

Feb. 14, 1950

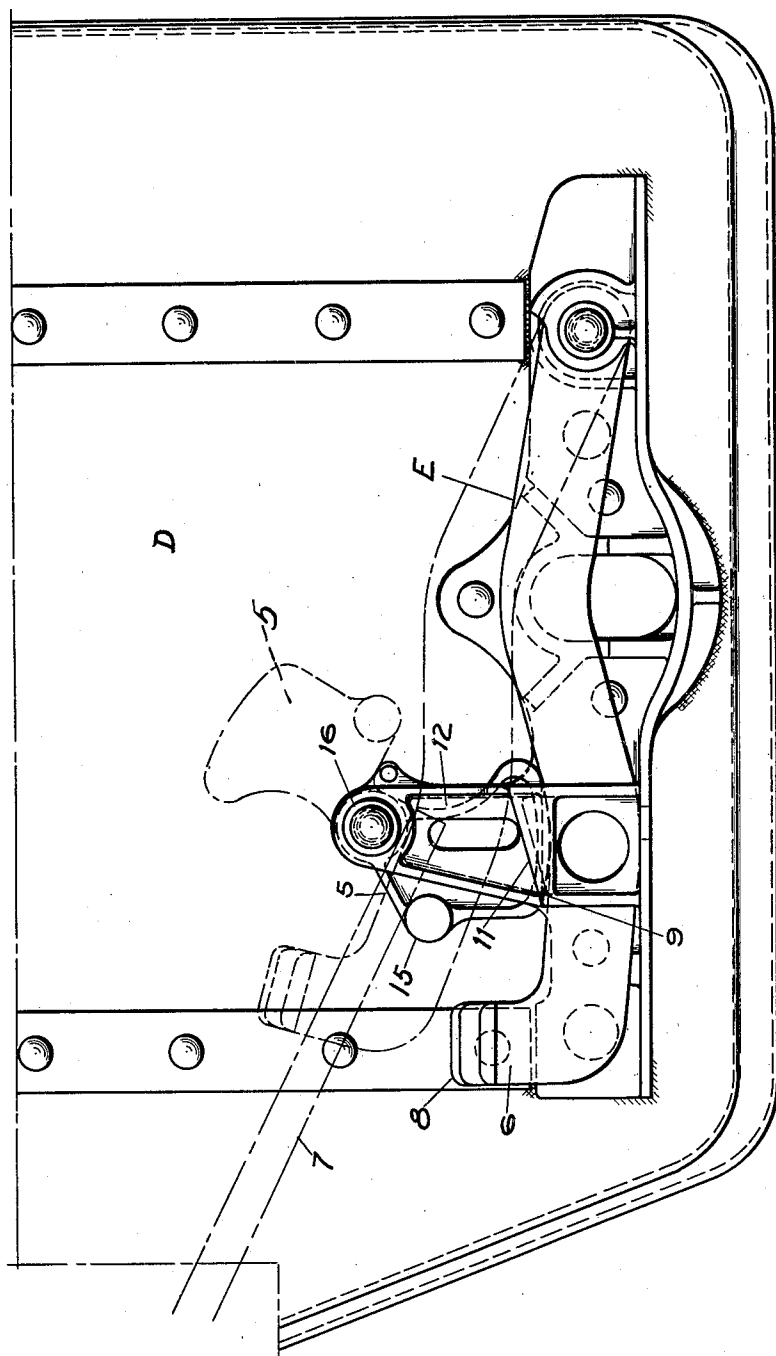
A. E. ZIMMER ET AL

2,497,284

FULCRUM FOR CAR DOOR LOCKING MEANS

Filed July 17, 1947

4 Sheets-Sheet 1



INVENTOR.
Albert E. Zimmer
BY William F. Batho
George d. Haight
ATTORNEY

