

Nov. 3, 1931.

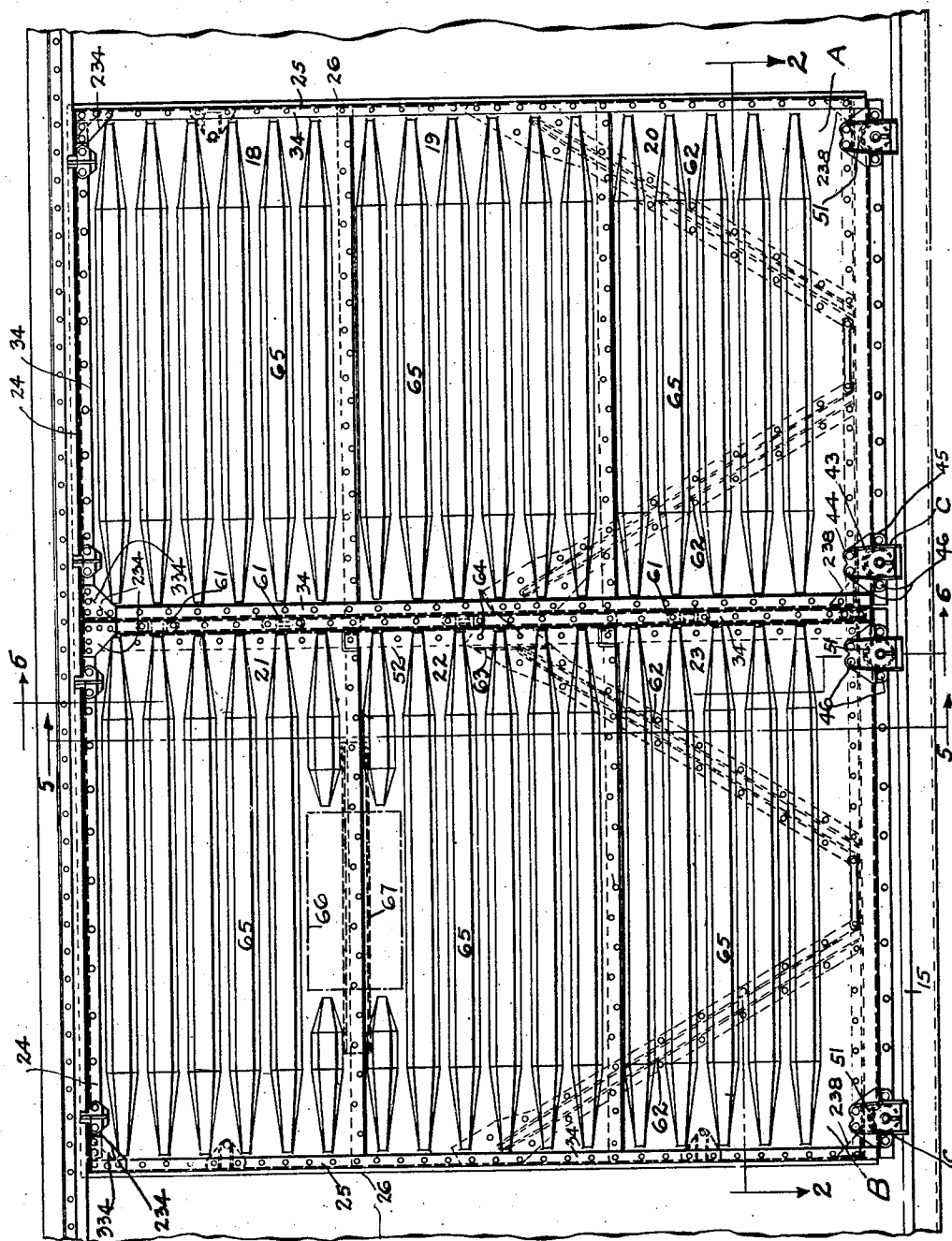
G. B. DOREY

1,830,388

CAR DOOR

Filed June 3, 1929

5 Sheets-Sheet 1



Witness
William P. Kilroy

Inventor
GEORGE B. DOREY

By George J. Haight Atty.

Nov. 3, 1931.

