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Adler et al.

[11] **3,718,100**

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[54] **RAILROAD BOX CAR AND DOOR POSITIONING AND STOP MEANS THEREFOR**

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[21] Appl. No.: **104,700**

[52] **U.S. Cl.** **105/378**

[51] **Int. Cl.** **B61d 19/00**

[58] **Field of Search** 105/378, 280; 49/209, 210; 292/256

[56] **References Cited**

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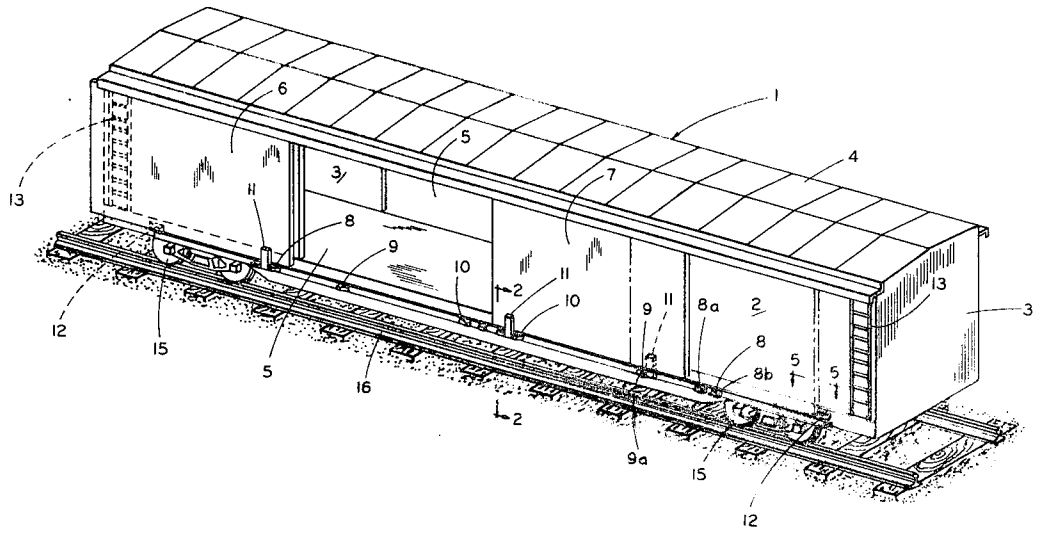
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[57] **ABSTRACT**

In a railroad box car having on each side a pair of outwardly and inwardly moving doors to open and close a central door opening, longitudinally spaced door positioning and door stop means in the form of bottom-of-door catch assemblies including a pair of longitudinally spaced catch units for holding the door in a closed position and a half-opened position and a fully opened position respectively and further stop means at each end of each side of the car inwardly of an end ladder to prevent movement of a respective door outwardly beyond the ladder to the fully opened position, each catch unit including a pivotally mounted vertical catch arm mounted on the door and engageable with stop blocks on the car side sill and the stop means including a horizontally extending stop arm normally urged outwardly in the path of the outwardly moving door by rotation of the stop arm down an inclined guide urging the stop arm in an outwardly extending position in the path of the door.

