swung transverse the car at a distance from the end of the car to form the inner side wall of the ice box.

B'' indicates the removable ice rack hinged or otherwise secured to the partition and arranged to fold upon such hinged partition.

C, C' and C'' indicate the end and side walls of the car, adapted to form the other side and the two end walls of the ice box.

Suitable means for securing the partition in place to form an ice box when desired, are provided and suitable means for retaining the partition in its folded position when it is desired to use the car as an ordinary freight or fruit car are also provided. These are hereinafter described.

As illustrated the swinging wall of the ice box is formed of sheathing D''' of sheet metal or other suitable material secured to tubular uprights D connected at each end by T joints d and intermediate connecting tubular members d' . The tubular connections d' and T joints d constitute beams which serve as the upper and lower transverse wall beams D' D''. The walls in all the figures shown are of similar construction and are designated by the same letters and numerals of reference. The upper transverse wall beam D' as illustrated in Figs. 1, 2 and 5 is secured to the ceiling of the car, by means of eye bolts and links E fixed to the roof of the car and encircling the intermediate members d' of the wall beams. The means we consider preferable for this purpose however are shown in Figs 4 and 8 and are hereinafter fully described.

The means we employ for securing the partition or ice box wall against outward movement when the ice box is full of ice consist of the wall supporting cross bars E' arranged

intermediate the upper and lower transverse wall beams D' D'' and having their ends resting in sockets e' in the side of the car.

The ice rack B'' may be of any desired construction; but as shown it comprises the sills or floor joist b and the rack bars b' secured thereto; suitable openings b'' are provided in the bottom of the sills to allow the free passage of water in the drip pan to the outlet pipe f , (shown only in dotted lines.) This outlet pipe is sealed against the entrance of air into the car in the usual manner, i. e., the over-flow pan F' is arranged below the car and the outlet pipe f is arranged with its mouth below the top of the over-flow pan so that the lower end of the outlet pipe is below the surface of the water in the over-flow pan.

A suitable door G is provided in each partition to allow access to the ice box from the interior of the car.

In Fig. 2 the ice rack B'' is shown in two sections 1 and 2. Each section is hinged to its respective side wall of the ice box and arranged to be folded upon the outer side of such wall so that when the walls are elevated as indicated in dotted lines, the ice rack will be upon the top of the wall out of the way. When the side walls are elevated they are secured in their elevated position by suitable means, such as the hooks g secured to the ceiling of the car and arranged to hook upon the lower transverse wall beam D''.

The means for hinging the ice rack to the side wall of the ice box may consist of the links b^3 secured to the sills and encircling the lower beam D''.

It will be understood that the drip pans M' of the ice boxes are built with the car and remain in position when the side walls of the ice box are folded out of the way.

It sometimes occurs that a smaller quantity of ice will produce the required result in preserving the meat during shipment. Furthermore, it is desirable to arrange the ice boxes so that the air may be cooled equally in all parts of the car. In Fig. 3 we have shown an arrangement of the ice boxes adapted to attain this end. For convenience of illustration, we will designate the two boxes by the letters H and H'. Dotted lines indicate the box H as unfolded and solid lines show it folded against the ceiling of the car. The other box H' is shown reverse, i. e., dotted lines show it folded and solid lines show it unfolded. These boxes are arranged upon opposite sides of the car, that is to say, the ice box H is arranged upon the right hand side of the car between the door I of the car and one end wall I', and the other ice box is arranged upon the left hand side of the car between the door I and the other end wall I'' of the car. These boxes are about one half the width of the car and each comprises the combination of the outer side wall 3 having its upper end hinged to a slide 4 arranged to slide in suitable guides 5 (fixed to the roof of the car) to allow the upper end of such side

wall to slide out toward the side of the car so that the bottom of the partition can be swung upward against the ceiling transverse the car (this is detailed in Fig. 7); two swinging side walls 6, 6 each hinged at its upper end to the ceiling of the car and arranged to be folded thereagainst; the rear wall 7 hinged to the ceiling of the car at its upper end and arranged to be folded up against the folded front wall of the ice box; suitable means for securing the walls or sections against the ceiling of the car when folded, and suitable means for securing the walls or sections to each other to form the ice box when unfolded. The ice rack is hinged to one of the side walls or sections and is arranged to be folded between the side wall and the roof of the car in the same manner as those shown in Figs. 1, 2 and 4. By thus mounting one of the walls to slide from place to place in the car it becomes possible to fold all the walls against the ceiling.

