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H. I. JONES ET AL

SLEEPING CAR LADDER

Filed March 14, 1925

2 Sheets-Sheet 1

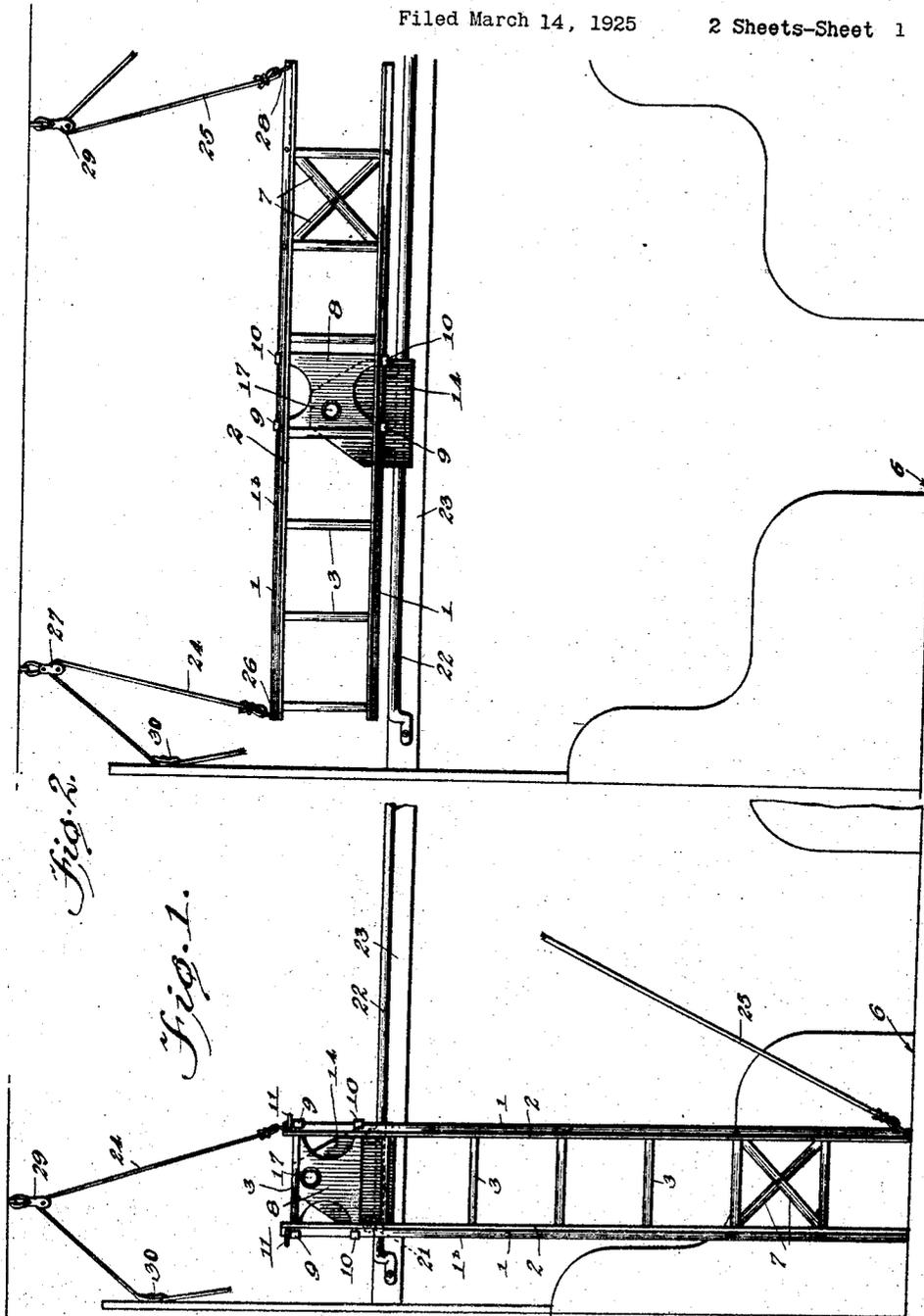


Fig. 2.