13 Claims, 6 Drawing Figures



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SHEET 1 OF 2

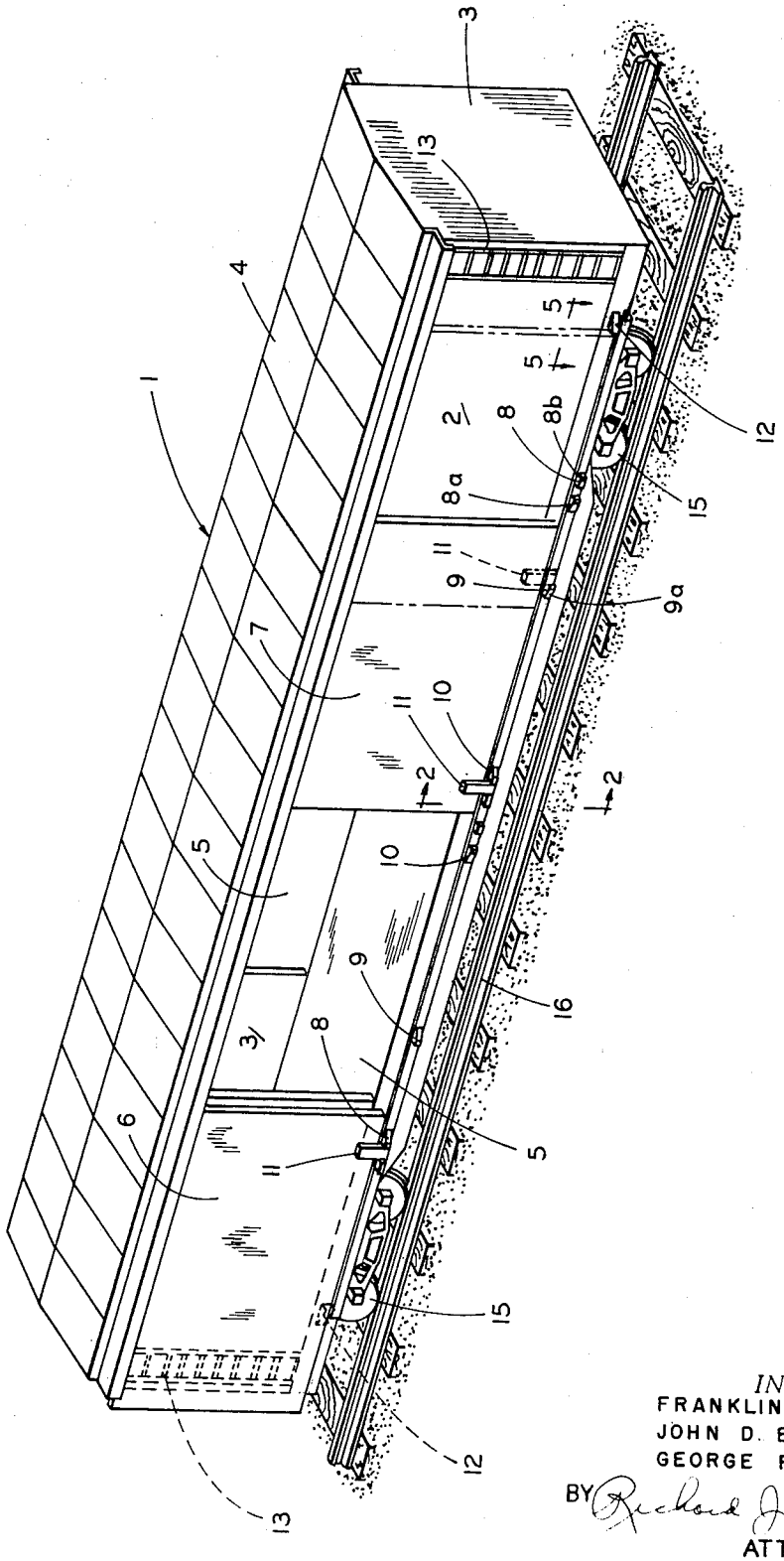


FIG. 1

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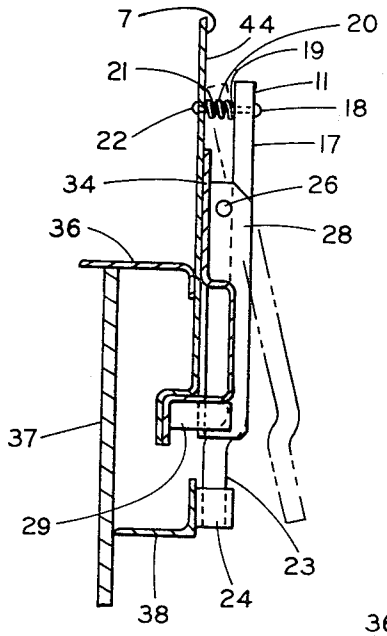