Feb. 14, 1950

A. E. ZIMMER ET AL

2,497,284

FULCRUM FOR CAR DOOR LOCKING MEANS

Filed July 17, 1947

4 Sheets-Sheet 2

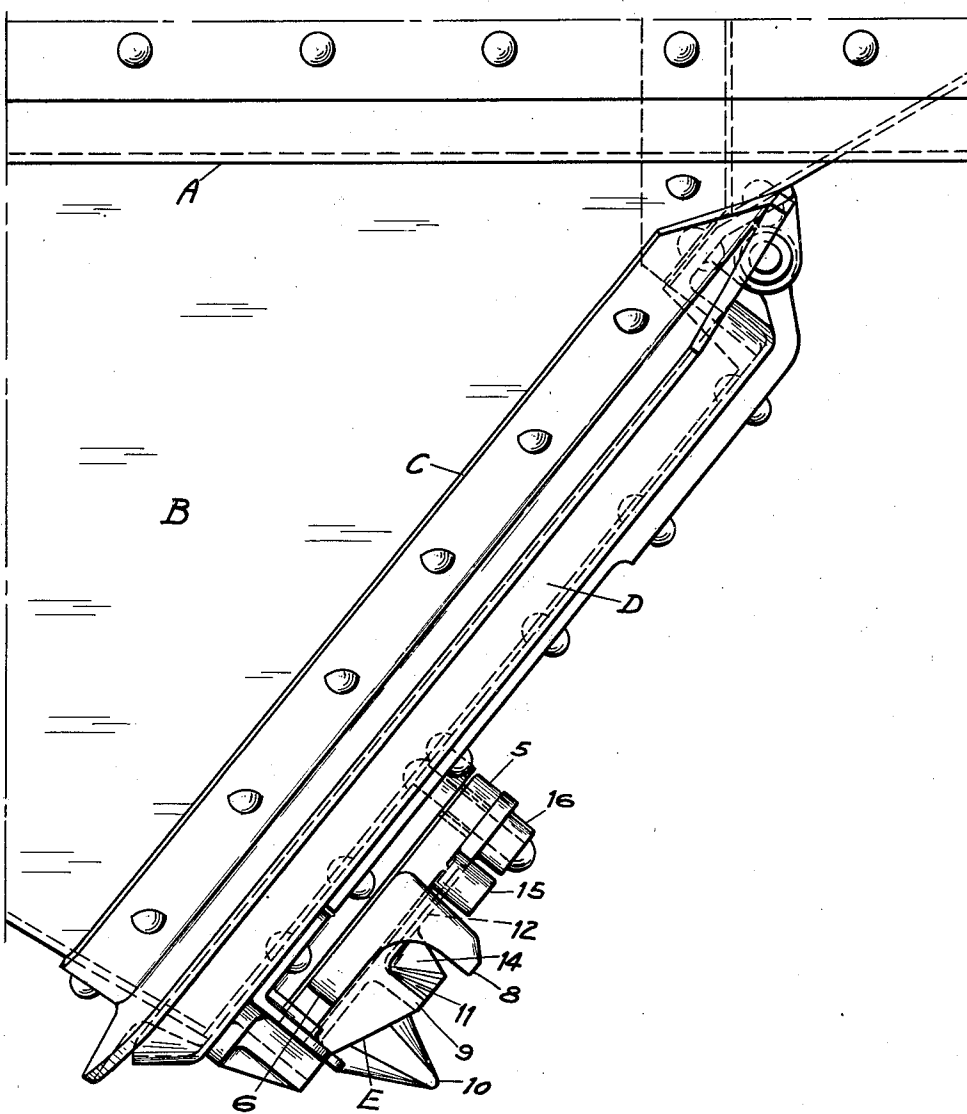


Fig-2

INVENTOR:
Albert E Zimmer
BY William F. Batho
George d. Haight
ATTORNEY

