DOOR-LOCKING DEVICE FOR CANE CARS.


Reference is had to the accompanying drawings which illustrate the preferred form of the invention, though it is to be understood that the invention is not limited to the exact details of construction shown and described, as it is obvious that various modifications thereof within the scope of the claims will occur to persons skilled in the art.

In said drawings:

Fig. 1 is a partial side view of a cane car with my invention applied thereto, a portion of the car being broken away;

Fig. 2 is a similar view of one of the door locks shown in Fig. 1, but on a much larger scale;

Fig. 3 is a side view of the locking mechanism, as seen from the right of Fig. 2, with certain associated parts in cross-section;

Fig. 4 is a plan view of the door locking mechanism, with parts partly broken away and in section;

Fig. 5 shows a mid-section through the locking mechanism taken as indicated by the line 5-5 in Fig. 4, showing the door released and swung partly open.

My invention relates to door locks, suitable for railway car doors and the like, and especially useful for doors of general utility cars, cane cars, etc. I aim to provide a simple, convenient, effective locking mechanism; easy and inexpensive to manufacture and install; secure in action; convenient and quick in operation.

Fig. 1 shows a cane car of usual type, with side doors 9, 10 of open-work construction. The door 9 comprises a series of upright I bars 11 having their upper ends hinged or pivoted at 12 to a longitudinal top rail 13 and secured at their lower ends to a longitudinal lower rail 14 of I-bar section. The bottom rail 14 is arranged with one flange 15 turned downward (Figs. 2 and 3), and the other flange turned upward. Near their upper ends, the uprights 11 are secured to a longitudinal channel bar 16, and the door as a whole is braced by a diagonal channel bar 17, also secured to the uprights.

For holding the door 9 shut, there is provided a bar or shaft 20 extending along adjacent the lower door edge 15 and shiftable into and out of retaining position with reference to the door by means of devices 21, 21 which are mounted on the side sill 22 of the car just beyond the ends of the door. Each of these devices 21 comprises a rotary "cam" 25 somewhat resembling a steam engine eccentric. Instead, however, of being supported or carried by the shaft 20 and actuating other parts through a strap, as in a steam engine, the eccentric 25 is in the present instance supported by a bracket or housing structure 26 (riveted to the sill 22 at 27) that engages the eccentric periphery like a strap; and the shaft 20 is eccentrically mounted in and shifted by the eccentric. For this latter purpose, the eccentric 25 has a notch or recess 28 extending inward from its periphery at one side. As here shown, the shaft 20 is of rectangular (square) cross-section, and the recess 28 of like form, though affording some clearance around the shaft. The inner corners of the recess 28 are undercut in a bead or fillet at 29, as shown in Figs. 3 and 5, the key 31 not only prevents withdrawal of the eccentric 25 from the mounting or housing 26, but also as to facilitate machining. As shown in Figs. 4 and 5, the eccentric 25 has a deep circumferential groove 30 in its periphery, extending all the way around it except for an interval at the recess 28. At the base of the bracket mounting 26 adjacent the car sill 22, there is a vertical opening or hole for a key 31 to engage in the groove 30 and hold the eccentric 25 in the bracket against displacement lengthwise of the shaft 20. As here shown, this key 31 has the form of a round retaining pin with a head at its upper end, and is secured in place by means of a cotter pin key 32 through a transverse hole in its lower end, below the bracket 26. As will be apparent from comparison of Figs. 3 and 5, the key 31 not only prevents withdrawal of the eccentric 25 from the mounting or housing 26, but also serves as a stop for limiting rotation of the eccentric to about 180 degrees. The bar or shaft 20 extends loosely through the eccentric 25, and rides against the strap of the bracket 26 when below the axis of the eccentric.

When the shaft 20 in the eccentric notch 28 is in its uppermost position, as shown in Fig.
3, said shaft extends along in front of the flange 15 at the lower edge of the door 9 and holds it against the sill 22, thus securely locking the door against opening. When, on the other hand, the shaft 20 is in its lowestmost position, as shown in Fig. 5, then the shaft is well below the lower door edge 15, with ample clearance for the door to swing open above it, as shown in Fig. 5.