FIG.2

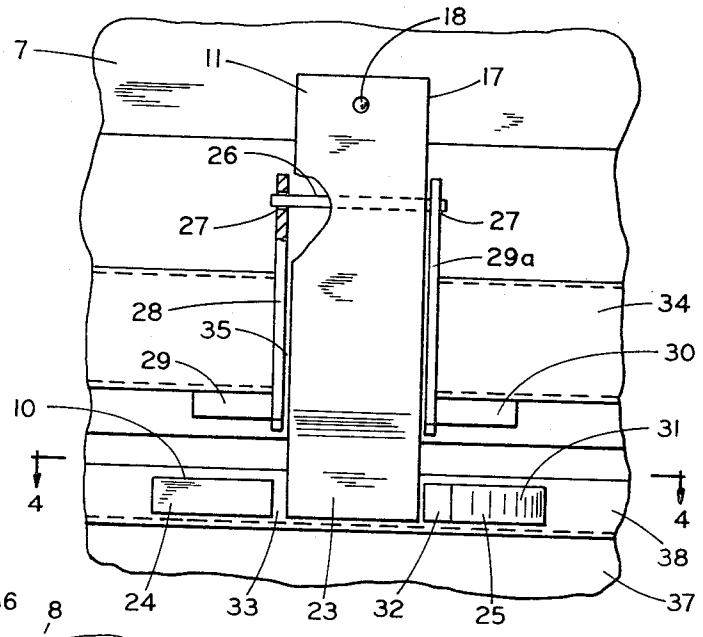


FIG.3

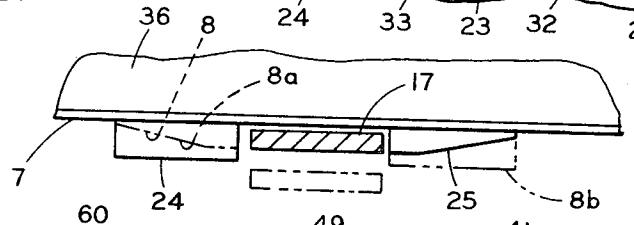


FIG.4

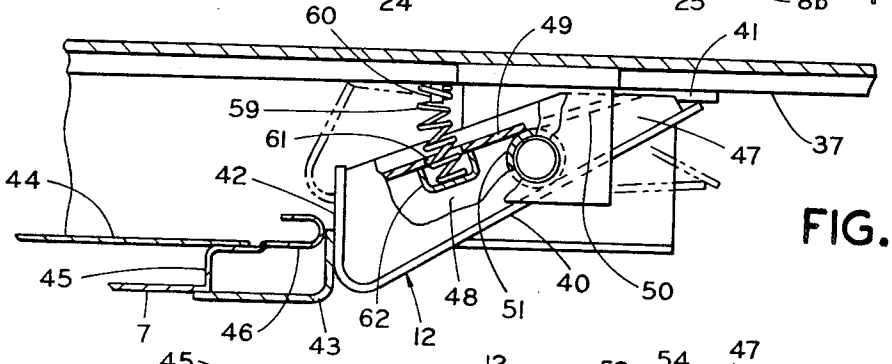


FIG.5

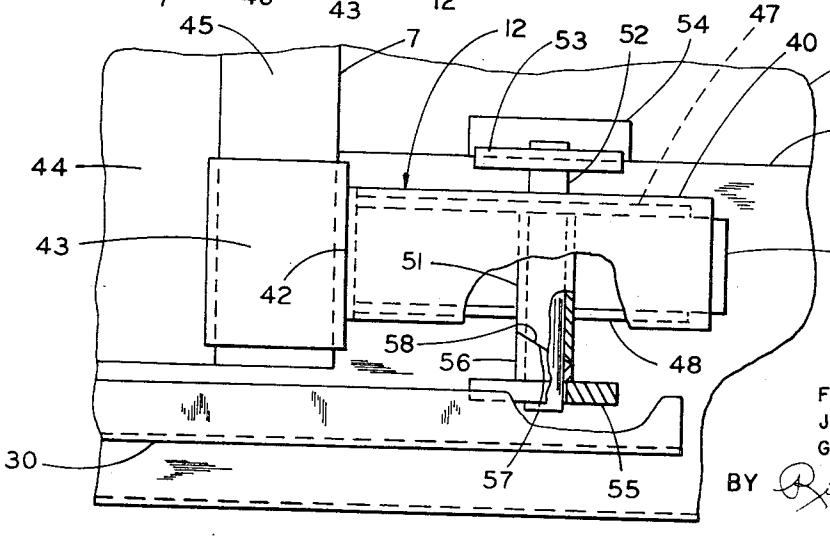


FIG.6

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RAILROAD BOX CAR AND DOOR POSITIONING AND STOP MEANS THEREFOR

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to railroad box cars and in particular to the sliding side doors of the box car and stop means for use by such doors.

2. Description of the Prior Art

It is heretofore known to provide for means to prevent movement of the sliding doors of the box car but as a safety feature it is desirable to provide for limiting movement of the sliding doors beyond the ends of the car, particularly where the door passes by a side-mounted end ladder and could get in the way of an operator or person on the ladder. Further, it is desirable to have an arrangement whereby the door may be simply locked or held in several longitudinally spaced positions at the bottom of the car. The invention disclosed herein solves such problems.