Fig. 1.

WITNESSES

Lawrence D. ...
...

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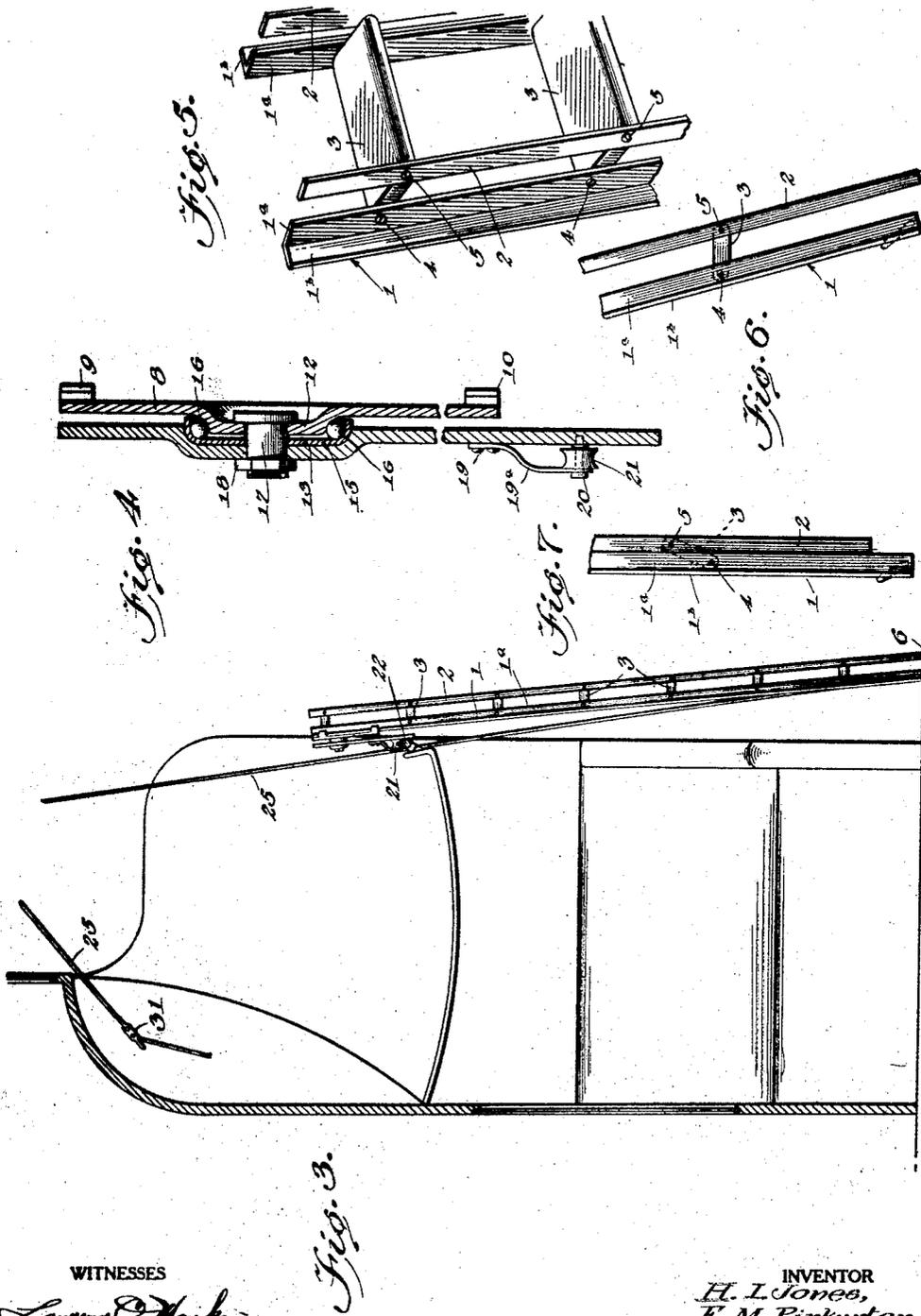
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WITNESSES

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Fig. 3.

