March 7, 1933. K. F. NYSTROM 1,900,254

LATCH MECHANISM

Filed June 14, 1930 2 Sheets-Sheet 1

Fig. 1

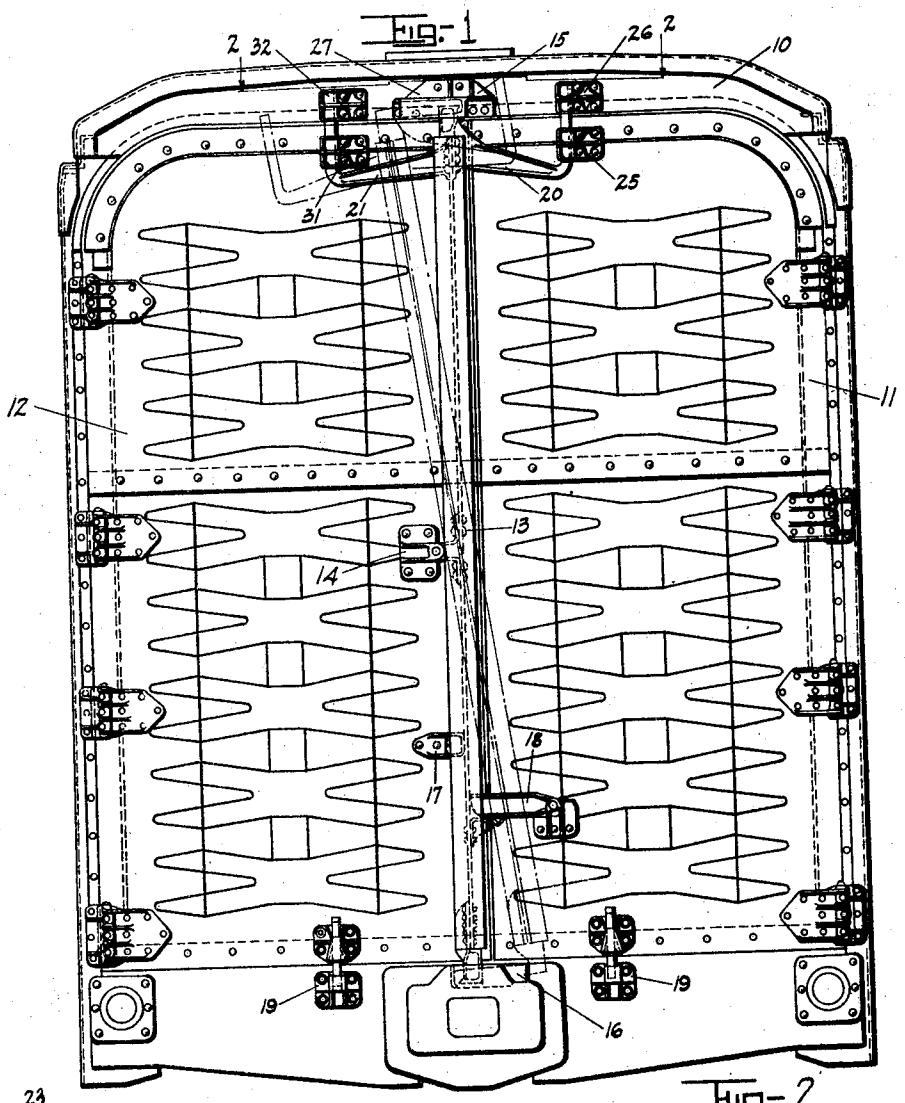

Fig. 2

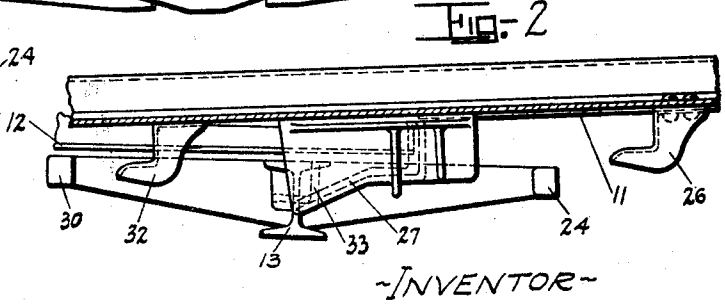

Fig. 3

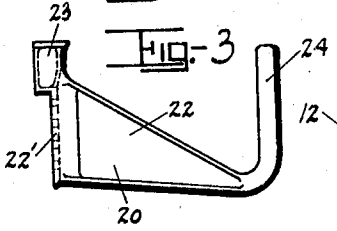

Fig. 4

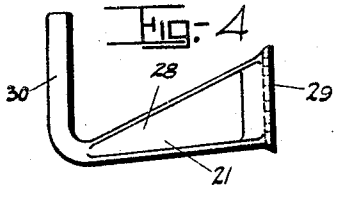

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FIG. 5

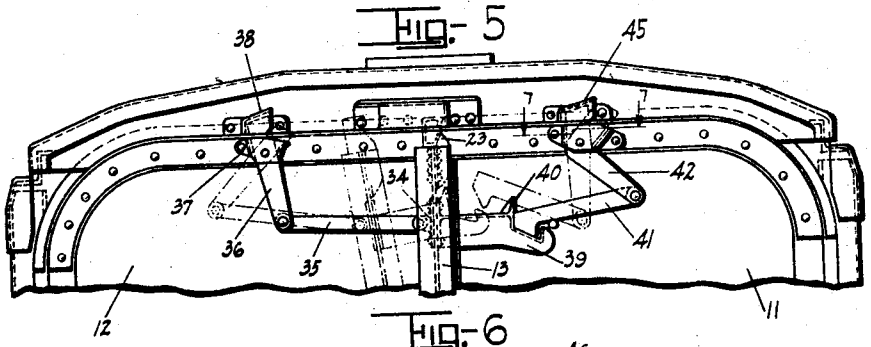


FIG. 6