SUMMARY OF THE INVENTION

This invention relates to box cars and in particular to means for positioning and locking the side doors of the box car.

Therefore, a general object of this invention is to provide for bottom-of-door catch assemblies which position the door between partially open and closed positions and where there is further provided a positive stop located at each end side of the car to prevent movement of the car door outwardly of the end portion of the car and in particular to prevent movement of the door past a ladder mounted at each end of a side of the car. The bottom door catch assemblies include blocks mounted below the door opening on the car and are adapted to entrap pivotal vertically extending catch arms mounted on the door of the car wherein the blocks may be located in several places longitudinally spaced of one another to permit the door to be either closed or partially opened.

Still another object of this invention is to provide for an end-of-car stop mounted at each end of the side of the railroad car just inwardly of the car ladder to prevent movement of the car door over the ladder. In particular, the safety stop includes a stop element pivotally mounted on a vertical axis and slidable on a downwardly inclined plane attendant to directing the stop element outwardly in the path of a moving car door.

Further, it is an object of this invention to provide biasing means urging said end door stop outwardly into the path of movement of the car door.

These and other objects will become apparent by reference to the following description, attached drawings, and appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a railroad box car employing novel door positioning and door stop means;

FIG. 2 is a partial sectional view taken generally along line 2—2 of FIG. 1;

FIG. 3 is an enlarged partial side elevational view of the door positioning catch assembly;

FIG. 4 is a partial sectional view taken substantially along line 4—4 of FIG. 3;

FIG. 5 is a partial sectional view taken substantially along line 5—5 of FIG. 1; and

FIG. 6 is a partial enlarged view of the positive stop or safety lock protecting a man on a side ladder of the car.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference now to the drawings, there is shown a railroad box car 1 which is provided with sides 2, ends 3 and a roof 4. Each side is provided with an opening 5 which may be covered by movable doors 6 and 7 carried on rollers (not shown) whereby door 6 may be moved to the open position and door 7 may be moved to the closed position. Each door may be held in the fully opened position, the partially opened position, or the fully closed position by door positioning structures 8, 9 and 10, respectively. The partially or half-opened position of door 7 is shown in dotted line. Positioning stop structure 11 is shown on each door 6 or 7 for cooperating with one of the positioning structures 8, 9 or 10 and end-of-car door stop structure 12 is provided at each end of the car just inwardly of the railroad car ladder 13 to prevent the door from moving to the fully opened position where the door passes over and past the ladder 13. This stop arrangement 12 insures that the door will not hit someone who may be on a ladder 13. The only way the door can go then to the open position is to operate the door stop to move it out of the path of the door whereby the door stop 11 may move into the stop arrangement 8. The railroad car sits on trucks 15 on tracks 16.

The various positioning and stop arrangements are more clearly shown in FIGS. 2–6. The door stop arrangement for maintaining the door at the closed or center position of the car includes the door-mounted pivotal stop structure 11 which has a vertically extending depending stop arm or plate 17 which at its upper end has a pin or spring retainer element 18 extending through the door and having an inner extension 19 about which extends a spring 20 which extends about spring retainer extension 21 of the retainer 22 mounted in the door 7, the extension 21 being spaced sufficiently away from the extension 19 to allow for compression of the spring 20 with consequent outward pivoting of the stop arm outwardly of the door as shown in the dotted line position in FIG. 2. The lower end part 23 of the depending arm 17 is set inwardly of the upper portion of said arm 17 and between the stop blocks 24 and 25 of the stop or positioning arrangement 10. The door arm pivots about the pivot pin 26 carried in journals 27 in upright plates or housing members 28 and 29*a* on either side of the arm 17. The lower ends of the plates 28 and 29*a* are adjacent the plate reinforcement structures 29 and 30 respectively, the purpose of which is to take up longitudinal door thrusts. The stop block 25 is provided with a chamfered edge or surface 31 which permits the pivotal stop structure 11 to ride up over the chamfered surface 31 onto the flat surface 32 of the block 25 and into the recess 33 provided between the stop blocks 24 and 25 and to be retained therein as seen in FIG. 3. The door 7 is provided with a lower outer bottom edge plate against which are located, in a cut-out portion 35 thereof, plates 28 and 29*a*, the plate reinforcement structures 29 and 30 being attached to