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UNITED STATES PATENT OFFICE.

HILTON IRA JONES AND FLORA M. PINKERTON, OF WILMETTE, ILLINOIS.

SLEEPING-CAR LADDER.

Application filed March 14, 1925. Serial No. 15,624.

To all whom it may concern:

Be it known that we, HILTON I. JONES and FLORA M. PINKERTON, citizens of the United States, and residents of Wilmette, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Sleeping-Car Ladders, of which the following is a specification.

Our invention relates to improvements in sleeping car ladders, and it consists in the combinations, constructions and arrangements herein described and claimed.

An object of the invention is to render the upper berth of a railway sleeping car conveniently accessible and to prevent an occupant of the upper berth, as a child, from falling accidentally from the berth.

A more specific object of the invention is to provide a simple, economical and practical structure, applicable to a usual part of a conventional sleeping car construction and which in one active position provides a strong ladder between the floor of the sleeping car and an upper berth, in another active position serves as a guard railing for the upper berth, and when in inactive position can be disposed flatwise beneath the usual mattress in the upper berth.

Other objects and advantages of the invention will be apparent from the following description, considered in conjunction with the accompanying drawings, in which:

Figure 1 is a side elevation of a portion of the internal structure of a railway sleeping car, showing the improved ladder in position between an upper berth and the floor of the car.

Figure 2 is a view similar to Figure 1, showing the ladder in position as a guard railing for the upper berth.

Figure 3 is a transverse vertical section through the structure exhibited in Figures 1 and 2, showing the ladder in elevation and illustrating the means for supporting the ladder on the usual hand rail of the upper berth.

Figure 4 is a relatively enlarged fragmentary vertical section of cooperative plates of the means for supporting the ladder for turning movement about a horizontal axis between the positions illustrated in Figures 1 and 2, respectively.

Figure 5 is a fragmentary perspective view of a portion of the ladder in expanded position.

Figure 6 is a side elevation of another

fragmentary portion of the ladder in expanded position, and

Figure 7 is a view similar to Figure 6, showing in folded position the portion of the ladder exhibited in Figure 6.

The improved ladder comprises a pair of main frame members 1, each of which is right angular in cross section, and a pair of auxiliary or secondary frame members 2 in the form of bars preferably of the same length as the members 1. Corresponding flanges 1^a of the angle members 1 are held parallel each with the other and are secured to spaced substantially rectangular cross members or steps 3 by pivot elements 4 which are connected to the cross members 3 adjacent to the rearward longitudinal edges of the latter. The arrangement is such that the second flanges indicated at 1^b of the angle members 1 are disposed at the rearward edges of the parallel flanges of the angle members and extend laterally outward from their lines of junction with the flanges 1^a. A pair of the pivot elements 4 is provided for each cross member 3 and each cross member 3 is connected by a second pair of pivot elements 5 to the secondary ladder frame members or bars 2, the pivot elements 5 being connected with the ends of the cross members adjacent to the front longitudinal edges of the cross members. When the ladder is inclined slightly to the rearward from the perpendicular, and the angle members 1 and the bars 2 rest upon a horizontal surface, as the sleeping car floor 6, in Figures 1 and 3, the cross members 3 will be disposed flatwise and the bars 2 will be spaced from the flanges 1^a of the angle members 1. The angle members 1 may be braced and stayed to each other by crossed and connected diagonal brace members 7. The bars 2 and the cross members 3 can be swung upward from the position shown to advantage in Figures 5 and 6 about the axis of pairs of alined pivot elements 4 to folded position, as illustrated in Figure 7, each bar 2 then being flatwise against the edge of the flange 1^a of the corresponding ladder frame member 1.