Feb. 14, 1950

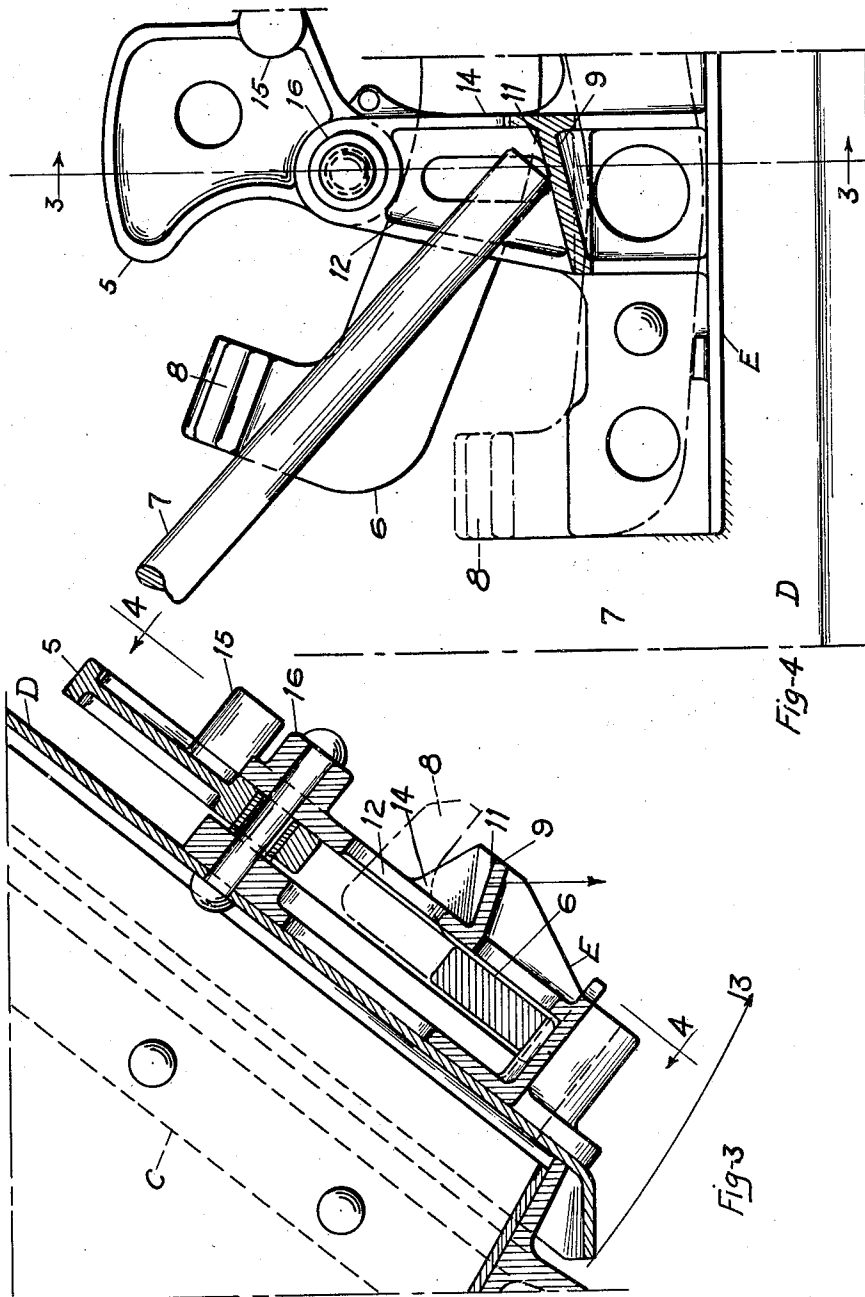
A. E. ZIMMER ET AL

2,497,284

FULCRUM FOR CAR DOOR LOCKING MEANS

Filed July 17, 1947

4 Sheets-Sheet 3



INVENTOR.
Albert E. Zimmer
William F. Batho
BY George d. Haight
ATTORNEY.

