April 6, 1948. M. M. FARMER 2,439,163

INVALID TRANSFER DEVICE

Filed Sept. 18, 1946 2 Sheets-Sheet 1

FIG. 1.

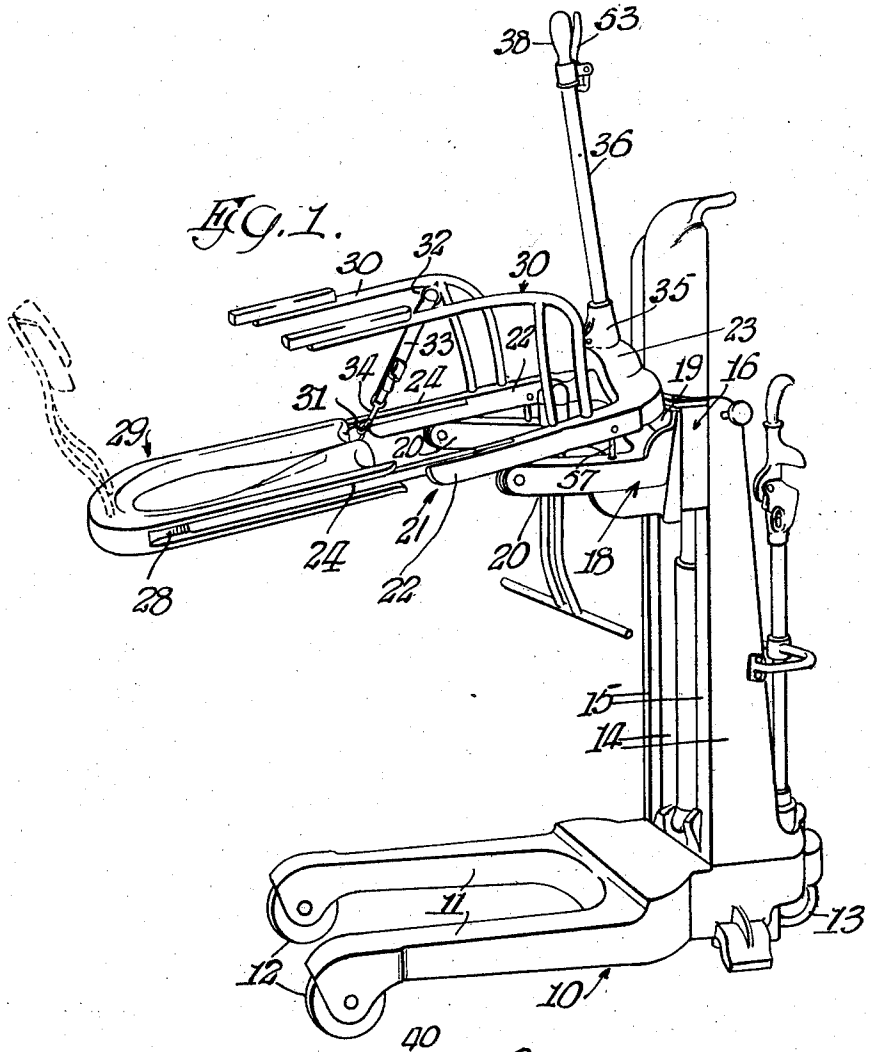
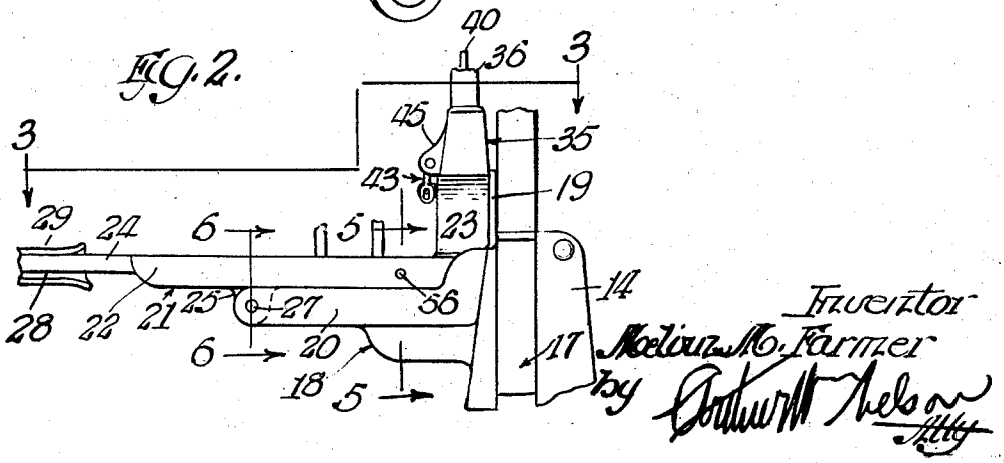


FIG. 2.