The flanges 1^b of the ladder frame members 1 are held in flatwise sliding contact with an attaching plate 8 by spaced pairs of transversely alined guiding and retaining angular lugs 9—9 and 10—10 respectively, on the outer face of the plate 8, there being a lug 9 and a lug 10 for each flange

1^b and each lug 9 or 10 extending inwardly across the edge of the adjacent flange 1^b and engaging with the upper face of that flange. Stops 11 at the upper ends of the members 1 limit the sliding movement of the ladder frame members 1 in one direction on the attaching plate 8.

The central portion of the plate 8 is offset rearwardly, as indicated at 12, and extends into a ball race member 13 which fits in a socket in the upper end portion of a carrying plate 14. The ball race member 13 and the marginal edge portion of the rearwardly offset portion 12 of the attaching plate 8 are formed with cooperative annular grooves constituting a race or runway, indicated at 15 for ball bearings 16. Alined central openings in the rearwardly offset portion 12 of the plate 8 and in the plate 14 receive a pivot element which may be a bolt 17 which has a nut 18 engaged with the free end portion of the shank thereof, whereby the plate 8 is held close to the plate 14 and the ball bearings 16 are held against displacement from the ball race 15.

Brackets 19 secured on the rearward face of the lower edge portion of the plate 14 have arms, as 19^a shown in Figures 3 and 4, spaced from the plate 14 and cooperating with the plate 14 to support horizontal shafts 20 on which rollers 21 are supported between the arms 19^a and the plate 14. The rollers 21 may have circumferential grooves in their peripheries as shown and are adapted to engage and have rolling contact with the usual horizontal hand rail 22 on the supporting frame 23 of the upper berth of a sleeping car of ordinary construction. Ladder operating cables 24 and 25 respectively, are provided. The cable 24 is secured at one end to an attaching element 26 at one end of one of the members 1 of the ladder frame and then is passed through an overhead sheave 27 which is suspended from the ceiling of the sleeping car structure. The cable 25 is secured at one end to an attaching element 28 at the opposite end of said one member 1 of the ladder frame and then is passed through an overhead sheave 29 which also is secured to the ceiling structure of the sleeping car.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. The engagement of the peripherally grooved rollers 21 with the hand rail will cause the ladder to be firmly supported at its upper end on the frame of the upper berth when the ladder rests at its lower end on the floor of the sleeping car, as in Figures 1 and 3, and the ladder therefore can be used safely for passage between the upper berth and the floor of the sleeping car. When the passenger has ascended the ladder to the upper berth, the plates 8 and 14 can be moved

easily on the rollers 21 from the position shown in Figure 1 to a position approximately midway of the hand rail 22 and the cable 25 then can be manipulated to swing the lower end of the ladder upward from the position shown in Figures 1 and 3 to the position shown in Figure 2, the plate 8 turning anti-frictionally on the plate 14. The ladder will be retained in the position shown in Figure 2 when the free ends of the cables 24 and 25 are detachably fastened to clips as at 30 and 31, respectively. The clips 30 and 31 are secured to opposite ends of the frame structure of the opposite berth. The ladder when in the position shown in Figure 2 serves as a guard railing for preventing an occupant of the upper berth from falling from the upper berth. It will be understood that the ladder can be lowered from the position shown in Figure 2 to the position shown in Figures 1 and 3 merely by reversing the operation just described. The ladder has a length less than that of the upper berth, and therefore when the latter is "made up" and the ladder is not in use, the ladder may be swung inwardly and downwardly from the position shown in Figure 2 into the upper berth and disposed flatwise in the upper berth underneath the usual mattress, not shown.

Our improved ladder renders an upper berth available for use by women who can ascend to and descend from the berth when desired without attracting attention by summoning a porter to bring the usual sleeping car ladder, and moreover the ladder when in position to serve as a guard railing renders the upper berth safe for the use of an occupant, as a child, who might otherwise fall or be thrown from the upper berth. The benefit of better ventilation, and the other advantages of an upper berth therefore may be obtained when our sleeping car ladder is employed without the features of disadvantage heretofore incident to the use of an upper berth.