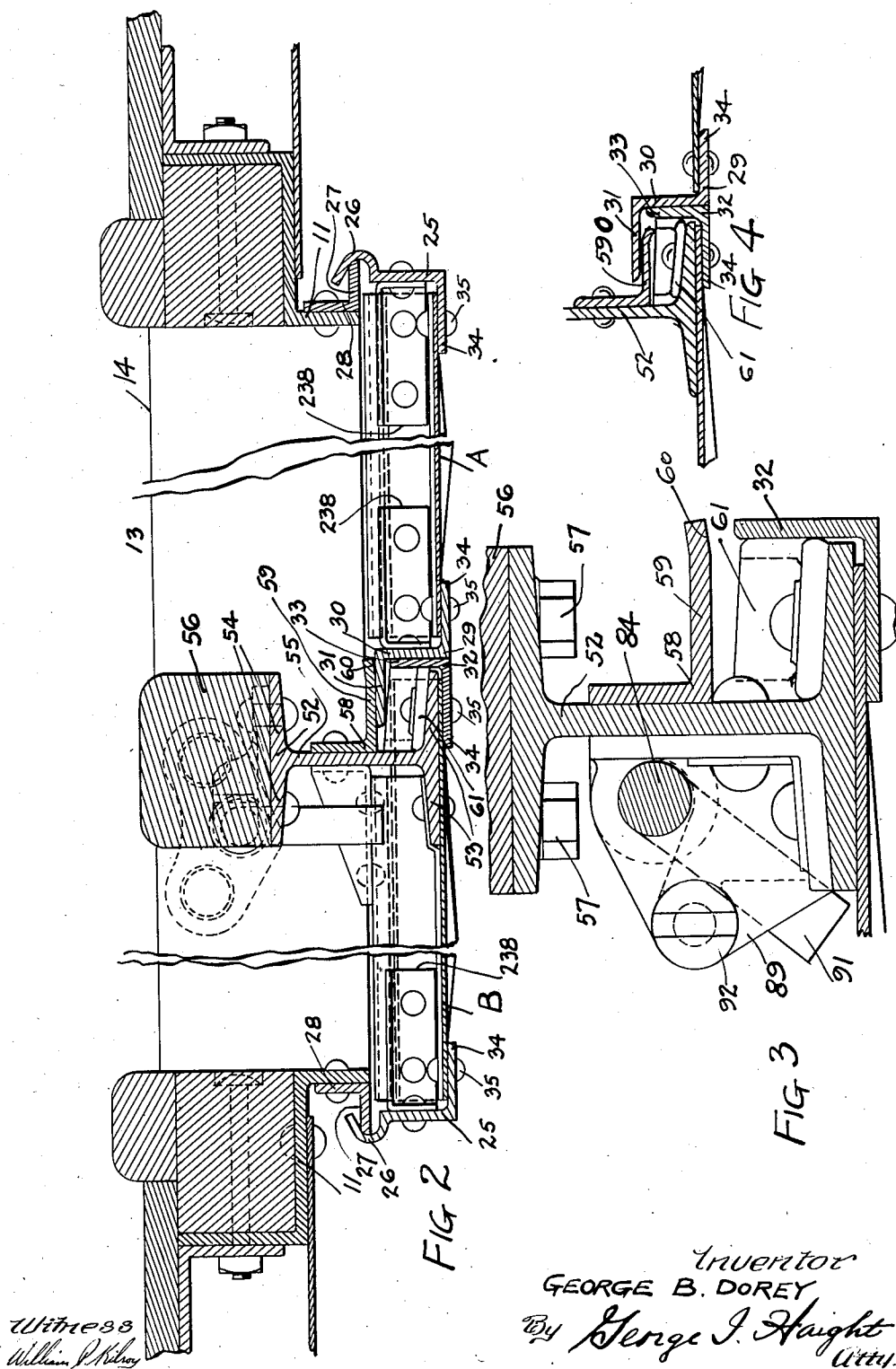
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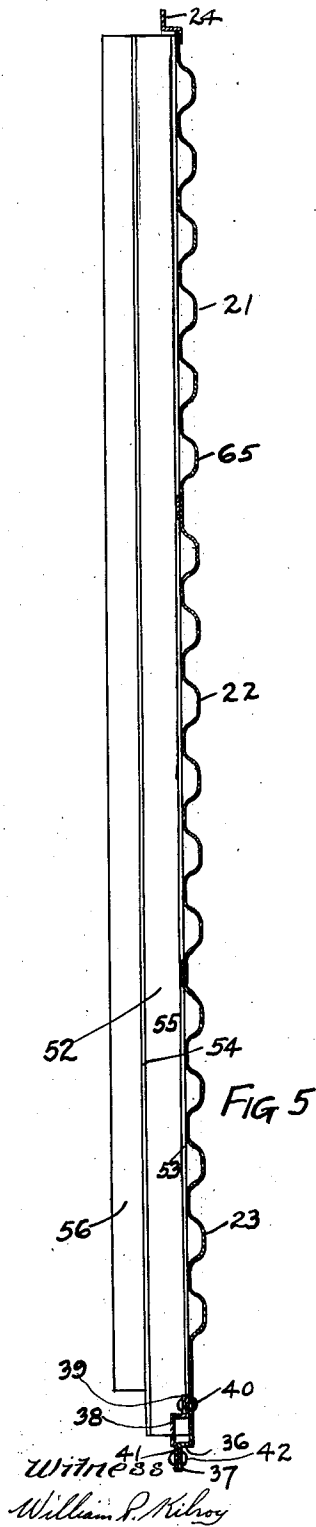
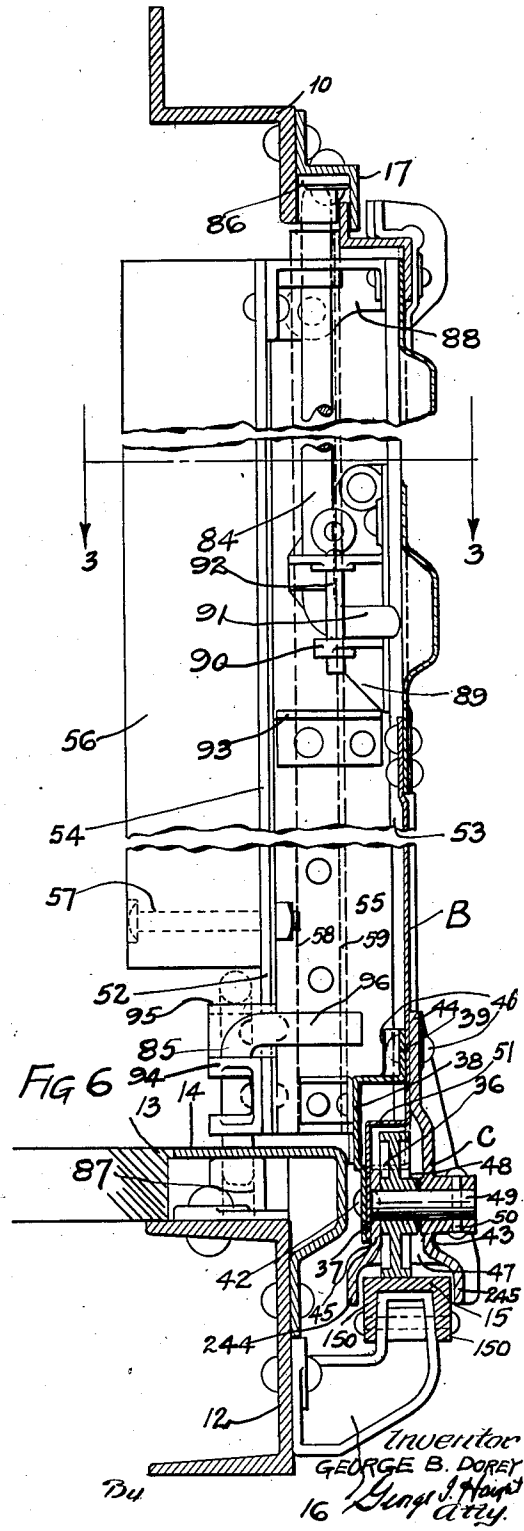
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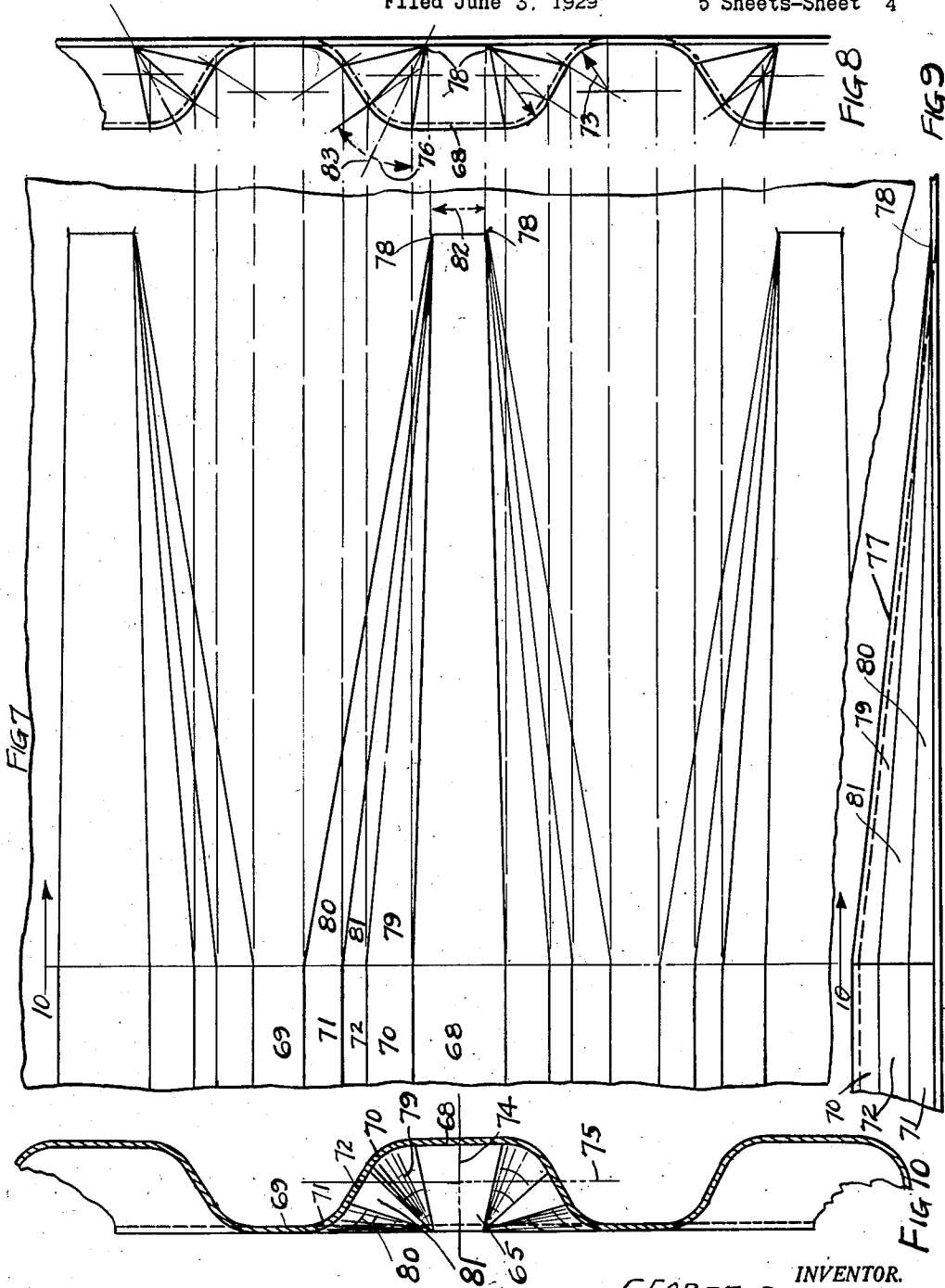
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CAR DOOR