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INVALID TRANSFER DEVICE

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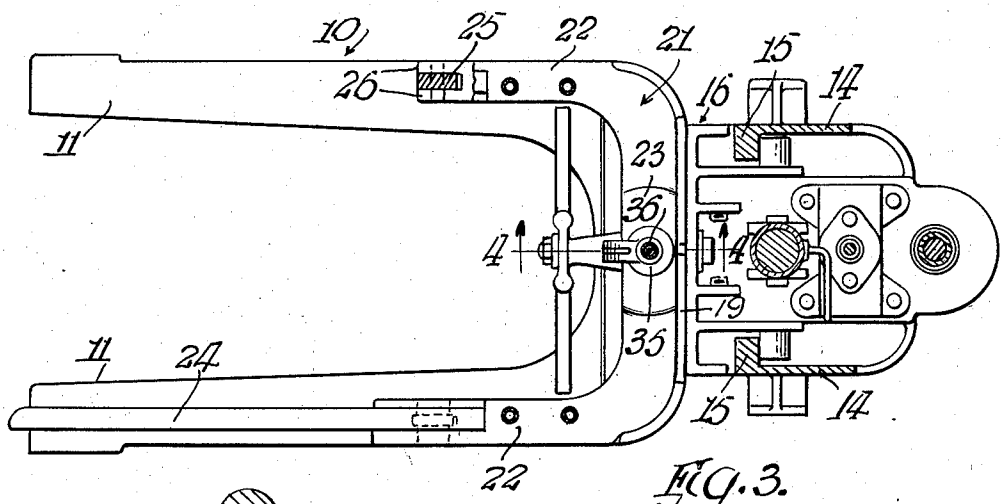


FIG. 3.

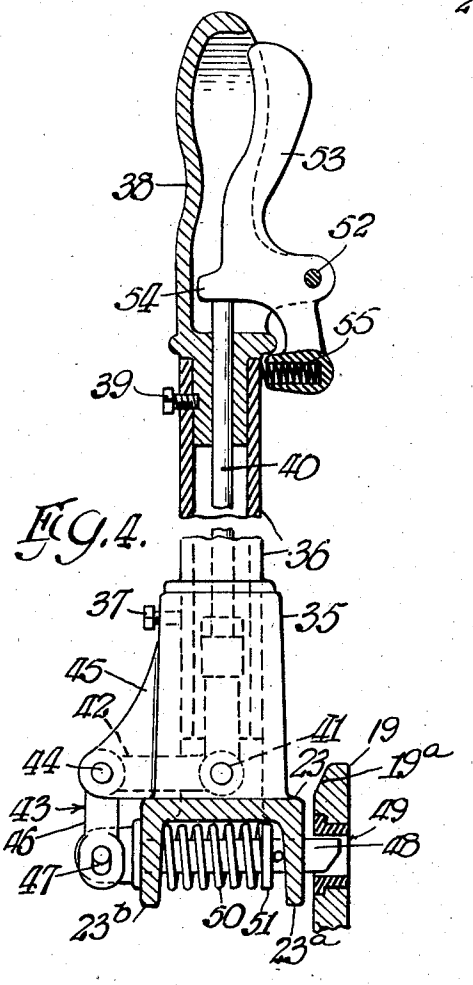


FIG. 4.

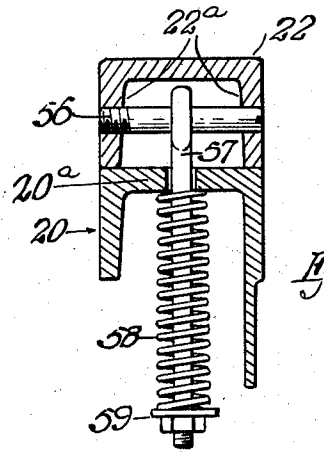


FIG. 5.