Our invention is susceptible of embodiment in forms other than that which is illustrated in the accompanying drawings, and we therefore consider as our own all such modifications and adaptations thereof as fairly fall within the scope of the appended claims.

We claim:—

1. A ladder of the character described, comprising a pair of parallel elongated frame member, a plate having cooperative guiding and retaining lugs engaging with the frame members to retain said frame members in lengthwise sliding contact with the outer face of the plate, a second plate, means pivotally attaching the first plate to the second plate so that the first plate can turn in its plane on the second plate, and

rollers carried by the second plate for movably supporting it and the parts which are connected therewith on a horizontal rail.

2. A ladder of the character described, comprising a pair of parallel elongated frame members, a plate having cooperative guiding and retaining lugs engaging with the frame members to retain said frame members in lengthwise sliding contact with the outer face of the plate, a second plate, means pivotally attaching the first plate to the second plate so that the first plate can turn in its plane on the second plate, rollers carried by the second plate for movably supporting it and the parts which are connected therewith on a horizontal rail, and anti-friction elements spacing said first plate from said second named plate.

3. A ladder of the character described, comprising a pair of parallel elongated frame members, a plate having cooperative guiding and retaining lugs engaging with the frame members to retain said frame members in lengthwise sliding contact with the outer face of the plate, a second plate, means pivotally attaching the first plate to the second plate so that the first plate can turn in its plane on the second plate, rollers carried by the second plate for movably supporting it and the parts which are connected therewith on a horizontal rail, and cables attached to opposite ends of said ladder for swinging the latter about the axis of the pivotal connection between said plates and for securing said ladder in a predetermined position.

4. A ladder comprising a pair of elongated main frame members, each angular in cross section, substantially rectangular cross members each pivotally attached at its ends adjacent to one longitudinal edge thereof to parallel flanges of said frame members, the other flanges of said frame members extending laterally outward from their lines of junction with the outer edges of the parallel flanges, a pair of secondary frame members pivotally attached to the ends of the cross members adjacent to the second longitudinal edges of said cross members and swingable toward and away from said main frame members, said second frame members and said main frame members being approximately equal in length, an attaching plate having guiding and retaining lugs in engagement with the second named flanges of said main frame members, a carrying plate, a pivot element attaching the attaching plate to the carrying plate and extending

substantially at right angles to the planes of said plates, and means on said carrying plate for movably supporting the latter on a horizontal rail.

5. A ladder comprising a pair of elongated main frame members, each angular in cross section, substantially rectangular cross members each pivotally attached at its ends adjacent to one longitudinal edge thereof to parallel flanges of said frame members, the other flanges of said frame members extending laterally outward from their lines of junction with the outer edges of the parallel flanges, a pair of secondary frame members pivotally attached to the ends of the cross members adjacent to the second longitudinal edges of said cross members and swingable toward and away from said main frame members, said second frame members and said main frame members being approximately equal in length, an attaching plate having guiding and retaining lugs in engagement with the second named flanges of said main frame members, a carrying plate, a pivot element attaching the attaching plate to the carrying plate and extending substantially at right angles to the planes of said plates, means on said carrying plate for movably supporting the latter on a horizontal rail, and stops on said main frame members for engaging with certain of said guiding and retaining lugs to limit the sliding movement of said ladder on said attaching plate.

6. In combination, a ladder including a pair of spaced parallel elongated frame members, an attaching plate having guiding and retaining lugs on the face thereof engaging with said frame members for holding said ladder in lengthwise sliding contact with the attaching plate, said attaching plate having the central portion thereof rearwardly offset, a carrying plate having a socket receiving said rearwardly offset portion of the attaching plate, a pivot element connecting said plates and having an axis extending through the center of the rearwardly offset portion of the attaching plate, said attaching plate and said carrying plate having cooperative means producing a ball race concentric to said pivot element, ball bearings in said ball race, and rollers on the carrying plate, the axes of said rollers being parallel to the axis of said pivot element.

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