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5 Sheets-Sheet 4



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Nov. 3, 1931.

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CAR DOOR

Filed June 3, 1929

5 Sheets-Sheet 5

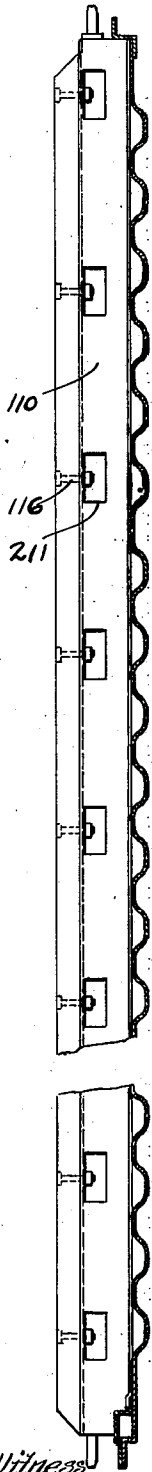


FIG 11

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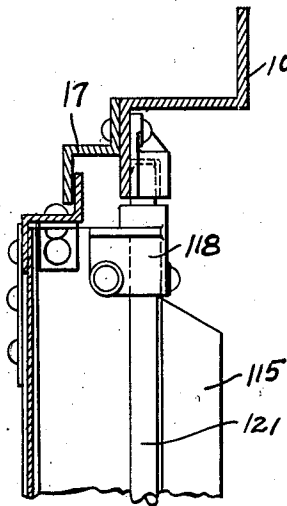
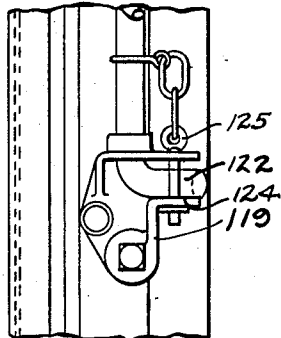
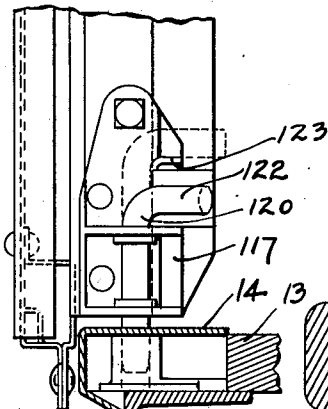


