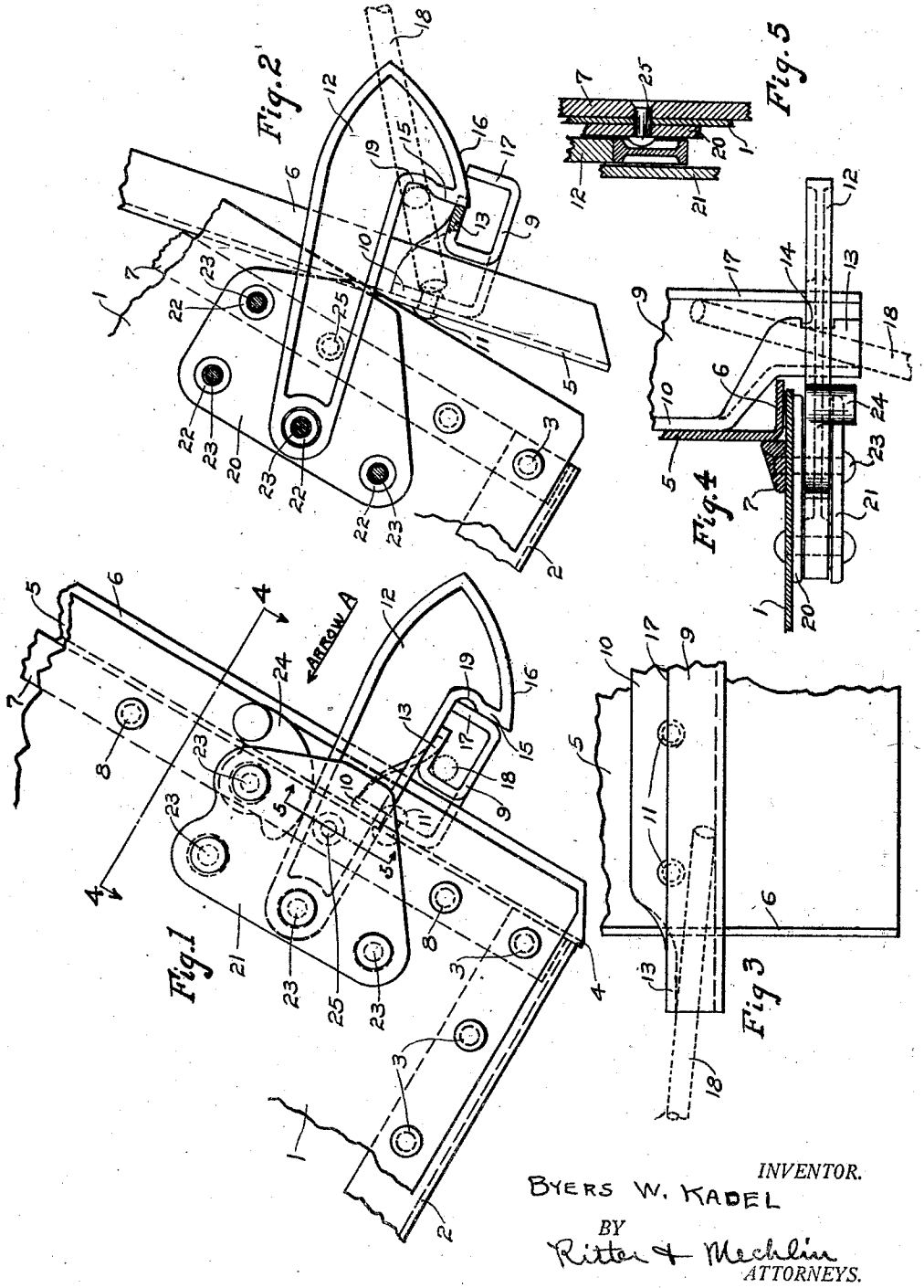
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CAR DOOR MECHANISM

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UNITED STATES PATENT OFFICE.

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CAR-DOOR MECHANISM.

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To all whom it may concern:

Be it known that I, BYERS W. KADEL, a citizen of the United States, residing at Baltimore, in the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Car-Door Mechanisms; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to door mechanism for railway cars or the like and has among its objects to provide an improved mechanism for supporting doors in partially closed or fully closed positions, and also for manually closing the doors. More specific objects are to provide a door locking mechanism having an improved arrangement of pivot bracket, and also an improved form of door arm adapted for engagement with a suitable supporting member attached to the car body. A still further object is to provide a door support-hook specially adapted for use with a door-prying lever. With such objects and others in view the invention consists of the construction, combination and arrangement of parts as will be herein described and particularly claimed.