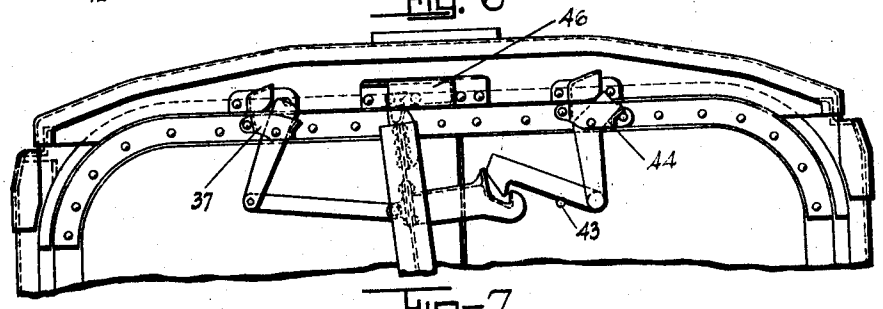


FIG. 7

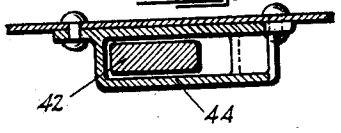


FIG. 8

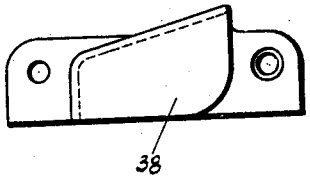
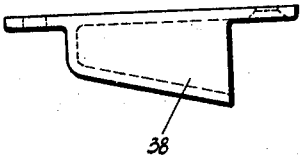


FIG. 9



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Patented Mar. 7, 1933 1,900,254

UNITED STATES PATENT OFFICE

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LATCH MECHANISM

Application filed June 14, 1930. Serial No. 461,068.