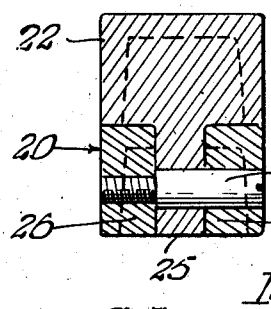


FIG. 6.

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Patented Apr. 6, 1948

2,439,163

UNITED STATES PATENT OFFICE

2,439,163

INVALID TRANSFER DEVICE

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Application September 18, 1946, Serial No. 697,656

13 Claims. (Cl. 5—86)

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This invention relates to improvements in invalid transfer devices and it consists of the matters hereinafter described and more particularly pointed out in the appended claims.

The invention is more especially concerned with devices of this kind that include an upright supporting means having a carriage capable of a raising and lowering movement thereon and carrying rearwardly disposed horizontal rails for detachable sliding engagement with the sides of a seat occupied by an invalid for a transfer of the invalid, in a seated condition, from a bed to a chair or the like. Devices of this kind are illustrated and described in my prior United States Patents 2,375,907 and 2,375,908.

In the use of such device, for transferring an invalid from a bed to a chair or the like, the seat associated with the device, which may be of the kind shown in my prior United States Patent 2,380,012, is placed upon the bed at the back of the invalid, after the latter has been turned upon his side. The invalid is then rolled over upon the seat and is caused to sit up thereon and the seat is then turned into a position transversely of the bed and moved thereon closer to one side thereof than the other. In this position the seat is somewhat tilted upwardly out of the horizontal plane toward said side of the bed because the weight of the user is concentrated, to a greater extent, at the rear of the seat than elsewhere. In the devices of my patents, before mentioned, the rails thereof engage the seat from opposite sides thereof and are disposed rigidly in a horizontal plane. Hence it is difficult to engage said horizontal rails with the sides of the seat when in its upwardly tilted position.

One of the objects of the invention is to provide an improved but simple structure, in a device of this kind, whereby the seat supporting rails on the carriage may be readily tilted into an inclined position relatively to the carriage of the device and whereby said rails may be readily engaged with the invalid occupied seat when in an inclined position upon a bed, whereby the said rails and seat may be tilted back to and releasably locked in a horizontal position wherein the seat clears the bed to permit easy removal.

Another object of the invention is to provide, in a structure of this kind, seat engageable rail supporting mechanism that includes an actuating lever for tilting the rails from and to a horizontal position relative to the carriage, and which carries parts whereby said rails may be releasably locked to the carriage against tilting out of the horizontal position.

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A further object of the invention is to provide, in a device of this kind, means which cushion the tilting movement of the seat engageable rails whereby such movement is relatively slow and easy so that when the seat is occupied by an invalid, jars or shocks are not imparted to the invalid when returning the seat to the bed.

Also, it is an object of the invention to provide, in a device of this kind, simple and easily operated mechanism, whereby the seat is held against sliding outwardly on the rails when the latter are in the downwardly and rearwardly tilted condition.

The above mentioned objects of the invention, as well as others together with the advantages thereof will more fully appear as the specification proceeds.

In the drawings:

Fig. 1 is a perspective view of an invalid transfer device embodying the preferred form of the invention, with the seat supporting rails in a downwardly and rearwardly tilting condition.

Fig. 2 is a fragmentary view in side elevation of parts appearing in Fig. 1 with the seat supporting rails in their normal horizontal position.

Fig. 3 is a horizontal sectional view through a part of the device as taken on the line 3—3 and on a scale somewhat enlarged over that of Fig. 2.

Fig. 4 is a detail vertical sectional view through the tilting lever and locking mechanism for the seat supporting rails as taken on the line 4—4 and on a scale enlarged over that of Fig. 3.

Fig. 5 is a detail vertical sectional view through a part of the improved device, on a further enlarged scale as taken on the line 5—5 of Fig. 2 and more fully shows the mechanism for cushioning the rocking action of the rails from the normal horizontal position to the downwardly and rearwardly tilted position.

Fig. 6 is a vertical detail sectional view through another part of the improved device on the scale of Fig. 5 and as taken on the line 6—6 of Fig. 2 and more fully shows the pivotal connection between the means that support the seat supporting rails and supporting arms therefor on the carriage and which will be more fully referred to later.