the underside of the door edge 34. The floor 36 is adjacent the door 7 on top of the side sill 37 which supports below the floor the door guide track 38 for the door rollers (not shown). The lower end 23 of the pivotal door plate or stop 17 is recessed with respect to its upper portion to provide for railroad clearance requirements and to reduce the bending lever on the stop blocks 24 and 25. In FIG. 4 the stop arm 17 is shown in plan sectional view between the stop blocks 24 and 25 and the stop plate 17 is also shown outwardly in the disengaged or unlocked position. FIG. 4 also depicts in dotted line the half-way open position of the stop arrangement 9 which uses a single tapered stop block 9*a* (see FIG. 1) or the fully open position of the stop block arrangement 8 which utilizes the tapered face block 8a and the square block 8b as shown in dotted line in FIG. 4. The stop block structures 8, 9 and 10 for the door 6 are the same as for door 7 except that their respective stop blocks are reversed. Consequently, when either door moves from the closed position to the open position, the lever 11 is depressed at the top to allow it to swing outwardly when leaving the stop arrangement 10 and it slides over the chamfered surface of the stop block 9a and also the chamfered surface of the stop block 8a whereas when the door goes to the fully closed position the lever must be extended outwardly to pass over stop elements 8*a* and 9*a* but it rides over the chamfered surface of the block 25 of the stop arrangement 10.

As seen in FIGS. 5 and 6, the details of the end-of-car stop 12 is shown and it comprises a longitudinally extending stop arm 40 which is mounted for pivotal movement about a vertical axis. The arm structure extends in the normal or stop position with its outer end portion or plate 41 against the side sill 37 at the outer end of the car adjacent the ladder 13 and the inner end or plate portion 42 is in abutting relation with the bumper stop plate 43 of one of the doors 6 or 7. As seen in FIG. 5, the door 7 is provided with a sheet 44 connecting with the rear edge part 45 of the door which has a curved portion 46 joining with the right-angled bumper plate 43. The stop arm 40 further includes a top plate 47, a bottom plate 48, an inner or back plate portion 49 and an outer plate portion 50 joining with the plate portion 42. A tube or journal 51 is fixedly attached to the plate portions 47, 48, 49 and 50 and is generally centrally located within the stop arm 40 and receives therethrough a vertically extending pivot shaft 52 which is fixedly held in an upper bar or pivot mount structure 53 fixedly attached to filler block 54 attached to the side sill 37. The shaft 52 is fixedly attached to a lower journal or pivot mount 55 fixedly attached to the side sill 37 and the pivot mount 55 fixedly supports thereon a sleeve 56 which is provided with a top or upper sloped arcuate or helical surface 57 that tapers and curves in a circular path from the upper left down to the lower right, as viewed in FIG. 6, and cooperates with a curved or arcuate surface or edge 58 on the underside of the tube 51, the helical under surface or edge 58 being complementally tapered or sloped downwardly from the left to the right as viewed in FIG. 6. Consequently, the weight of the stop arm structure 40 causes the arm structure 40 to ride down and outwardly along the inclined surface 58 to normally and naturally maintain the stop structure 40 in the solid line position shown in FIG. 5 to engage the door 7 and prevent any further outward movement of the door. A spring 59 is mounted about a pin 60 mounted on the sill 37 and engaging with arm 40 by way of an opening 61 in the plate 49 and into a recessed pocket defined by U-shaped plate 62 whereby the spring biases the stop arm outwardly as shown in FIG. 5 to complement the efforts of the curving sloped surfaces 57 and 58, although the use of the spring is not necessary to maintain the door stop element 40 in an outward door stopping position as distinguished from a manually moved inner position as shown in dotted line in FIG. 5 whereby the door will pass by stop structure 12.

It is thus seen that the stop structures 8, 9 and 10 cooperate with the stop arm 11 to position the car doors longitudinally of the car in one of three positions and the stop structure 12 at each end of the car prevents movement of the respective door to the fully open position so as not to pass over the ladder unless the last mentioned end stop structure is depressed inwardly to permit the door to move to its most outer position.

The foregoing description and drawings merely explain and illustrate the invention and the invention is not limited thereto, except insofar as the appended claims are so limited, as those skilled in the art who have the disclosure before them will be able to make modifications and variations therein without departing from the scope of the invention.