FIG 12

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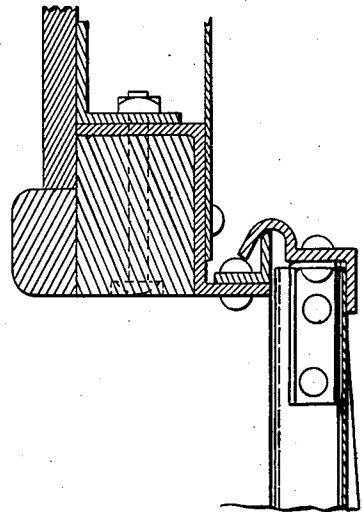
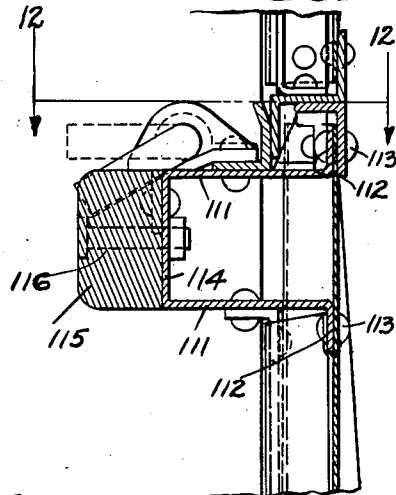
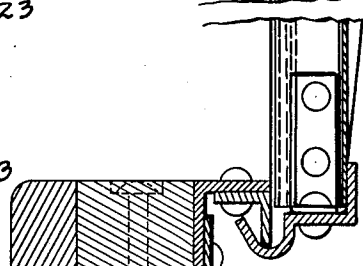


FIG 13

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UNITED STATES PATENT OFFICE

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CAR DOOR

Application filed June 3, 1929. Serial No. 367,854.

This invention relates to improvements in car doors.

An object of my invention is to provide strong and light metallic doors which will be braced by corrugations in the metallic panelling and to coordinate the strength of said corrugations with marginal members or other independent auxiliary bracing members, whereby the doors will be of ample strength to resist outward thrusts as well as buckling and racking.

Another object of my invention is to provide corrugations in the metallic panelling of a form which will present adequate strength to reinforce the plate against bending and still obviate the tendency for the plates to tear in process of manufacture.

Still another feature of my invention resides in the peculiar formation of the corrugations adjacent the ends thereof, whereby said corrugations will present crests of appreciable width at their extreme ends and cooperate with other members to reinforce the door intermediate said members.

My invention further resides in an improved door post construction for the auxiliary door of automobile cars and in the mechanism employed for locking the same relatively to the car structure.

Other objects of the invention will more clearly appear from the description and claims hereinafter following.

In the drawings forming a part of the specification, Figure 1 is a side elevational view of a portion of a car showing my improved construction incorporated therein. Figure 2 is a broken, horizontal, sectional view, on an enlarged scale, corresponding to line 2—2 of Figure 1. Figure 3 is an enlarged, detail, horizontal, sectional view of the door post construction of the auxiliary door, said view being taken on a line corresponding substantially to a line 3—3 of Figure 6. Figure 4 is a fragmentary, horizontal, sectional view, generally similar to Figure 3, and showing a different embodiment of the invention at the meeting edges of the doors. Figure 5 is an enlarged vertical, sectional view taken through the door on a line corresponding substantially to the line 5—5

of Figure 1. Figure 6 is an enlarged, broken, vertical, sectional view taken through the door structure and on a line corresponding to a line 6—6 of Figure 1. Figure 7 is an enlarged, detail view of a portion of the panelling illustrating the formation of corrugations adjacent the ends thereof. Figure 8 is an end view of the panelling shown in Figure 7, as viewed from right to left. Figure 9 is a longitudinal elevational view of the corrugations shown in Figure 7. Figure 10 is a sectional view taken through the corrugations and on a line corresponding substantially to line 10—10 of Figure 7. Figures 11 to 13, inclusive, illustrate a somewhat different embodiment of the door post construction. Figure 11 is a view somewhat similar to Figure 2, being a broken, vertical, sectional elevational view taken through the door. Figure 12 is an enlarged, broken, vertical, sectional view illustrating a different form of post construction, said view being taken on a line corresponding substantially to a line 12—12 of Figure 13, a part of the marginal reinforcement of the door being broken away adjacent the upper part thereof to better illustrate the construction. Figure 13 is an enlarged, detailed, sectional, horizontal view, somewhat similar to Figure 2, except that the different embodiment of the invention is incorporated.

Referring first to the construction illustrated in Figure 1 to 10, inclusive, the car is provided with an enlarged doorway adapted to be closed by sliding doors, as indicated at A and B, respectively. The door A is in the nature of a main door adapted to be normally used, while door B is an auxiliary door and is adapted for use only when a large door opening is desirable.

At the upper portion of the door opening, 10 indicates the usual top side plate which is preferably of Z-shape construction, 11—11 the vertical door posts of the car, 12 the lower side sill of the car, 13 the car flooring and 14 the threshold plate.

In the particular embodiment shown, the doors are of the bottom supported type and for this purpose a supporting track 15 is employed, said track preferably consisting

of a channel-shaped member with the web thereof presenting a runway on which the doors are mounted, and the flanges 150 of said channel being vertically disposed on each side of the web present guide walls adapted to cooperate with the doors in a manner to be hereinafter described. Said track 15 is preferably supported from the side sill of the car by a series of supporting brackets 16, the door being provided with supporting roller mechanisms C.

Adjacent the upper margins of the doors there is disposed the usual guiding track and weather guard 17 which in the present embodiment consists of a rolled Z bar secured to the depending flange of the member 10.

The doors A and B are composed of metal, the main body portions being of relatively light gauge, being corrugated for strengthening purposes, and preferably consisting of a plurality of panels for each door. The panelling composing the body portion of each door is preferably formed in three sections, including upper, central and lower panels, said panels comprising door A, being respectively indicated at 18, 19 and 20, and those composing door B being respectively indicated at 21, 22 and 23. The respective doors are of similar construction in so far as the upper horizontal, rear vertical and lower horizontal margins are concerned, but differ in features of construction relating to the meeting edges of the doors. Each door includes a top Z bar 24, and at the rear vertical margin a Z bar 25 having the inner flange thereof modified to present a U-shaped portion 26 adapted to engage in wedging relation with flange 27 of an angle member 28 carried by the associated door post structure 11.