As before mentioned, the improved device generally follows the structure in my previously mentioned patents. Therefore, only those parts germane to the present invention will be referred to in detail, and the remainder of said parts will

be referred to only in general, as they are fully shown and described in said patents.

Referring now in detail to that embodiment of the invention illustrated in the drawings, 10 indicates as a whole the horizontally disposed base of the device that includes laterally spaced rearwardly extending legs 11. These legs are provided at their rear ends with wheels 12—12 which in connection with a similar and steerable wheel 13 at the front of the base, makes the device readily movable from one place of use to another.

Rising from that portion of the base at the front end thereof is a pair of laterally spaced upright standards 14—14, each provided along its rear margin with a vertical guide rail 15.

A carriage, indicated as a whole by the numeral 16, is mounted on the standards 14—14 for a guided movement upwardly and downwardly upon the rails 15—15. The manner of mounting said carriage on said standard and the mechanism for imparting movement to said carriage on the rails on said standard are fully illustrated and described in my prior Patents 2,375,907 and 2,375,908 respectively and therefore need not be mentioned in further detail herein.

This carriage has a horizontally disposed bracket 18 mounted on the rear side thereof. Said bracket, which in plan is of a U shape, is formed at the front with an upright flange 19 and includes laterally spaced horizontally disposed legs 20—20 respectively,

Arranged above this bracket 18 is a somewhat elongated U shaped frame 21 that includes laterally spaced side legs 22—22 adapted to engage upon the legs 20 when in one position. The front end of the legs 22—22 are connected by a bridge piece 23, which when the frame 21 is in its horizontal position, is disposed upon that part of the bracket 18 to the rear of the flange 19. Fixed to and extending rearwardly from the legs 22 of the frame 21 is a pair of rearwardly extending seat supporting rails 24—24.

Each leg 22 of the frame 21 is provided toward the rear end with a depending ear 25 and said ear fits between spaced ears 26 (see Fig. 6) at the rear end of an associated arm 20 and to which it is pivotally connected by a pin 27. These pins serve to pivotally mount the frame 21 upon the bracket 18 for a rocking movement from the horizontal position shown in Fig. 2 to the tilted position shown in Fig. 1.

The rails 24—24 are adapted to be engaged with and be withdrawn endwise from associated channels 28—28 in opposite sides of the invalid's seat member 29, only one of such channels appearing in Fig. 2. This seat member is fully illustrated and described in my United States Patent 2,380,012, before referred to.

Each leg 22 of the frame 21 is provided with a removable arm rest 30. Said arm rest is disposed above the associated leg and extends somewhat rearwardly of the rear end thereof to be located above the associated rail 24, in a position convenient for the occupant of the seat 29. At the front of one side of the seat is a ring 31 and a second ring 32 is fixed to a part of the arm rest 30 on the same side of the device. The ring 32 has one end of an adjustable strap 33 connected thereto and the other end carries a snap hook 34 for detachable connection with the ring 31 on the seat. By means of the parts just above mentioned and best shown in Fig. 1, the seat 29 is prevented from sliding outwardly and downwardly on the rails 24 when the latter are in the inclined position shown in Fig. 1. When it is desired to produce a separation between said rails and said seat, the snap hook 34 may be unfastened from the ring 31.

It is obvious that the frame may be readily rocked from one position to the other. However, when the seat is engaged in supporting relation upon said rails and is occupied by an invalid, the rocking movement of said bracket from one position to the other requires considerable effort on the part of the operator and therefore means is provided to facilitate such movement.