This invention relates to latch mechanism intended primarily, though not so restricted, for application with swinging doors which may be employed on the ends of railway house cars.

In latch devices employed in connection with end doors for house cars it has been the practice to utilize a main latch for securing the end doors at their meeting edges and to employ separate auxiliary latches spaced from the main latch for the lower edges of said doors. While this arrangement presented a strong construction at the lower margin of the doors, it was found in instances of shifting lading, for example, within the car, that the main latch alone was insufficient to provide requisite fastening means for the upper margin of the doors. Moreover, the problem of supplying additional and satisfactory securing means for the upper part of the doors was further complicated by the position of such means at a height which prevented ready access and easy operation thereof.

This invention, therefore, has for an object the provision of ordinarily inaccessible latch means for the upper margin of swinging doors which may be employed in house cars, the said means being adapted for control without the necessity of climbing up on the car.

A further object is the provision of auxiliary latch means for end doors operable in response to the movements of main latch means.

It is also an object to provide auxiliary latch means for the upper margin of a swinging door related to main latch means for the door so as to insure latching of the upper part of the door under conditions where such part may be bowed outwardly.

Other objects of the invention will appear as the description proceeds, taken in connection with the drawings forming a part thereof, in which

Figure 1 is an elevation of a car end construction disclosing latch mechanism embodying the invention.

Figure 2 is a section taken on line 2—2 of Figure 1, illustrating the condition relative to the left hand door which may occur when said door is bowed outwardly at the upper part thereof.

Figures 3 and 4 are detail elevations of the auxiliary latch means employed for the upper margin of the doors.

Figure 5 is a fragmentary elevation of a modified construction.

Figure 6 is a view similar to Figure 5, illustrating the position of the parts of the latch mechanism when the main latch has just engaged with its keeper.

Figure 7 is a sectional view taken on line 7—7 of Figure 5.

Figures 8 and 9 are detailed elevation and plan views, respectively, of auxiliary keepers.

Referring to the drawings, the numeral 10 designates in its entirety the end construction of a railway house car, including a pair of swinging doors 11 and 12 which, as is customary in such construction, are adapted to overlap at their inner edges. A main latch bar 13 is pivoted for swinging movement on a casting 14 shown disposed on the door 12. The latch bar is adapted to bring about engagement between latch means carried thereby and keepers 15 and 16 mounted on the car above and below the doors, respectively, in order to latch the doors in closed position. A limiting stop 17 is carried by the door 12 and is adapted for engagement with the latch bar. A pivoted abutment latch 18, carried by the door 11, is utilized to maintain the main latch in its latching position. Auxiliary latch means 19—19 are customarily employed for the lower margins of the doors.

From the above arrangement of main and auxiliary latches, it is evident that the lower margin of the doors are substantially secured and that resistance against distortion,

which may be caused by shifting lading, is greatly increased. It has been found, however, that the main latch alone, employed at the upper margin of the doors, is not infrequently ineffective to resist thrust and the condition has been encountered whereby both the main latch and the keeper have been sheared off. For the highest efficiency in the operation of the doors for the ends of house cars it is deemed necessary to utilize a construction at the top of the doors which will effectively obviate the conditions set out above. This construction preferably takes the form of additional latch means, such latch means being relatively inaccessible. Constructions have been devised whereby they may be operated by the main latch from the normal position of the trainman.

In the embodiment of this invention illustrated in Figures 1 to 4, inclusive, there is disclosed a pair of auxiliary latches 20, 21 for the upper margin of the doors. The auxiliary latch 20, in its preferred form, presents in an integral structure a body portion 22, provided at one end with an attaching portion 22′ and a main latch casting 23 and at the other end with a substantially vertical latch arm 24, which is adapted for engagement with keepers 25 and 26 mounted on the door and on the car, respectively. The main latch casting 23 is capable of latching engagement with a main keeper 27 secured to the car. The auxiliary latch 22 comprises a body portion 28 and is formed at its opposite extremities with an attaching portion 29 and a latch arm 30. The latch arm is adapted for engagement with corresponding keepers 31 and 32. In the preferred form noted above one of the auxiliary latches is shown formed integral with the main latch casting, but it is apparent that a single formed member may embody both the auxiliary latches and the main latches or three separate members may be used if desired. In any event only a single set of rivets is required for fastening the latch members to the latch bar 13.