The front vertical margin of door A includes a Z bar member 29 having its web 30 extending transversely of the door, and one of the flanges 31 thereof disposed in the inner plane of the door and projecting forwardly beyond the web 30 for cooperation with the auxiliary door B in a manner to be hereinafter described. The outer vertical margin of the auxiliary door B consists of an angularly shaped member 32 having one of the flanges 33 thereof extending transversely inwardly of the door. The said marginal members 24, 25, 29 and 32 each has a flange 34 overlying the body panelling and secured thereto by rivets 35, said flanges 34 defining substantially the outer plane of the framework of the door. At the upper corners of the doors suitable outer and inner gussets are employed, as indicated at 234 and 334, respectively.

The bottom of the door is formed of tubular shape for the purpose of strengthening the door, the formation being the same for both doors. The description therefore will be confined to one door. In providing the

tubular formation, the lower edge of the bottom panel is deflected inwardly to provide a horizontal web 36 and thereafter downwardly to provide a depending wall 37 spaced inwardly of the main body of the panelling. On the inner side of the door a facing plate 38 is provided which is offset inwardly and provided with a vertical flange 39 which lies against the inner side of the panelling and is secured thereto by rivets 40. The facing plate 38 adjacent the lower margin of the door is offset inwardly and extends downwardly to provide a depending flange 41, said depending flange abutting against depending flange 37 and united thereto by full headed rivets 42. Said plate 38 is further secured to the margins of the doors by brackets 238.

There are at least two roller mechanisms C per door, but since they are the same in construction, only one will be described in detail. As best shown in Figure 6, the roller construction includes a housing 43 having wall sections 44 and 45, respectively, overlying the main body section of the panelling and the inwardly offset depending wall 37, and riveted to these portions by rivets 46. The walls 44 and 45 are united by transverse integral wall sections 47, thereby forming in cooperation with said first named walls a boxlike section within which a roller 48 is disposed. Said walls 44 and 45 are extended downwardly below the transverse wall to provide walls 244 and 245 which straddle the channel members, said walls cooperating with the vertical walls 150—150 of said channel member to prevent undue outward or inward movement of the door. The roller is mounted on a pin 49 which is carried by the wall sections 44 and 45 and maintained against displacement relatively thereto by a rivet 50. The roller 48 is extended upwardly into the plane of the main body section of the door which is dished inwardly at this point, as indicated at 51, thus providing for the use of a large roller without the necessity for cutting away the plate panelling, it being understood that the overlying walls of the housing compensate in strength for the dished-in portion of the panelling.

On its inner face, the auxiliary door B is reinforced adjacent its forward margin by a vertically disposed beam member 52, said member preferably consisting of an H-beam with one set of flanges 53 lying against the inner face of the door plate and with the other set of flanges 54 spaced inwardly from the inner face of the door, the web 55 of said member extending transversely of the door. Rigidly secured to the inwardly spaced set of flanges 54 is a nailing block 56 adapted to form a nailing means to which grain doors may be secured, said member being secured to both of said flanges by a series of bolts 57, the bolts in the respective flanges being preferably arranged in staggered relation. On

the outer or forward side of the transversely extending web of the beam member, there is riveted or otherwise secured an angularly shaped member 58 having one of its flanges 59 extended in the general plane of the door and adapted to overlap the projecting flange 31 on the door A when the doors are in meeting relation, said flange 59 being flared at its outer end as indicated at 60, to assist in guiding the doors into meeting relation. With the doors in fully closed position, the marginal transverse wall 33 of door B is in abutting relation with the transverse wall 30 of door A, thereby providing substantially abutting surfaces and a weatherproof joint at the meeting edges of the doors. The forward flange of the beam member 52 is disposed in the angle presented by the door panelling, and the transversely extending flange 30 and filler castings 61 are interposed in the space intermediate the beam member and said transverse flange 30.

The doors are further braced on the inner sides thereof by diagonally extending channel shaped braces 62 which extend from the lower section of each door to the vertical marginal reinforcements, the brace leading to the H-beam member having a flanged portion offset as at 63 to overlie one of the flanges and is riveted thereto and to the door plate by rivets 64.

The strengthening indentations in the body panelling include horizontal corrugations 65 which extend clear across the door intermediate the overlying flanges 34 of the respective front and rear vertical marginal members. The horizontal reinforcements are divided at a certain point of the door B for the reception of a cardboard indicated conventionally at 66 and the door is reinforced across the plane of the said board by a channel shaped member 67 disposed on the inner side of the door. As best shown in Figures 7 to 10, inclusive, the corrugations are formed in the panelling in such a manner that the crest portions 68 extend a considerable distance outwardly beyond the outer plane or face of the door, and the valley portions 69 are disposed inwardly thereof so as to permit the same to be secured to the H beam member 52 and in certain locations to the diagonal braces 62, by riveting, as best shown in Figure 1. The crest portions 68 are each formed with a flat portion of considerably greater width than the flat valley portions 69, thus presenting increased strength at a point considerably to one side of the main plane of the door and thereby enhancing its resistance to transverse bending or buckling stresses. The offsetting in this manner of a flat portion of extended width to a considerable distance from the main plane of the plate is attended with considerable stretching of the metal and sometimes results in tearing of the metal, especially when the metal is of thin section. I

have therefore provided a novel form of connecting wall section between each flat crest and flat valley sections, whereby the major portion of the stretching will be confined to that area of metal lying between said flat crest and valley portions, and to this end the connecting portions which truss the crest and valley flat sections are composed of oppositely disposed curved arcuate sections 70 and 71, having an intermediate flat connecting wall section 72, said curves being disposed tangentially to the last named flat section and to the respective flat crest and valley sections. The oppositely disposed arcuate sections are preferably made to conform to a radius 73 of a length greater than one-half the depth of the corrugation, providing for uniform stretch of the metal throughout the length of the arcs and thus obviating a usual cause of tearing in the corners of corrugations. By thus forming the arcuate portions on a large radius adjacent to flat portions of generous width, it is possible to confine the necessary stretch of metal to the arcuate portions, inasmuch as the initiation of a bending action in the plate causes the outer fibres to stretch, and further distortion of the plate will naturally occur at the points of least resistance. With the stretching of the plate restricted to the curved sections 70 and 71, the intervening flat sections therefore retain substantially the maximum plate section, and said flat plate sections, by reason of being appreciably spaced from neutral axes 74 and 75 of the corrugations, effectively act as beams to prevent buckling or outward bending of the corrugations. The respective centers of the radii 73, defining the oppositely disposed arcuate sections 70 and 71, are spaced apart a greater distance than the combined length of said two radii, thus providing for the inclusion of the flat section 72 intermediate the curves, and confining the stretching of the material to arcs of approximately 60° as indicated at 76.