Rising from the central part of the bridge 23 on the longitudinal medial line of the device as a whole, is an upright hollow boss 35 to which the bottom end of a tubular lever 36 is fixed by a set-screw 37 to stand perpendicularly to the plane of the frame 21. The top end of said lever is provided with a hollow handle 38 fixed thereto by the set screw 39. Guided in the lower part of the handle 38 is the upper end of an actuating rod 40 and the lower end of this rod is connected by a pivot 41 in the boss 35 with the free end of one arm 42 of a bellcrank lever 43. This lever 43 is pivoted at 44 between a pair of ears 45 that extend outwardly from the rear side of the boss 35. The vertical arm 46 of said bell crank lever projects downwardly from the pivotal axis 44 for said lever and has a pin and slot connection 47 with one end of a detent pin 48. The bridge piece 23 is of a channel cross section and includes front and rear side flanges 23*a*—23*b* having aligned holes therein through which the detent 48 has sliding bearing. When the bracket is in the horizontal position shown in Fig. 2, the holes in said flanges line up with a bushed opening 49 in the upright flange 19 of the bracket 18, as best appears in Fig. 4. A spring 50 surrounds a part of the detent between the flanges 23*a*—23*b* of the bridge piece 23 and engages at one end against the flange 23*b* and engages at the other end against a collar 51 on the detent. This spring normally urges the detent forwardly and holds the free end of the detent in the bushed opening.

Pivoted at 52 on the hollow handle 38 is an actuator member 53, which includes an arm 54 that overhangs and engages the top end of the rod 40. The bottom end of the member 53 is made to contain a spring 55 that engages the lever 36 and tends to so swing the member 53 as to maintain engagement of the arm 54 with the rod 40. By gripping the handle 38 in the hand, the member 53 is swung about the axis 52 and its arms 54 will exert a downward thrust on the rod and this will, through the bell crank lever 43, withdraw the detent 48 from its locking engagement within the bushed opening 49. Still grasping the handle and swinging it counterclockwise, as in Fig. 2, will cause the frame 21 to tilt into the inclined position shown in Fig. 1. By swinging the lever 36 in the other direction, said frame swings back to horizontal position upon the bracket 18, as appears in Fig. 2. In this swinging movement of the frame 21 and lever 36, the detent 48 swings toward and will engage an angled portion 19*a* (see Fig. 4) of the flange 19 to slide past the same and snap into the bushed opening 49 in said flange to releasably lock said frame in this position.

Means are provided to cushion the tilting movement of the bracket 21 into the inclined position shown in Fig. 1. Preferably each arm 22 of the frame 21 is of a channel cross section so as to include laterally spaced downwardly extending side flanges 22*a*—22*a* as appears in Fig. 5. At one point in each arm is a cross pin 56, upon which is pivotally mounted a bolt 57, which ex-

tends downwardly through the hole in the web 20a of the associated bracket arm 20, which is also of a similar channel cross section. An expansion spring 58 surrounds that part of the bolt between said flange and a nut and washer arrangement 59 on the bottom end of the bolt, as best appears in Fig. 5.

With the arrangement described, when the frame arms 22 swing into the inclined position shown in Fig. 1, the front end of said arms swing upwardly, compressing the springs 58, which function to cushion the swinging action of the frame in this direction. When said frame is swung in the other direction, the springs expand to assist in this movement.

Assume that the seat is disposed transversely of an invalid's bed, toward one side thereof and that the invalid to be transferred from said bed occupies a sitting position on the seat. By reason of the weight disposition of the occupant on the seat, the seat will occupy an inclined position on the bed with its front end directed upwardly.

The transfer device is moved rearwardly toward the side of the bed in line with the seat. By means of the lever 36, the frame 21 is swung into that inclined position corresponding to that of the seat on the bed and the free ends of the rails 24 are then slidingly entered into the grooves 28 in the sides of the seat. The snap 34 on the strap 33 is then engaged with the ring 31 on the seat so that the seat is held against outward or rearward movement on the rails.

The operator then grasps the lever 36 and swings it clockwise (as viewed in Fig. 1) to cause the frame 21, with the invalid occupied seat thereon, to swing back into the horizontal position to be locked in this position by reason of the snapped in engagement of the detent 48 in the bushed opening 49 in the flange 19 of bracket 18. The device as a whole may now be moved upon the wheels 12 and 13 to the point desired.

With the arrangement described, the rails may be more readily positioned to be engaged with the invalid occupied seat resting upon the invalid's bed, than has heretofore been possible in devices of this kind and the occupied seat then releasably locked against escape from said rails.

While in describing the invention I have referred in detail to the form and arrangement of the parts thereof, the same is to be considered only in the illustrative sense so that I do not wish to be limited thereto except as may be specifically set forth in the appended claims.