While various arrangements might be employed for operating the eccentric 25 to shift the shaft 20, a very simple one is to do so by rotation of the shaft 20 itself, as here shown. For this purpose, one end 33 of the shaft 20 may be bent at right angles (Fig. 1) to serve as a crank for turning the shaft. This crank 33 may conveniently be secured in upright (door-locking) position by means of a ring or link 34 on a slide 85 mounted on the end post 36 of the superstructure of the car. The crank 33 can readily be released for operation by merely lifting the link 34 over the upper end of the crank and letting this link fall to one side. To unlock the door, it is then only necessary to allow the crank 33 to swing outward and downward, thus turning the shaft 20 and the eccentric 25 and shifting the rod 20 from its position in Fig. 3 to its position in Fig. 5, as already explained. To resecure the door, the operation is reversed.

As shown in Fig. 1, the door 10 and its locking mechanism are similarly constructed and arranged, except that the door 10 extends lower and its shaft 20 and shifting devices 21d are mounted at a lower position on the sills 22, so that they may extend along the sides 20 and 21 of the door 9 to the same end post 36 from which the door 9 is controlled. To obviate any trouble from sagging of the long shafts 20 under their own weight, one of the devices 21d may be provided near the end post 36, so as to support, raise, and lower the whole end of the shaft in unison with the portion that actually engages and locks the door 10.

Various parts and features pertaining to the door 10 are marked with the same reference characters as those belonging to the door 9, as a means of dispensing with repetitive description.

What is claimed is:

1. A lock for car doors comprising a plurality of recessed eccentrics; mountings on the car frame for said eccentrics in which they are rotatable; and a bar in the eccentric recesses within said mountings, shiftable in its entirety by the eccentrics, on rotation, in front of the door to lock the latter and below said door to permit the latter to open.

2. A door lock of the character described comprising a plurality of peripherally grooved eccentrics, peripheral mountings for said eccentrics in which they are rotatable, a shaft extending through said eccentrics and shiftable by them into and out of retaining position with reference to the door, and removable keys engaged in the peripheral grooves of said eccentrics, for retaining them in their said mountings without interference with their rotation.

3. The combination of a door pivotally mounted at its upper edge whereby to swing vertically to open or closed position, of means for locking said door in closed position comprising a shaft arranged in close proximity to the lower edge of the door, and means for moving said shaft in its entirety in an arc to raise and lower the same in front of the door edge to contact with the front thereof to lock the door, and below the door edge to permit the door to open.

4. The combination of a door pivotally mounted at its upper edge whereby to swing vertically to open or closed position, of means for locking said door in closed position comprising a shaft arranged in close proximity to the lower edge of said door, and eccentrically operated supporting means for moving said shaft in its entirety in an arc to raise and lower the same in front of the door edge to contact with the front thereof to lock the door, and below the door edge to permit the door to open.

5. In a device of the kind described, means for mounting a locking shaft comprising a housing, a carrier rotatably positioned in said housing and eccentrically mounting the locking shaft, and means connecting said housing and carrier to restrain the latter against lateral movement.

6. A shaft mounting comprising a housing, a carrier rotatably mounted therein and engaging said shaft, and means connecting said housing and carrier to restrain the latter against lateral movement.

7. A shaft mounting comprising a housing, a carrier rotatably mounted therein and engaging said shaft, and a pin connecting said housing and carrier to restrain the latter against lateral movement.

8. A shaft mounting comprising a housing having aligned openings in the upper and lower portions thereof, a carrier rotatably mounted in said housing and provided with a circumferential groove, a shaft mounted in said carrier and means positioned in said openings and seated in said groove for retaining the carrier against lateral movement.

9. A lock for car doors comprising a shaft, and cam means mounting said shaft operable thereby to move said shaft inwardly in an arc in front of and below the door edge.

10. A door lock of the kind described comprising a shaft extending adjacent a door, and eccentrics on the car frame for shifting said shaft upwardly and inwardly into contact with the door to lock the latter, and downwardly away from the door to permit the latter to open.
11. In a car having a vertically swinging door, a shaft, and means secured to the car frame for mounting said shaft for swinging movement whereby said shaft may be bodily moved inwardly in an arc in front of the door to contact with the latter to lock the same, or away from the door to permit it to open.

12. A door lock of the kind described comprising a shaft extending in close proximity to the door to be secured, and eccentrics on the car frame for shifting said shaft upwardly and inwardly into contact with the door.

In witness whereof I have hereunto set my hand.

CLYDE H. FOLMSBEE.