Since the ice boxes H and H' are attached to the car only at the top it is necessary to secure the walls to each other in order to brace the box so that the ice will not spring the joints. The means we employ for forming a rigid connection at the corners of the box comprise a series of notched latches K fixed to the side walls of the box and projecting outward beyond the edges thereof and a series of pivoted notched latch levers K' pivoted to the end member of the box and arranged to engage the latches on the sides of the box. The levers K and K' are correspondingly notched so that each latch is seated in the notch of its corresponding lever and each lever is seated in the notch of its respective latch so that they are thereby secured together and thus prevent movement of the sides and ends with relation to each other. The boxes H and H' are each arranged with a space *h* between their rear wall and side of the car in order to allow better circulation of air.

Suitable means for elevating the side walls or partitions of the ice box may be employed in case such partitions should be deemed too heavy to be raised by hand. As shown in Figs. 1 and 5 such means may consist of the transversely arranged drum shaft L journaled in the top of the car and provided near each side of the car with a drum *l* to which is attached a chain L', the other end of which is secured to the lower transverse beam D'' of the side walls. A suitable ratchet M is provided to prevent the shaft from unwinding when the partition is elevated by winding the chain upon the drum. One end *l'* projects through the side of the car and is angular in cross-section so that a crank may be placed thereupon to rotate the shaft to wind up the chain to elevate the partition when desired. The chains are arranged at the side of the car in order to be out of the way of the load of merchandise.

It has been customary to provide vertical

cleats upon the sides of the ice boxes to keep the ice away from the sides of the box to allow the air to circulate. The cleats heretofore used for this purpose have been square or of half round shape in cross-section.

In transit the ice becomes forced against the side of the box and, as it melts it conforms to the shape of the cleated wall and where the ordinary form of cleat is employed the ice will fit so closely to the wall and cleat as to form an air tight joint around the cleat and against the wall, thus preventing ventilation. We avoid this difficulty by providing the ice box with cleats G' having flat faces *g'* presented toward the interior of the ice box and having the sides *g''* of such cleats sloping inward toward the rear face *g'''* of the cleat—that is to say, the ice box has upon the inner face of its wall a cleat tapering in cross-section toward such wall so that the cleat is of a dove-tail shape with the wide face of the dove-tail presented toward the ice and the narrow face resting against the wall of the ice box to which it is secured. This construction is illustrated in Fig. 2 where the cleats G' are shown secured to the side of the car and in detail in Fig. 9, which is a cross-section of a partition with the cleats secured thereto; a fragment of ice G'' is shown melted against the cleat. The channel melted into the ice by the broad face of the cleat is so wide as to leave spaces G''' between the sides *g''* of the cleats and the block of ice. The cleats are omitted from all the views excepting Figs. 2 and 9 for clearness of illustration.

In practice, to form the ice box shown in Figs. 1, 2, 4 and 5; the partitions are raised from the hooks *g g* and are allowed to swing toward the floor. The ice rack B'' is swung backward and downward ahead of the partition, which is then lowered until the ice rack is seated in the drip pan M', then the wall supporting beams E' are placed in position in the sockets *e'*. In the drawings only one side of the car is shown but it will be understood that both sides of the car are the same.

When the car has been loaded the ice is placed in the ice box through the hole N and the ice hole is then closed with a plug N' and cover *n*, and the car is ready for shipment.