What is claimed is:

1. In a railroad car having sliding side door means movable between an intermediate car portion and the end portion of the car, car door positioning means comprising:

a downward depending latch arm being pivotal about a generally horizontal axis on the door means and movable from an open to catch position,

positioning catch means being mounted on the lower part of the side of the car below the door means between the intermediate portion and the end portion of the car and in the path of the latch arm for engagement therewith,

biasing means urging said latch arm into engagement with the catch means,

said biasing means being between the door means and the upper part of the latch arm and pivot means connecting the door means with the latch arm being between the place of engagement of biasing means with the door means and the lower part of the latch arm, and

said catch means comprising a stop block having latch engaging surface limiting movement of the latch arm in one direction, said latch arm having its lower end part being engageable with said surface for holding the door in a certain position.

2. The invention according to claim 1, and

said stop block having a chamfered surface aiding movement of the latch arm over and past the stop block attendant to permitting movement of the latch arm in the opposite direction.

3. The invention according to claim 1, and

said catch means comprising a pair of longitudinally spaced stop blocks with a latch arm receiving recess between them, said latch arm having its lower end part being engageable with said recess for holding the door in a certain position.

4. The invention according to claim 1, and
said door means having longitudinally spaced vertically extending reinforcement members, one on each side of the latch arm for reinforcing the arm against longitudinal horizontal loads.

5. In a railroad car having sliding side door means movable between an intermediate car portion and the end portion of the car, car door stop structure comprising:
a door stop means being pivotally mounted on the lower part of the car side at the end of the car and having an arm portion swingable into the path of movement of the door means,
said door stop structure including a journal means having an upwardly facing surface means supporting said stop means, said surface means presenting an upwardly sloped arcuate helical path,
said stop means having downwardly facing edge portion, the edge portion defining a downwardly sloping arcuate path complementally engaging with the path of the surface means in biasingly moving the arm portion downwardly and outwardly into the path of door movement.

6. The invention according to claim 1, and
said surface means and journal means being out of register with one another in the door unobstructing position of the door means where arm portion must be held at the upper portion of the surface means of the journal means.

7. The invention according to claim 6, and
ladder means at the end of the car, said stop means being adjacent the ladder means between the ladder means and the intermediate portion of the car, said stop means preventing movement of the door means past the ladder means.

8. In a railroad car having sliding side door means movable between an intermediate car portion and the end portion of the car, car door stop structure comprising:
a door stop means being pivotally mounted on the lower part of the car side at the end of the car and having an arm portion swingable into the path of movement of the door means, and
biasing means disposed between the door means and one end of the arm portion urging the other end of the arm portion into the path of door movement.

9. The invention according to claim 8, and
said biasing means comprising spring means.

10. In a railroad car having sliding side door means movable between an intermediate car portion and the end portion of the car, stop structure comprising:
a vertical pivot member,
upper and lower journals supporting the pivot member,
a stop arm member having a tubular part rotatable on said pivot member in a generally horizontal position between inward unobstructing door position and an outward door obstructing position in the path of movement of the door means, the stop arm member having a horizontal arm part projecting out from the tubular part, the lower journal having an arcuate upwardly sloped bearing for said tubular part and said tubular part having a lower arcuate surface engaging with said sloped bearing whereby said arm part is rotated outwardly and downwardly by gravity attendant to obstructing movement of the door.

11. In a railroad car having sliding side door means movable between an intermediate car portion and the end portion of the car, car door positioning means comprising:
a downward depending latch arm being pivotal about a generally horizontal axis on the door means and movable from an open to catch position,
positioning catch means being mounted on the lower part of the side of the car below the door means between the intermediate portion and the end of the car and in the path of the latch arm for engagement therewith, and
car door stop structure comprising a door stop means being pivotally mounted on the lower part of the car side at the end of the car and having an arm portion swingable into the path of movement of the door means.

12. In a railroad box car,
a pair of door means and car side means on each side of the car,
the door means of each pair of door means being movable toward and away from one another attendant to closing and opening the doorway of its respective side of the car,
door position latch arm means being pivotally mounted on each door means,
position catch means for each door means being mounted on the car side means at various positions along each half length of the car for engaging the door position latch arm means in one of a plurality of closed to open positions, and
end stop structure at each end of each side of the car for limiting movement of the respective door means beyond its respective end of the car and including stop means pivotally biased on the car side means to a door engaging position for engagement with a respective door means and further including journal means being fixedly mounted on the car side means for supporting said stop means.

13. The invention according to claim 12, and
said journal means having an upwardly sloped curving upwardly facing supporting surface and said stop means having a stop arm pivoted about a vertical surface of the stop structure and having a downwardly facing downwardly sloping curving edge surface complementally registerable with the supporting surface of the journal means whereby the stop arm is disposed to ride down the journal surface and swing outwardly to engage the respective door means.

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