In the accompanying drawings, which show a preferred form of the invention, Figure 1 is a fragmentary side elevational view of the hopper portion of an ordinary twin hopper car, the same being equipped with a door mechanism constructed in accordance with the principles of the present invention. In this figure the door is shown as locked in completely closed position. Figure 2 is a similar view showing the door held in a preliminary position of partial closure. In this view the outer pivot plate is removed and a portion of the door arm is shown in section for a more clear disclosure of certain features of the invention. Figure 3 is an end elevational view of a corner of a door, this view being seen in the direction of arrow "A" of Figure 1. Figure 4 is a transverse sectional view through a corner of the hopper and a portion of the door, this view being taken on the line 4—4 of Figure 1. Figure 5 is a fragmentary sectional view taken through a portion of the hopper and hook mechanism, the view being substantially on the line 5—5 of Figure 1.

Referring now to these drawings the car, which is of the twin hopper type, is constructed with an end hopper sheet 1 and a sloping floor sheet 2, the floor sheet being flanged up along its side edge and attached to the end sheet 1 by means of rivets such as 3. The lowermost edge 4 of the sheet 2, together with the side edges of the end sheets 1, define a hopper discharge opening such as is well known in the art. This opening is normally closed by means of a door 5 which is provided with outstanding flanges along certain edges, such for example as is shown for the side edge of the door at 6. A stiffening member 7 is riveted to the inner face of the sheet 1 by means of rivets 8 and serves also as a seat for the door 5. This member is preferably of tapered cross section so as to deflect the material from the car and prevent it from hanging up when the load is dumped. The door 5 is hinged to the car at a point somewhat above the rail. The hinge pintles which extend transversely of the car in the usual manner are not shown in the drawings as this construction is well known in the art.

The door 5 is supplied on its outer face and near the lower edge thereof with a transversely extending stiffening member 9 which ordinarily constitutes a door spreader for uniting two aligned doors of a pair. This arm is, in the present embodiment, formed of a special channel made up by flanging a steel plate. One flange 10 of the channel lies against the outer face of the door plate and is secured thereto by means of rivets 11. The other flange 17 extends substantially parallel with the door plate and somewhat removed therefrom. The end of the channel is carried outward somewhat beyond the side of the car to serve as a door arm for cooperation with a door supporting hook 12 which is pivotally carried upon the end hopper sheet. Where the channel 9 extends over the outstanding door flange 6 it is formed of reduced depth, the door-contacting flange 10 being offset from its normal plane to pass over the flange 6. This provides some excess metal which is turned back from the upper edge of that portion of the flanged end to provide a wall 13 lying parallel with the web of the channel 9 but spaced upwardly somewhat therefrom. This wall 13 may be notched out at its outer edge, as at 14, to accommodate and provide a seat for the ledge 15 of the hook

12. The door may be thereby held in partially closed position. In Figure 2 the hook 12 is in engagement with this portion of the door arm and the door is shown as being held in partially closed position when the parts are so engaged. It will be noted furthermore that when in this position of engagement the approach portion 16 of the hook contacts the upper edge of the outer flange 17 of the channel, so that the engagement of the hook with the wall 13 is limited by the approach portion 16 of the hook striking the upper edge of the flange 17, which latter thus forms a stop for the hook. By this means a space is provided between the wall 13 and the shank portion of the hook for the insertion of a removable door-prying lever 18 which, as shown in Fig. 2, may be caused to bear against the ledge of the hook and react against the outer face of the door to force the door shut. The portion of the hook ledge near the shank of the hook is, as indicated at 19, recessed slightly to provide a seat for the lever whereby it is prevented from slipping when so used.

The turning down of the end portion of the flange 10 to form the wall 13 also provides a socket wherein the lever 18 may be inserted to thereby constitute an extension from the end of the door spreader for use in manually moving the door from one position to another. The lever 18 is shown in this latter position in Figures 1, 3 and 4.

In order to pivot the hook 12 to the hopper end sheet 1 a pivot bracket is provided, the same comprising a base portion 20 adapted to lie directly against the hopper end sheet and an outer or cover plate 21 arranged to overlie the pivot end of the hook. The base portion 20 may be provided with spools 22, one of which forms a pintle upon which the hook is pivoted. Another of these spools may be employed as a pintle for the hook-locking cam 24. All of these spools form spacers for positioning the outer plate 21 with respect to the base 20. The spools are all pierced and rivets 23 pass therethrough and connect the outer plate to the base and also connect the entire mechanism to the hopper end sheet 1. The spool 22 which serves as a pivot for the cam 24 is located opposite the stiffening member 7 and the rivet therefor passes through this stiffening member. As the spool which constitutes the pivot for the hook is set back somewhat from the line of the stiffening member 7, it will be seen that the cam is located outwardly of the pivot point of the hook and toward the point thereof, the cam thereby serving more effectively to hold the hook in engagement with the door. When the door is completely shut the ledge 15 of the hook seats beneath the outermost flange 17 of the door arm and with the cam 24 rotated in the appropriate direction the door will be held firmly closed and will not become accidentally unlocked because of the effectiveness of the eccentric cam at the location shown. It will be noted that one of the rivets for affixing the stiffening member 7 to the hopper end sheet 1 is arranged directly behind the hook 12. This rivet is numbered 25 on the drawings and as the hook is preferably formed of I section, the resulting cavity in the inner face of the hook forms a pocket for the accommodation of the head of this rivet. By this means a full-headed rivet may be employed directly back of the hook and the rivet head furthermore constitutes a projection from the car or from the pivot bracket which serves as a limit stop to prevent the hook from dropping too far down when the door is released. The base 20 and the cover plate 21 are extended somewhat toward the edge of the hopper in order to form a guide-way for the hook so that it will not shift lengthwise along the door arm. The hook is thus prevented from creeping off the end of the arm by the restraint of the cover plate 21. At the same time the hook lies close along the edge of the car and reasonably close to the line of the door, where the force is applied to the door arm.