In order to adapt the car for use as an ordinary fruit car without refrigeration we provide suitable doors in each end of the car to allow the entrance of air for the purpose of ventilation. As shown in the right ends of Figs. 1, 2, 3, and 4 one door O is arranged in the upper part of the car and another door O' is arranged in the lower part of the car. These doors are secured to crank levers P to enable them to be swung out and up, away from the openings where they are secured by means of hooks P'. It will of course be understood that the usual wire screen netting is used to prevent the entrance of cinders into the car when the doors are open but their illustration is not necessary herein. The

other end of the car is shown provided with doors Q Q' which extend across the end of the car and are arranged in corresponding sets, one upon the inside of the car and one upon the outside of the car with a dead air space between them. This construction, however, is common and we do not claim the same as our invention and therefore the outer doors are not shown.

In Figs. 1, 2, and 5, the partitions are shown suspended by means of screw eyes attached to the top of the car but in Fig. 4 they are shown suspended from a beam R which we consider the most preferable way. The beam R is clearly illustrated in Fig. 8. The supporting beams must be rigidly attached to the car.

The cars are not all exactly the same width and to enable the beams to be adjusted to fit any ordinary width of car we provide the tubular beam R which is somewhat shorter than the average interior width of the cars and each end of the beam is provided with screw threads r. Upon each end of such beam is screwed an adjusting and attaching plate R' which is screw threaded to fit upon the screw threads of the beam; these attaching plates each have an outwardly projecting annular flange r' into which the beam is screwed and the screw threads extend through such flange to the outside of each attaching plate which outer side is adapted to bear against the wall of the car. The attaching plates are screwed upon the beam until the beam will slip easily into place in the car. Then one or both of the attaching plates are unscrewed until the beam is tightly held in place by the plates thus being forced against the sides of the car; the wood bolts n' are inserted through the holes r'' in the attaching plate and screwed into the wall of the car. By this means a cheap, strong and efficient beam is provided which may be rigidly fixed in the car without the trouble and expense of fitting which would otherwise be necessary.

Now, having described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A refrigerator having an ice box formed with a partition hinged to fold against the inside of the car and an ice rack hinged to fold against said partition substantially as set forth.

2. A refrigerator car having removable partitions hinged to the car to form an ice box when unfolded and adapted and arranged to fold against the inside of the car out of the way of ordinary cargoes when not in use as an

ice box; a removable ice rack arranged to support the ice in the box and hinged to the bottom of one of the removable partitions and arranged to be folded between the partition and the side of the car when not in use as an ice rack.

3. A refrigerator car having suitable guide ways secured to the ceiling of the car and provided with an ice box comprising the front wall having its upper end attached to a slide arranged in said guideways to allow the upper end of the partition to slide so it may be folded against the ceiling of the car; two outer side walls each hinged at its top to the ceiling of the car; a rear wall hinged at its top to the ceiling of the car and arranged to fold against the front wall when such wall is folded against the ceiling of the car; a suitable ice rack; suitable means for attaching the walls to each other to form an ice box and suitable means for securing the walls against the ceiling of the car when folded.

4. A refrigerator car having its ice box formed of partitions adapted to fold against the inside of the car, and having one of such partitions arranged to slide to one side of the car to allow such partition to be folded transverse the car; suitable means for attaching the partitions together to form an ice box; suitable means for securing the partitions to the body of the car when folded, and a suitable ice rack secured to one of the partitions and adapted and arranged to fold thereupon.

5. The combination with a car of an ice box having a partition hinged at its upper end and adapted to extend to the floor of the car and the ice rack arranged to rest in use upon the car floor and jointed at one edge to the partition whereby it may fold thereagainst and against the inside of the car substantially as set forth.

6. An ice box provided with cleats each cleat having a flat face presented toward the inside of the box and having its sides beveled away toward its base.

7. An ice box having upon the inner face of its wall a cleat tapering in cross section toward such wall.

8. The combination with the car of a folding ice box arranged therein and having one of its walls hinged at its upper end and supported at such end to slide from place to place substantially as set forth.

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