The corrugations adjacent their ends decrease in depth as indicated at 77, and said decrease in depth is accompanied by a corresponding decrease in the size of the connecting curves so that the respective curved sections 70 and 71 gradually decrease in size from a maximum at the point of maximum section of the corrugation to a common vanishing point at the extreme end of the corrugation as indicated at 78. Said oppositely disposed curved sections, due to the gradually decreasing size of the curves from a maximum to a vanishing point, assume oppositely disposed cone-like sections as indicated by 79 and 80, respectively, said sections being separated by a flat wall section 81 which also decreases and finally merges into the common vanishing point 76 which also constitutes the apex of the cone-like sections 79 and 80. The flat crest effect for the outer portion of the

corrugation is continued clear to the ends of the corrugations, said corrugations at their extreme ends being of appreciable width as indicated at 82, but of slightly reduced width as compared with the main body of the corrugation, the extent of said reduction in width being only that necessary to produce a true conical formation for the outer sections 79 and 80, and therefore the extreme outer boundary of said flat portion coincides with the vanishing point 78, the latter being determined by prolongation of the bisecting line 83 of the outer curved section 70 until the said line intersects the main plane of the plate. The corrugations having crests of appreciable width at their extreme ends, coupled with the fact that said corrugations commence immediately adjacent the overlying flanges of the vertical marginal members, assures adequate strength adjacent the auxiliary marginal members and overcomes a weakness common to all metallic doors of which I have knowledge.

It will thus be apparent that by restricting the stretching of the material to the curved sections and by gradually reducing the same as the corrugations reduce in depth, that a construction is obtained wherein the stretch of material is uniform throughout the entire length of the corrugation and bunching of metal at the ends of the corrugation prevented.

The auxiliary door is provided adjacent its meeting edge with anchoring means which preferably consists of upper and lower sliding bolts, as indicated at 84 and 85, said bolts being respectively movable into engagement with sockets 86 and 87, respectively disposed on the car structure adjacent the upper and lower portions of the door. Said bolts are preferably mounted in substantial alignment with one vertical row of rivets connecting the beam member 52 with the door plate, whereby strains against the door will be communicated squarely to the rivet heads. Said bolts are mounted in positions to be readily visible and accessible, the upper bolt 84 being slidably and rotatably mounted in spaced brackets 88 and 89. The bracket 88 is disposed at the upper portion of the door and respectively secured to the web 55 of the member 52 and flanges 53 and 54 of said member. Bracket 89 is disposed at an appreciable distance from the top of the door, respectively secured to the web 55 and adjacent flange 53 of the H member. Said member is further provided with a ledge 90 on which a laterally extending head 91, formed integrally with the upper bolt 84 is adapted to seat. Cooperable with said laterally extending head is a sliding pin 92 adapted to maintain the bolt in locked position. A bracket 93 is secured to the web of the H member for supporting said bolt when in inoperative position.

The lower bolt 85 is slidably mounted in bracket 94, said bracket being mounted on the outer face of the flange 54 of member 52 and is provided with a ledge 95 on which a laterally extending head 96, formed integrally with the said bolt, is adapted to seat to maintain the bolt in inoperative position. While I have shown the sliding bolts on the side of the post member inwardly from the edge of the door, it will be understood that the same may be applied on the opposite side of the post.

In the construction shown in Figure 3, the doors are of similar construction except that the overlying flange of the angle member 59 is disposed on the opposite side of the projecting flange 31 of the Z shaped member from that shown in Figure 2.

In the embodiment shown in Figures 11 to 13, inclusive, my improvements are shown in connection with a different embodiment of the invention wherein the post member is of box-shaped construction with the sliding bolt mechanism disposed on the forward face of the same. As shown, 110 indicates the post member having spaced transversely extending walls 111—111 and flanges 112—112 on either side thereof, overlying the inner face of the door and secured thereto by two rows of vertically extending rivets 113—113; 114 indicates the outwardly spaced wall and 115 a nailing block secured to the outwardly spaced wall by bolts 116, one of the walls 111 having perforations 211 in line with the bolts to permit access to the nuts. Secured to one of the transverse walls 111 and to the outwardly spaced wall 114 are brackets 117, 118 and 119, the bracket 117 forming a carrying member for lower sliding bolt 120 and brackets 118 and 119 forming carrying members for upper sliding bolt 121. The sliding bolts 120 and 121 are formed with laterally extending heads 122 adapted to respectively cooperate with ledges 123 and 124, respectively, formed on brackets 117 and 119 to maintain the sliding bolts in a given position. Cooperating with the head 122 of sliding bolt 121 to maintain the same in projected position is a detachable pin member 125. The respective sliding bolts 120 and 121 are disposed in substantial alignment with one of the vertically extending rows of rivets 113, and transversely in line with the reinforced marginal portion of the door, whereby the strains are transmitted directly to the strongest portion of the door. The locking bolts are shown adjacent the outer corner of the post with the laterally extending heads extending in the plane of the wooden block.

While I have herein shown and described what I now consider the preferred manner of carrying out my invention, the same is merely illustrative and I contemplate all changes and modifications that come within the scope of the claims appended hereto.

I claim:

1. A door of the character described including metallic panelling and a front marginal member having a flange overlying said panelling, and an H-beam member on the inner face of the door disposed with the web thereof extending transversely of the door, said beam being secured to the door by the flanges on opposite sides of the web, one of said flanges being secured to the overlying flange of the marginal member and the opposite flange being secured to the metallic panelling.

2. In a car door, the combination with a body portion; of a reinforced edge construction for said door including an H-beam member disposed on the inner face of the door with the web thereof extending transversely of the door, said member being disposed adjacent the free edge of the door; and an overlying angular member defining the outer edge of the door, said angular member having a flange disposed transversely of the door and having the adjacent flange overlying one of the flanges of the H-beam and secured thereto.