I claim as my invention:

1. An invalid transfer device embodying therein, upright means, a carriage having vertical guided movement on said upright means, rearwardly extending means on said carriage, means pivotally mounted on said last mentioned means for a tilting movement about a transverse horizontal axis from a substantially horizontal position to an inclined position, a seat member formed for detachable engagement with a part of said pivotally mounted means, and means for releasably locking said pivotally mounted means to said rearwardly extending means against tilting movement to said inclined position when said pivotally mounted means is in its substantially horizontal position.

2. An invalid transfer device embodying therein, upright means, a carriage having vertical guided movement on said upright means, rearwardly extending means on said carriage, means pivotally mounted on said last mentioned means for a tilting movement about a transverse horizontal axis from a substantially horizontal position to an inclined position, a seat member formed for detachable engagement with a part of said pivotally mounted means, means for releasably locking said pivotally mounted means to said rearwardly extending means against tilting movement to said inclined position when said pivotally mounted means is in its substantially horizontal position, and means for cushioning the tilting movement of said pivotally mounted means when it has reached said inclined position.

3. An invalid transfer device embodying therein upright means, a carriage having vertical guided movement on said upright means, rearwardly extending means on said carriage, means pivotally mounted on said last mentioned means for a tilting movement about a transverse horizontal axis from a substantially horizontal position to an inclined position, a seat member formed for detachable engagement with a part of said pivotally mounted means, a lever extending in a direction substantially perpendicular to said pivotally mounted means for tilting the same from one of said positions to the other, and means for releasably locking said pivotally mounted means to said rearwardly extending means against tilting movement when in its substantially horizontal position.

4. An invalid transfer device embodying therein upright means, a carriage having vertical guided movement on said upright means, rearwardly extending means on said carriage, means pivotally mounted on said last mentioned means for a tilting movement about a transverse horizontal axis from a substantially horizontal position to an inclined position, a seat member formed for detachable engagement with a part of said pivotally mounted means, a lever extending in a direction substantially perpendicular to said pivotally mounted means for tilting the same from one of said positions to the other, and means carried at least in part by said lever for releasably locking said pivotally mounted means in said horizontal position upon said rearwardly extending means.

5. An invalid transfer device embodying therein upright means, a carriage having vertical guided movement on said upright means, means at the rear of said carriage and including laterally spaced rearwardly extending portions, means including laterally spaced rearwardly extending arms arranged above said portions of the means at the rear of said carriage, means providing a transverse horizontal pivotal connection between said arms and said portions and whereby said means that includes said arms may be tilted from a substantially horizontal position to an inclined position, rails extending rearwardly of said arms, a seat formed for detachable engagement with said rails, and means for releasably locking said means including said rearwardly extending portions against tilting movement to said inclined position when said last mentioned means is in said horizontal position.

6. An invalid transfer device embodying therein upright means, a carriage having vertical guided movement on said upright means, means at the rear of said carriage and including laterally spaced rearwardly extending portions, means including laterally spaced rearwardly extending arms arranged above said portions of the means at the rear of said carriage, means providing a transverse horizontal pivotal connection between said arms and said portions and whereby said means that includes said arms may be tilted from

a substantially horizontal position to an inclined position, rails extending rearwardly of said arms, a seat formed for detachable engagement with said rails, and means for cushioning the tilting movement of said pivotally mounted means on said means at the rear of said carriage when said pivotally mounted means has been swung into and reaches said inclined position.

7. An invalid transfer device embodying therein upright means, a carriage having vertical guided movement on said upright means, means at the rear of said carriage and including laterally spaced rearwardly extending portions, means including laterally spaced rearwardly extending arms arranged above said portions of the means at the rear of said carriage, means providing a transverse horizontal pivotal connection between said arms and said portions and whereby said means that includes said arms may be tilted from a substantially horizontal position to an inclined position, rails extending rearwardly of said arms, a seat formed for detachable engagement with said rails, and means including resilient members for cushioning and stopping the tilting movement of said pivotally mounted means on said means at the rear of said carriage when said pivotally mounted means has been swung into and reaches said inclined position.