The main keeper 27 is provided with an outwardly tapered portion 33 which coacts with the main latch casting 23 to insure drawing of the doors inwardly into proper position in the door opening. It is apparent from Figure 1 of the drawings that engagement between the main latch and its keeper occurs prior to the engagement between the auxiliary latches and their corresponding keepers. Such an arrangement is deemed high desirable as will appear from a consideration of Figure 2. In this figure the door 12 is represented as being in a position it would assume were it bowed outwardly at the top so as to prevent proper seating in the door opening. The position taken by the auxiliary latches is then as illustrated and it is clear that engagement between the auxiliary latches 24 and 30 and their corresponding keepers by a swinging movement only of the main latch bar is impossible. However, by the utilization of the outwardly flared portion on the main keeper as well as by the provision for engagement between the main latch casting and its keeper prior to engagement between the auxiliary latches and their keepers the bowed portion of the door will be forced inwardly into the door opening during swinging movement of the main latch and the auxiliary latches will also be given a transverse movement whereby they will be brought into proper alignment with their keepers so as to insure the desired latching. The condition treated above in respect to door 12 applies as well to door 11 or to a condition in which both doors are bowed outwardly.

The principle of the invention is also embodied in the construction shown in Figures 5 to 9, inclusive. In this embodiment the latch bar 13 is provided adjacent the latch casting 23′ with a bracket 34 to which one end of the arm 35 is pivoted. The other end of the arm 35 is pivotally connected to an auxiliary latch 36, which is swingably mounted intermediate its ends in a bracket 37 carried by the door. The auxiliary latch is adapted for engagement with a keeper 38 secured to the car above the door. Extending from the opposite side of the bar 13 is a catch member 39 rigidly carried by said bar. The catch member is provided with an abutment portion 40 adapted for engagement with one end of a separable catch 41 as hereinafter described. The other end of said separable catch is pivotally connected to a second auxiliary latch 42 and said separable catch intermediate its ends is supported by means of a lug 43 projecting from the door 11. The latch 42 is pivotally mounted in a bracket 44 secured to the door 11 and has operative engagement with a keeper 45 fastened to the car. As in the previous embodiment a flared keeper 46 similar to the keeper 27 is employed in connection with the main latch.

It is plain from the foregoing that as the latch bar 13 swings toward the left as viewed in Figure 5 to release the doors the catch member 39, by its engagement with the separable catch member 41, will draw the latter toward the left. During this movement the separable catch will also swing upwardly because of its engagement with the lug 43 so that when the main latch and the auxiliary latch 42 are released from their keepers the catch members will be disengaged and the doors may be opened. It is apparent that the other auxiliary latch 36 will be released from its keeper during the swinging movement of the main latch. When it is desired to latch the doors they are closed, the latch bar 13 swung toward the right, the latch and the flared keeper 46 will, by their engagement, force the top of the doors inwardly and bring about correct align-

ment between the auxiliary latches and keepers so as to insure positive latching of the doors. During the movement of the latch bar the abutment portion 40 makes contact with the separable catch member 41, forcing it downwardly and to the right thereby insuring engagement between the latch 42 and keeper 45. The swinging of the bar 13 also moves the latch 36 into engagement with its keeper 38 and the doors will be fastened.

Many modifications in the details of the embodiments of the invention may be made without departing from the invention and it is intended to include therein all such modifications as fall within the scope of the claims appended hereto.