3. In a railway car, main and auxiliary sliding doors adapted to meet with transversely extending marginal walls in abutting relation, one of said doors having an H-beam member secured by one set of flanges on the inner side of the door adjacent the free edge thereof, and the other of said doors having its outer edge defined by a Z bar section with one flange thereof disposed rearwardly in the plane of the H-beam when said doors are in closed position, and an angle shaped member secured by one of its flanges to the web of the H-beam and having the other flange adapted to cooperate with the rearwardly disposed flange of the Z bar on the companion door to provide a tight joint.

4. A door of the character described, including metallic panelling and having front and rear vertical marginal members of appreciable depth, said front marginal member including a transversely extending wall and an angularly related flange overlying the panelling; an H-beam member on the inner face of the door disposed adjacent the front edge of the door in the angle presented by the panelling and the transverse flange, said beam being disposed with the web extending transversely of the door and having one flange secured to the overlying flange of the marginal member and having the corresponding flange on the opposite side of the web secured to the door panelling; and horizontal corrugations offset from the main body of the panelling and extending from the marginal angular member across the plane of the beam member.

5. In a sliding car door, the combination with a body section including metallic panelling, said panelling at the lower margin of the door being bent inwardly and thence downwardly to present an inwardly extend-

ing section spaced inwardly from said main portion; of a supporting roller at the lower margin of the door, said roller having a portion thereof projecting in the plane of the main body section, said body section having a portion thereof offset inwardly to accommodate the projecting portion of the roller; and a roller supporting housing having wall sections overlying the inwardly offset portion of the body section and adapted to reinforce the door across the plane of said offset portion.

6. In a sliding car door, the combination with a marginal framework of appreciable depth; of panelling disposed substantially in the outer plane of the door, a facing plate disposed substantially in the inner plane of the door, said facing plate and body panelling being deflected inwardly towards each other and formed with depending flanges adapted to be riveted together, said depending flanges and the rivet heads being disposed within the plane of the door; door carrying brackets secured to the outer face of the panelling and to the depending flange thereof; and rollers carried by said brackets, said rollers being disposed in the plane of the main body portion of the panelling, said panelling being offset inwardly to provide a dish shaped recess within which the roller is accommodated, said door brackets being provided with wall portions to reinforce the door at the inwardly offset portion.

7. In a car door having metallic plates, reinforcing corrugations in the plates formed by offsetting portions of the plates, said corrugations including flat valley portions in the original plane of the plate and flat crest portions lying outwardly of the original plane of the plate, said flat crest portions being of greater width than the valley portions, said respective flat crest portions and valley portions being united by connecting portions each consisting of oppositely disposed curves and a flat wall section between said curves, each of said curves being formed of greater radii than half the depth of the corrugation, said respective curves being tangentially disposed relatively to the last named flat portion and to the flat valley and flat crest portions.

8. In a car door having a body formed of metallic panelling, reinforcing corrugations in the panelling formed by offsetting a portion of the plates, said corrugations including flat valley portions in the original plane of the plate and flat crest portions lying outwardly of the original plane of the plate, said flat crest portions being of greater width than the valley portions, said respective flat crest portions and valley portions having oppositely disposed arcuate sections tangentially disposed relatively thereto, said arcuate portions being each formed on radii greater than one-half the depth of the corrugation, said arcuate sections associated with adjoining flat

crest and valley portions having the distance between their centers of radii spaced from each other a distance greater than the combined radii of the two curves, and a flat wall section adapted to bridge at an incline the distance between said oppositely disposed arcuate sections.

9. In a car door having metallic panelling, reinforcing corrugations in the panelling formed by offsetting portions of the panelling, said corrugations including flat valley portions in the original plane of the panelling and flat crest portions lying outwardly of the original plane of the panelling, said flat crest portions being of greater width than the flat valley portions, said respective flat crest and flat valley portions being united by connecting portions each including oppositely disposed arcuate sections and a flat wall section intermediate said arcuate sections, each of said corrugations being of uniform section for the major portion of its length and adjacent its ends decreasing in depth and vanishing in the original plane of the panelling, said flat crest portion throughout the portion of decreasing depth also decreasing in width and at its vanishing point being of slightly reduced width, said oppositely disposed arcuate sections and intermediate flat portion also decreasing correspondingly with the decrease in depth of the corrugation and vanishing at a common point on each side of the corrugation.

10. In a car door having metallic panelling, reinforcing corrugations in the panelling formed by offsetting portions of the panelling, said corrugations including flat valley portions in the original plane of the panelling and flat crest portions lying outwardly of the original plane of the panelling, said crest portions being of appreciable width throughout the entire length of the corrugation from end to end thereof, said respective flat crest portions and valley portions being united by connecting portions, each of said connecting portions consisting of oppositely disposed arcuate sections and an intermediate flat wall connecting section, each of said corrugations being of uniform section for the major portion of its length and adjacent its ends decreasing in depth and vanishing in the original plane of the panelling, said oppositely disposed arcuate sections decreasing with the depth of said corrugation whereby the arcuate sections at the portion of reduced depth are of conical shape with their apices merging with the flat crest portion at the end of the corrugation.

11. A door of the character described having a body portion of metallic panelling, flanged reinforcing members at the vertical margins of the door, said members having flanges overlying and secured to the outer edges of the panelling; a series of horizontal corrugations extending between the flanges,

said corrugations having flat valley portions disposed in the original plane of the plate and flat crest portions lying outwardly of the original plane of the plate, said flat crest portions being of greater width than the valley portions, said respective flat crest and flat valley portions being united on each side by connecting portions, said connecting portions consisting of oppositely disposed arcuate portions and a flat section between said arcuate portions, said respective arcuate portions being tangentially disposed relatively to the last named flat portion and the flat valley and flat crest portions, said corrugations adjacent their ends decreasing in depth and vanishing in the original plane of the plate immediately adjacent the overlying flanges of the vertical marginal members, the arcuate portions and intervening flat section on each side of the corrugation decreasing in proportion to the decrease in depth of the corrugation and merging in the original plane of the plate at the vanishing line of the flat crest section.