I have thus described a preferred embodiment of my invention. Other embodiments are contemplated within the scope of the appended claims without departing from the spirit thereof.

What is claimed is:

1. A door mechanism for railway cars including in combination with a door hinged to the car body, a pivoted member and a fixed member, one carried by the car body and the other by the door, said members having interengaging portions adapted for support of the door in closed position, the pivoted member having a depression in one of its faces, and a projection formed upon a relatively fixed portion of the car, said projection extending into the said depression of the pivoted member.

2. A door mechanism for railway cars including in combination with a door hinged to the car body, a pivoted member and a fixed member, one carried by the car body and the other by the door, said members having interengaging portions adapted for support of the door in closed position, the pivoted member having a depression in one of its faces, a pivot bracket for the pivoted member, said bracket having a projection extending from it into the said depression of the pivoted member and adapted to limit movement of the pivoted member with respect to the pivot bracket.

3. A door mechanism for railway cars including in combination with a door hinged to the car body, an arm affixed to the door and extending outward beyond an edge of

the same, an arm-engaging hook pivoted upon the car body, a pivot bracket riveted upon a face of the car and embodying a hook pivot, a rivet for affixing the bracket to the car, said rivet lying beneath the hook, and a cavity in the side of the hook adapted to admit the head of said rivet.

4. A door mechanism for railway cars, including in combination with a door hinged to the car body, a hook pivoted upon a face of the car and adapted to be swung into or out of supporting engagement with a portion of the door, a reinforcing member affixed to the car near the edge of the door, a pivot bracket for said hook affixed to the car near the edge of the door and near the said reinforcing member, the said hook having a cavity in one of its faces, and a rivet for securing the reinforcing member to the car, said rivet being located within the limits of the hook and its outer head being disposed within the said cavity of the hook.

5. A door mechanism for railway cars, including in combination with a door hinged to the car body, an arm attached to the door and extending outwardly beyond an edge of the same, the projecting end of said arm being of angular section with one leg thereof diverted out of its normal plane to form a preliminary hook seat, another portion of the arm being adapted to form a final hook seat, the preliminary seat being arranged in advance of the final seat, and a hook pivoted to the car body in position to supportingly engage either of said seats.

6. A door mechanism for railway cars, including in combination with a door hinged to the car body, an arm attached to the door and extending outwardly beyond an edge of the same, the projecting end of the arm being of channel section with one flange thereof bent out of its normal plane to a plane substantially parallel with the web of the channel, and a hook pivoted upon the side of the car and adapted to supportingly engage the diverted flange of the channel to hold the door in a preliminary position of closure and adapted to engage another portion of the said projecting end of the arm to hold the door in completely closed position.

7. A door mechanism for railway cars, including in combination with a door hinged to the car body, an arm attached to the door and extending outwardly beyond an edge of the same, the projecting end of the arm being of channel section with one flange thereof bent out of its normal plane to a plane substantially parallel with the web of the channel, and a hook pivoted upon the side of the car and adapted to supportingly engage the diverted flange of the channel to hold the door in a preliminary position of closure and adapted to engage another portion of the channel to hold the door in completely closed position, and a hook stop associated with the preliminary seat adapted to restrict the extent of engagement of the hook with said seat to less than the extent of engagement of the hook with the final seat.

8. A door mechanism for railway cars, including in combination with a door hinged to the car body, an arm carried by the door and extending outwardly beyond an edge of the same, a door-supporting member pivoted upon the car body adapted to supportingly engage the said arm, the projecting portion of said arm being of channel section with a portion of one flange thereof diverted out of its normal plane to a plane approximately parallel with and spaced slightly from the web of the channel in such manner as to provide a socket for a removable door closing member.

9. A door mechanism for railway cars, including in combination with a door hinged to the car body, a hook pivoted to the car body and adapted to supportingly engage a portion of the door, said hook having a shank portion with a door engaging ledge projecting therefrom, a portion of the ledge near its junction with the shank being recessed to provide a seat for a removable door-prying member.

In testimony whereof I affix my signature.

BYERS W. KADEL.