Feb. 14, 1950

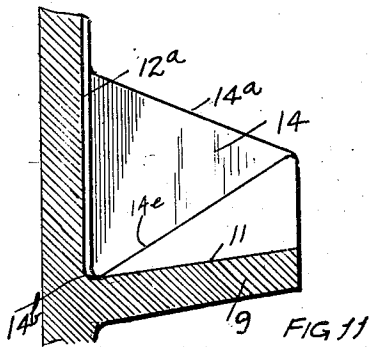
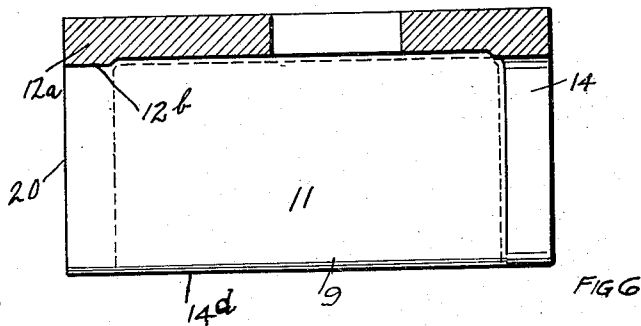
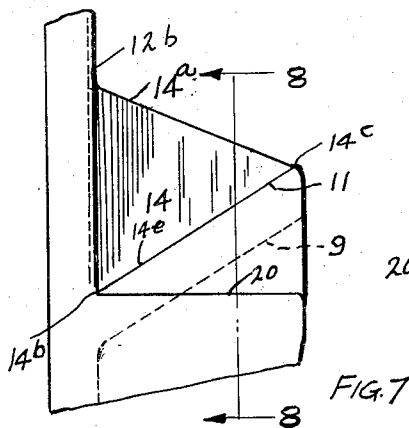
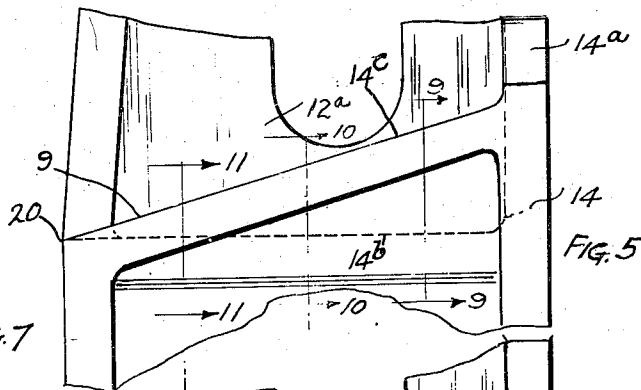
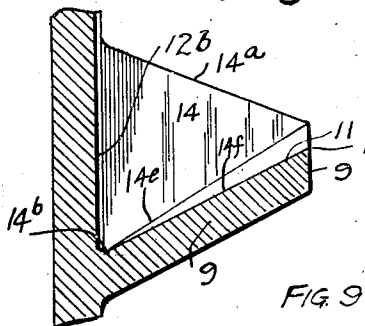
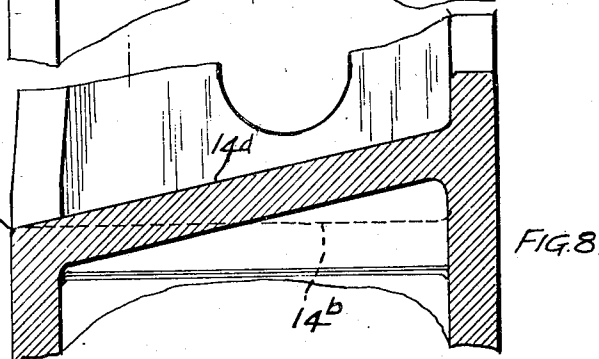
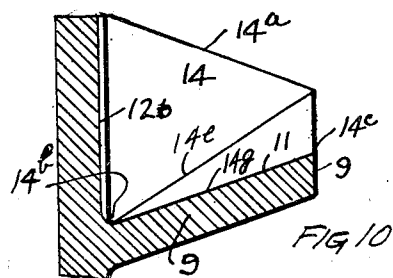
A. E. ZIMMER ET AL

2,497,284

FULCRUM FOR CAR DOOR LOCKING MEANS

Filed July 17, 1947

4 Sheets-Sheet 4



INVENTORS

ALBERT E. ZIMMER

WILLIAM F. BATHO

BY

Robert R. Lockwood

ATTORNEY

UNITED STATES PATENT OFFICE

2,497,284

FULCRUM FOR CAR DOOR LOCKING MEANS

Albert E. Zimmer and William F. Batho, Chicago, Ill., assignors to Enterprise Railway Equipment Company, Chicago, Ill., a corporation of Illinois

Application July 17, 1947, Serial No. 761,590

2 Claims. (Cl. 105—308)

1

This invention relates to improvements in railroad car door locking means. More particularly it relates to locking means for the type of car door commonly used on railroad hopper cars.