12. In a car door having metallic panelling, reinforcing corrugations in said panelling formed by offsetting a portion of the panelling, said corrugations including flat valley portions in the original plane of the panelling and flat crest portions lying outwardly of the original plane of the panelling, said respective flat crest and flat valley portions being united by connecting portions which include oppositely disposed arcuate sections and a flat wall section intermediate said arcuate section, the outer of said arcuate sections adjacent the crest portion presenting an arc defined by a radius greater than one-half the depth of the corrugation; each said corrugation being of uniform section for the major portion of its length and adjacent its ends decreasing in depth and vanishing in the original plane of the panelling; said flat crest portion at the extreme end of the corrugation being of appreciable width but of slightly reduced width as compared with the main flat crest portion, each extreme outer corner of said flat portion at its vanishing point in the original plane of the panelling coinciding substantially with a point determined by the intersection of a prolonged line bisecting the outer arcuate section and passing through the center of the radius defining the said arcuate section.

13. In a door of the character described having the main portion thereof formed of metallic panelling; marginal reinforcing members having transverse portions and vertical flanges overlying the vertical edges of the said panelling, a series of horizontal corrugations extending between the said vertical flanges, said corrugations having flat valley portions disposed in the original plane of the plate and flat crest portions lying outwardly of the original plane of the plate, said flat

crest portions being of greater width than the flat valley portions, said corrugations adjacent their outer ends decreasing in depth and vanishing into the original plane of the plate immediately adjacent the overlying flanges of the vertical marginal members, said flat crest portions of each corrugation adjacent its vanishing line being of appreciable width; and a beam member on the inner side of the door having a flat wall section overlying the vertical flange and extending into the plane of the corrugation, said member effecting continuity of reinforcement between said corrugations and vertical marginal member.

14. In a door of the character described having the main portion thereof formed of metallic panelling; flanged reinforcing members overlying the vertical edges of the said panelling; and a series of horizontal corrugations extending between the said vertical members, said corrugations having flat valley portions disposed in the original plane of the plate and flat crest portions lying outwardly of the original plane of the plate, said flat crest portions being of greater width than the flat valley portions, said corrugations adjacent their outer ends decreasing in depth and vanishing in the original plane of the plate immediately adjacent the overlying flanges of the vertical marginal members, said flat crest portion of each corrugation adjacent its vanishing line being of appreciable width.

15. In a railway car, the combination with a main door and an auxiliary door; of a reinforcement for the outer edge of the auxiliary door, said reinforcement including a member having flanges overlying the inner face of the door and wall means spaced away from the inner face of the door, said member including a transversely extending wall section connecting said flanges and wall means; bracket means overlying said transverse wall section and spaced wall means and secured to both said wall section and wall means; sliding bolt means carried by said bracket means; and socket means on the car structure cooperating with said bolt means to maintain the door in adjusted position.

16. In a structure of the character described, the combination with a main door and an auxiliary door, said auxiliary door being provided with a door post member extending rearwardly therefrom, said member including wall sections in the general plane of the door, one of said wall sections overlying the inner face of the door and the other of said wall sections being spaced inwardly away from the inner plane of the door, transversely extending wall means between said respective walls, said overlying walls presenting flanges on each side of the transversely extending wall means whereby the member is rigidly mounted on the door; a

sliding locking bolt member mounted on said member, said member being mounted in bracket means rigidly secured to the outer face of the inwardly spaced wall; and bolt receiving means on the car structure adapted to cooperate with the locking bolt to maintain the door in closed position.

17. In a structure of the character described, the combination with a main door and an auxiliary door, said auxiliary door being provided with a door post member extending rearwardly therefrom, said member including wall sections extending in the general plane of the door, one of said wall sections overlying the inner face of the door and the other of said wall sections being spaced away from the inner plane of the door, transversely extending wall means between said respective walls, said overlying walls presenting flanges on each side of the transversely extending wall means, whereby said member is rigidly secured to the door on each side of the transversely extending wall means by a line of vertical rivets; and sliding bolt means mounted on said post member for reciprocatory movement, said bolt means being mounted substantially in alignment with the line of rivets securing the flange to the door; and pocket means on the car structure adapted to receive the bolt means to maintain the door in adjusted position.

18. In a railway car, the combination with a main door and an auxiliary door; of a reinforcement for the outer edge of the auxiliary door, said reinforcement including an H-beam member, said reinforcement being disposed adjacent the front edge of the auxiliary door on the inner side thereof, with the web thereof extending transversely of the door, said beam member being secured to the door on each side of the web by a set of flanges, thereby spacing the other set of flanges at an appreciable distance from the inner face of the door, a wooden nailing block secured to the last named set of flanges; sliding locking bolts carried by the said beam member; and pocket means on the car structure adapted to receive the sliding bolts to maintain the door in adjusted position, said sliding bolts and wooden nailing block being contained substantially in the plane of the attaching flanges.

19. In a door structure of the character described, the combination with main and auxiliary sliding doors, said auxiliary door having a nailing block disposed substantially flush with the forward edge of said door and offset inwardly thereof, and a post for said auxiliary door including a flat plate section extending rearwardly from the forward edge of the door an appreciable distance, and secured flat-wise against the inner surface of the body portion of said door, and also having a spaced plate section sup-

porting said nailing block, and a web connecting said spaced plate section and offset rearwardly from the forward edge of said door; and a reinforcing element on said main door and having a projecting flange
5 portion extending between said plate sections and inwardly of the plane defined by the forward edge of said door and the forward portion of said nailing block.

10 20. In a door structure of the character described, the combination with main and auxiliary sliding doors, said auxiliary door having a nailing block disposed substantially flush with the forward edge of said door
15 and offset inwardly thereof, and a post for said auxiliary door including a flat plate section extending rearwardly from the forward edge of the door an appreciable distance, and secured flat-wise against the inner
20 surface of the body portion of said door, and also having a spaced plate section supporting said nailing block, and a web connecting said spaced plate section and offset rearwardly from the forward edge of said
25 door; and a reinforcing element on said main door and having a projecting flange portion extending between said plate sections and inwardly of the plane defined by the forward edge of said door and the forward portion of
30 said nailing block, said reinforcing element being in the form of a Z-bar having its transverse web providing an abutting surface; and a reinforcing element secured to said auxiliary door and said post at its forward edge
35 and including a transversely extending flange forming an abutting surface cooperable with the web of said Z-bar.

In witness that I claim the foregoing I have hereunto subscribed my name this 31st
40 day of May, 1929.

GEORGE B. DOREY.

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