8. An invalid transfer device embodying therein upright means, a carriage having vertical guided movement on said upright means, means at the rear of said carriage and including laterally spaced rearwardly extending portions, means including laterally spaced rearwardly extending arms arranged above said portions of the means at the rear of said carriage, means providing a transverse horizontal pivotal connection between said arms and said portions and whereby said means that includes said arms may be tilted from a substantially horizontal position to an inclined position, rails extending rearwardly of said arms, a seat formed for detachable engagement with said rails, a lever arranged substantially perpendicular to said pivotally mounted means and secured thereto for tilting the same from one position to the other, and means for releasably locking said pivotally mounted means against tilting movement when in its substantially horizontal position.

9. An invalid transfer device embodying therein upright means, a carriage having vertical guided movement on said upright means, means at the rear of said carriage and including laterally spaced rearwardly extending portions, means including laterally spaced rearwardly extending arms arranged above said portions of the means at the rear of said carriage, means providing a transverse horizontal pivotal connection between said arms and said portions and whereby said means that includes said arms may be tilted from a substantially horizontal position to an inclined position, rails extending rearwardly of said arms, a seat formed for detachable engagement with said rails, a lever arranged substantially perpendicular to said pivotally mounted means and secured thereto for tilting the same from one position to the other, and means carried at least in part by said lever for releasably locking said pivotally mounted means in said horizontal position upon said rearwardly extending means.

10. An invalid transfer device embodying therein upright means, a carriage having vertical guided movement on said upright means, means at the rear of said carriage and including laterally spaced rearwardly extending portions, means including laterally spaced rearwardly extending arms arranged above said portions of the means at the rear of said carriage, means providing a transverse horizontal pivotal connection between said arms and said portions and whereby said means that includes said arms may be tilted from a substantially horizontal position to an inclined position, rails extending rearwardly of said arms, a seat formed for detachable engagement with said rails, a lever arranged substantially perpendicular to said pivotally mounted means and secured thereto for tilting the same from one position to the other, a latch at the bottom end of said lever for releasable engagement with a part of said means at the rear of said carriage, and means carried by said lever for actuating the latch to release it from said part of said means when it is desired to tilt said pivotally mounted member into said inclined position.

11. An invalid transfer device embodying therein upright means, a carriage having vertical guided movement on said upright means, means at the rear of said carriage and including a transverse portion and laterally spaced portions extending rearwardly from said cross portion, means arranged above said last mentioned means and including a transverse portion overhanging the first mentioned transverse portion and laterally spaced, rearwardly extending arms, means providing a transverse pivotal connection between the mid portions of said arms and said laterally spaced rearwardly extending portions whereby said arms may be tilted from a substantially horizontal position to an inclined position, a lever extending upwardly from the transverse portion of said means arranged above said means at the rear of the carriage for tilting the same from said horizontal to said inclined position, and means carried by said lever and operable to engage a portion of said transverse portion of the means at the rear of the carriage to releasably lock said means arranged above the same thereto, and rails extending rearwardly from said arms and adapted to have a seat removably applied thereto.

12. In an invalid transfer device, upright means, a carriage having a vertical guided movement on said upright means; rearwardly extending means on said carriage, means pivotally mounted on said last mentioned means for a tilting movement about a transverse horizontal axis from a substantially horizontal position to an inclined position, a seat member formed for detachable sliding guided engagement upon a rearwardly extending means on said pivotally mounted means, means for releasably locking said pivotally mounted means to said means at the rear of the carriage against tilting movement into said inclined position, and means preventing the rearward sliding of said seat on said rearwardly extending means when it is in said inclined position.

13. An invalid transfer device embodying therein upright means, a carriage having vertical guided movement on said upright means, means at the rear of said carriage and including laterally spaced rearwardly extending portions, means including laterally spaced rearwardly extending arms arranged above said portions of the means at the rear of said carriage, means providing a transverse horizontal pivotal connection between said arms and said portions and whereby said means that includes said arms may be tilted from a substantially horizontal position to an inclined position, rails extending rearwardly of said arms, a seat formed for detachable engagement with

said rails, means for releasably locking said means including said rearwardly extending portions against tilting movement to said inclined position when said last mentioned means is in said horizontal position, arm rests arranged above and carried by said arms, and means for detachably connecting the seat to one of said arm rests when said pivotally mounted means is in said inclined position for preventing said seats from being slidingly displaced from said rails.

MELVIN M. FARMER.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,101,598	Weinke	June 30, 1914
2,375,907	Farmer	May 15, 1945
2,375,908	Farmer	May 15, 1945