An object of this invention is to improve prior car door operating means of the type shown in U. S. Letters Patent 2,030,240 issued on February 11, 1936, to Argyle Campbell, assignor to Enterprise Railway Equipment Company. In the disclosure of the prior U. S. Patent 2,030,240 a latching bar is pivotally mounted on the car door and the parts are adapted to permit the operation of the door from a location adjacent one side of the door.

A more specific object of this invention is to improve the fulcrum means located on the door which cooperates with a fulcrum means on the latching bar so as to permit a prying open of the door. Through the applicants' improvement, a removable bar may be inserted between the fulcrum means with greater safety and convenience in opening the latch than is the case in the prior disclosed fulcrum means.

A further specific object of this invention is to provide upon the fulcrum means carried by the door a ledge or fulcrum shaped to insure that the operating bar will be securely held against slippage but will nevertheless be permitted to leave the fulcrum when the door swings free upon opening.

It is a still further object of our invention to provide a fulcrum pocket for a removable prying bar which will have an end wall to limit endwise movement of the bar and also operate to dispose the prying bar outwardly beyond the fulcrum pocket to prevent said wall functioning as a rest for the prying bar.

Other objects and features of this invention will become readily apparent from the following written description and the accompanying drawings, wherein:

Fig. 1 is a vertical front elevation of a portion of a door commonly used in a hopper car, the locked position of the locking mechanism being shown in solid lines and the unlocked position being shown in broken lines;

Fig. 2 is a vertical side elevation of the lower portion of a car showing the hopper door and adjacent related car construction in elevation;

Fig. 3 is a detailed vertical sectional view, taken on the line 3—3 of Fig. 4;

Fig. 4 is a front elevational view substantially on the line 4—4 of Fig. 3, showing some of the parts in cross sectional view for clarity and showing the position of the operating bar in the open

2

position of the locking bar in solid lines, the locked position being shown in broken lines.

Fig. 5 is an enlarged front elevational view of the fulcrum pocket;

Fig. 6 is a plan view of the pocket shown in Fig. 5, the door brace being shown in section;

Fig. 7 is a side elevational view of the fulcrum pocket shown in Fig. 6 as viewed from left to right;

Fig. 8 is a vertical longitudinal sectional view taken on line 8—8 of Fig. 7;

Fig. 9 is a transverse vertical sectional view taken through the pocket on a line 9—9 of Fig. 5;

Fig. 10 is a sectional view similar to Fig. 9 except that it is taken midway of the pocket on a line 10—10 of Fig. 5; and

Fig. 11 is another cross sectional view similar to Figs. 9 and 10 except that it is taken adjacent the open end of the pocket on a line 11—11 of Fig. 5.

The invention is illustrated as applied to a hopper car of the so-called W type as is the case in the disclosure of the Argyle Campbell Patent 2,030,240 to which previous reference has been made. As in the earlier Argyle Campbell disclosure, the underlying structure shown includes a side sill A, a side hopper sheet B, a door closing frame C, a hopper door D and hopper door locking mechanism E.

As will be noted by reference to the drawings, the door D is pivotally mounted adjacent its upper margin to swing on a substantially horizontally disposed axis. The door D includes a substantially flat body portion and is adapted to be swung or kicked to closed position to lie in an inclined position and be retained in such closed position by the door locking mechanism E. Our invention as shown is applied in connection with a latch bar 6 mounted on the outer face of the door D to swing in a plane substantially parallel with the body of the door.