I claim:

1. A latch mechanism comprising a main swinging latch, auxiliary swinging latches on opposite sides of said main latch, connections between said main and auxiliary latches effecting simultaneous movement of said latches and keepers co-operable with said latches, said main latch engaging its keeper during moving of said latches to latching position prior to the engagement of said auxiliary latches with their corresponding keepers, said main latch keeper having means adapted to impart movement to said latches substantially normally to the swinging movement thereof.

2. The combination with a pair of overlapping swinging doors, of a main latch device swingably mounted on said overlapping door for latching said doors in closed position, auxiliary latch devices for said doors having portions extending above said doors, arms connecting said main and auxiliary devices and keepers co-operable with said latch devices, said auxiliary latch devices being engaged with and disengaged from their keepers responsive to the swinging movements of said main latch.

3. The combination with a pair of swinging doors, of main latch means for latching both said doors, auxiliary latch means for each of said doors spaced from said main latch means, connections between said latch means, whereby said auxiliary latch means will be moved to operative and inoperative positions responsive to the movement of the main latch means, and a flared keeper for each of said latch means, the keeper for said main latch means being flared to a greater extent than the keepers for said auxiliary latch means.

4. The combination with a pair of swinging doors, of a latch mechanism comprising a main swinging latch for fastening said doors, auxiliary latches on opposite sides of said main latch, connections between said main and auxiliary latches to effect simultaneous movement of said latches, keepers for the respective latches having outwardly flared portions, the flared portion of the main keeper extending a substantial distance outwardly beyond the corresponding portions of said auxiliary keepers, said flared portion of the main keeper cooperating with said main latch in certain positions of the doors to force said auxiliary latches substantially normally to said doors into alignment with the auxiliary keepers whereby they may be engaged.

5. The combination with a main swinging latch for a pivotally mounted door, of an auxiliary latch for said door, means co-operatively connecting said latches for simultaneous movement, a keeper for said auxiliary latch and means cooperating with said main latch and adapted to impart a movement to both said latches transverse to the plane in which the latches swing, whereby the auxiliary latch may be brought into alignment with said keeper.

6. The combination with a pair of swinging doors, of main latch means for latching both said doors, auxiliary latch means for each of said doors supported from said main latch means in spaced relation thereto independently of said doors, keepers for all said latch means, whereby said auxiliary latch means will be moved to operative and inoperative positions relative to said keepers responsive to the movement of the main latch means.

7. In combination, a pair of hinged doors, a swinging latch bar pivotally mounted on one of said doors for latching both said doors, a swinging latch pivotally connected to said latch bar for additionally latching one of said doors and a swinging latch for additionally latching the other of said doors, said last mentioned latch having releasable connection with said latch bar.

8. In combination, a pair of hinged doors adapted to overlap in closed position, a main latch for latching said doors, an auxiliary latch for said overlapping door, said auxiliary latch being operable by the main latch, an auxiliary latch for the other door supported thereon, separable means connecting said last mentioned auxiliary latch to said main latch and means carried by said last mentioned door to effect automatic separation of said connecting means during movement of said main latch to inoperative position.

9. In combination, a pair of hinged doors having overlapping marginal portions, a main latch mounted on the overlapping door for latching said doors, an auxiliary latch for said door connected to said main latch for movement therewith, a swinging auxiliary latch for the other door and separable means connecting said last mentioned auxiliary latch and said main latch, said connecting means comprising a member provided with a hook secured to said main latch and a lever provided with a hook pivotally secured to said auxiliary latch, the hooks of said member and said lever being in engage-

ment when said latches are in operative position.

10. In combination, a pair of hinged doors having overlapping marginal portions, a main latch mounted on the overlapping door for latching said doors, an auxiliary latch for said door connected to said main latch for movement therewith, a swinging auxiliary latch for the other door, separable means connecting said last mentioned auxiliary latch and said main latch, said connecting means comprising a member provided with a hook secured to said main latch and a lever provided with a hook pivotally secured to said auxiliary latch, the hooks of said member and said lever being in engagement when said latches are in operative position, and means automatically effecting separation of said separable means during movement of said latches to inoperative position.