The parts concerned with the door mechanism include a locking dog 5, and latch bar 6 adapted to be operated by a removable bar 7 and for this purpose prying lugs 8 and 9 are disposed on the latch bar 6 and door D respectively. The latch bar 6 is pivotally mounted adjacent the inner side edge of the door D and is extended along the swinging edge thereof towards the outer side of the door and is there provided at its outer end with the prying lug 8. Intermediate its pivotal axis and prying lug 9 the latch bar 6 engages with a shouldered keeper 10 and it is adapted to be released therefrom by raising the outer end sufficiently to clear the shoulder of the keeper

3

10. The fulcrum 9 is in the form of a shelf 11 outstanding from the door and formed integrally with a door brace 12 which is in the form of a reinforcing beam extending along the outer edge of the door D and constitutes the supporting means for the pivotal axis of the latch bar 6. That portion of the door brace 12 which actually forms the support for the shelf 9 is a vertically disposed guiding wall 12a, Fig. 5, which overlies the latch bar 6 and the dog 5.

The general structure of the disclosure may best be summarized by stating its mode of operation. Assuming the parts to be positioned as in Fig. 1, with the locking dog 5, shown by broken lines, disengaged with respect to the latch bar 6, the operator inserts the bar 7 between the prying lugs 8 and 9 and, by lifting movement on the end of the bar, causes the bar to rotate around the fulcrum 9. This lifts the latch bar 6 out of engagement with the keeper 10 of the door D, thus permitting the door to swing to an open position.

The applicants' improvement over the prior art disclosure is centered upon the operating bar fulcrum or prying lug 9. The operating bar fulcrum is formed with a shelf 11 (Fig. 3) which slopes upwardly at a slight angle not only from its inner edge adjacent the door brace 12 but also from the edge facing the lug 8 as shown more clearly in Figs. 5 through 11 and described hereinafter, whereas the fulcrum shown in the prior Campbell Patent 2,030,240, element 60, is merely a lug extending outwardly at right angles to the face of the mechanism. Because of the angular position of the door in its closed and locked position, the operating bar has a tendency to slip off the prying lug shown in this patent when force is applied to raise the latch bar out of engagement with the keeper in opening the door.

In the present disclosure the operating bar rests upon the inclined shelf 11 and tends to hug the face of the door brace 12 thereby preventing slippage of the bar when force is applied to pry the latch bar open. As the door swings open in the direction of arrow 13 the slight angle of shelf 11 in no way interferes to prevent the bar from sliding off the shelf. This insures safety to the operator.

There is also incorporated a wall 14 at the forward edge of the shelf 11 which prevents the operating bar from slipping forward while under pressure or from being placed so far forward as to defeat the intended purposes of the fulcrum shelf.

In order to prevent the prying bar 7 from resting on the end wall 14, its upper edge is inclined outwardly and downwardly from the front face of the door D, as indicated at 14a, Fig. 7, thereby reducing the likelihood that this upper surface 14a of the end wall 14 will be used as a fulcrum. If the prying bar 7 should rest on the inclined surface 14a and an attempt were made to move the latch bar 6 to the open position, the prying bar 7 will slide off of this surface. Thus, it is necessary to place the end of the pry bar 7 on the shelf 11 in the intended manner where its movement on the release of the latch bar 6 is positively determined and controlled by the shape and location of the upper surface thereof.

The location and disposition of the upper surface of the shelf 11 in relation to the latch bar 6 and associated parts will be understood more clearly by reference to Figs. 5 to 11 inclusive. As there shown the shelf 11 has its upper surface inclined upwardly and outwardly away from the

4

front face of the door D to provide in combination with the outer surface 12b of the guiding wall 12a a substantially V-shaped pocket extending lengthwise of the latch bar 6.

The angular relationship between the respective walls of this V-shaped pocket varies from a sharp acute angle at the closed end of the pocket adjacent to the wall 14, Fig. 9, to present an ever widening angle toward the open end of the pocket at which location, Fig. 7, the upper surface of the shelf 11 is disposed in right angular relation to the surface 12b. The apex of this V-shaped pocket extends along a substantially horizontally disposed straight line 14b and, owing to the constantly varying degree of inclination in two planes, the upper surface of the shelf 11 slopes downwardly toward the open end edge 20 of the pocket as indicated by the sloping edge 14c, Fig. 5, and the intermediate sloping line 14d, Fig. 8, and the lines 14e-f-g in Figs. 7, 9 and 10 respectively. The downward inclination in the two planes as indicated by the sloping lines 14c-d-e-f-g thus being in a direction opposite to the upward movement of the latch bar 6 in its releasing motion, results in a wide upward sweep of the pry bar 7 during its movement to release the latch bar 6 as is illustrated in Fig. 4. With the pry bar 7 in the position here indicated, the angularity between it and the inclined shelf surface is approximately sixty degrees so that the end of the pry bar 7 on the shelf 11 is in position to slip outwardly along the same and out of engagement therewith. It will now be appreciated that the location and shape of the upper surface of the shelf 11 operates to release the pry bar 7 in the direction of movement of the latch bar 6 as well as in the direction of swing of the door D to the open position.

The pivoted dog 5 is provided for maintaining the latch bar 6 in locked position. The dog 5 has a lug or projection 15 which is used to form a fulcrum for the operating bar 7 when forcing the dog into its locked position indicated by solid lines. A cooperating lug 16 is mounted on the door brace 12. The locking bar, indicated in broken lines, is placed under the lug 16 and over the lug 15 to obtain the necessary leverage. The lug 16 may also be used in this same manner to force the latch bar 6 into locked position, although in ordinary practice this is more often done by striking the lug 8 of the latch bar 6 with the operating bar 7, or with a sledge. For withdrawing the dog 5, the foregoing procedure is reversed.

While the specification discloses and describes a preferred embodiment of this invention, the same is merely illustrative and the applicants claim all constructions coming within the scope of the claims appended hereto.

The applicants claim:

1. In a door latching device including a door hinged along its upper side and swingable about a horizontal axis to and from a closed position inclined to the vertical and biased therefrom by gravity to a vertical open position, a latch bar for holding the door closed, the latch bar being pivotally mounted on the door to swing parallel to its outer side and toward its hinge axis to released position, a prying lug carried by the door and another prying lug carried by the latch bar, the two prying lugs being adapted to accommodate a prying bar inserted therebetween for unlatching the latch bar, the improvement which comprises a shelf integral with said prying lug carried by the door and adapted to form a

5

rest for one end of said prying bar, the upper surface of said shelf being inclined upwardly with respect to the outer side of the door and forming therewith an acute angle opening to receive said end of said bar with a wedging action whereby said bar is prevented from laterally slipping off said prying lug carried by the door when force is applied thereto by said bar to unlatch the latch bar, and a vertical wall integral with said shelf on the end away from said prying lug carried by said latch bar to prevent the prying bar from longitudinally slipping past said end.

2. In a door latching device including a door hinged along its upper side and swingable about a horizontal axis to and from a closed position inclined to the vertical and biased therefrom by gravity to a vertical open position, a latch bar for holding the door closed, the latch bar being pivotally mounted on the door to swing parallel to its outer side and toward its hinge axis to released position, a prying lug carried by the door and another prying lug carried by the latch bar, the two prying lugs being adapted to accommodate a prying bar inserted therebetween for unlatching the latch bar, the improvement which comprises a shelf integral with said prying lug carried by the door and adapted to form a rest for one end of said prying bar, the upper

6

surface of said shelf being inclined upwardly with respect to the outer side of the door and forming therewith an acute angle opening to receive said end of said bar with a wedging action whereby said bar is prevented from laterally slipping off said prying lug carried by the door when force is applied thereto by said bar to unlatch the latch bar, and a vertical wall integral with said shelf on the end away from said prying lug carried by said latch bar to prevent the prying bar from longitudinally slipping past said end, the upper edge of said vertical wall being inclined outwardly and downwardly with respect to the outer side of said door whereby said prying bar if applied thereto will slide off of the same and it will not function as a fulcrum therefor.

ALBERT E. ZIMMER.

WILLIAM F. BATHO.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,755,529	Wine	Apr. 22, 1930
2,011,470	Campbell	Aug. 13, 1935
2,030,240	Campbell	Feb. 11, 1936