11. In combination, a pair of hinged doors having overlapping marginal portions, a main latch mounted on the overlapping door for latching said doors, an auxiliary latch for said door connected to said main latch for movement therewith, a swinging auxiliary latch for the other door, separable means connecting said last mentioned auxiliary latch and said main latch, said connecting means comprising a member provided with a hook secured to said main latch and a lever provided with a hook pivotally secured to said auxiliary latch, the hooks of said member and said lever being in engagement when said latches are in operative position, and means automatically effecting separation of said separable means during movement of said latches to inoperative position, said separating means comprising a lug secured to said last mentioned door in engagement with the underside of said lever.

12. In combination, a pair of hinged doors having overlapping marginal portions, a main latch mounted on the overlapping door for latching said doors, an auxiliary latch for said door connected to said main latch for movement therewith, a swinging auxiliary latch for the other door, separable means connecting said last mentioned auxiliary latch and said main latch, said connecting means comprising a member provided with a hook secured to said main latch and a lever provided with a hook pivotally secured to said auxiliary latch, the hooks of said member and said lever being in engagement when said latches are in operative position, means automatically effecting separation of said separable means during movement of said latches to inoperative position and an abutment provided on said member engageable with said lever during movement of said main latch to operative position to effect movement of said last mentioned auxiliary latch and to restore the engagement between said hooks.

13. The combination with a pair of overlapping swinging doors, of mechanism for latching said doors, said mechanism comprising an operating bar pivotally mounted upon the overlapping door for swinging movement in a substantially vertical plane, a latch arm for each of said doors, means establishing operative engagement between said latch arms and said operating bar, said latch arms extending beyond said doors and keepers positioned beyond said doors and adapted to engage said arms.

14. The combination with a pair of overlapping swinging doors, of mechanism for latching the overlapped door comprising a vertically swingable operating bar pivotally mounted upon the overlapping door, a latching arm for said overlapped door lying in overlapping relationship thereto and extending beyond one edge thereof, a keeper positioned beyond said door adapted to have cooperative engagement with said arm and means connecting said bar and said arm.

15. The combination with a pair of swinging doors having overlapping marginal engagement, of a latch mechanism for each of said doors adapted to effect latching of the upper margins thereof, each of said latch mechanisms comprising a latch arm extending above said upper margins and a keeper positioned above said doors and adapted to be engaged by said latch arm, said latch arms being inaccessible from the normal operating position and an operating bar pivoted to said overlapping door to swing in a vertical plane, said bar being readily accessible from the normal operating position and being operable to project and retract said latch arms relative to said keeper.

16. In combination, a pair of hinged doors to overlap in closed position, a main latch for latching said doors, an auxiliary latch for said overlapping door, said auxiliary latch being operable by the main latch, an auxiliary latch for the other door supported thereon, means operably connecting the latch for the other door to said main latch for actuation thereby, said means being separable in the movement of said latches to inoperative position and adapted to reestablish operative relationship in the movement of said latches to operative position.

17. The combination with a pair of swinging doors having overlapping marginal engagement, main swinging latch mechanism for latching said doors, auxiliary swinging latch mechanism for each of said doors, said main and auxiliary latch mechanisms having swinging movement about a common center.

18. Latch mechanism for a swinging door comprising a main swinging latch member, a keeper therefor, an auxiliary latch member comprising a body portion secured to said main latch member and an arm extend-

ing at an angle to said body portion, a keeper secured to said door, a keeper secured above said door, said auxiliary latch member being swingable responsive to the swinging movement of said main latch member, said latch arm having engagement with said last mentioned keepers in the operative position of said latch members.

Signed at Chicago, Illinois, this 12th day of June, 1930.

KARL F. NYSTROM.