May 14, 1957 H. A. I. JOHANNESEN 2,792,052

INVALID WALKER AND TRANSFER DEVICE

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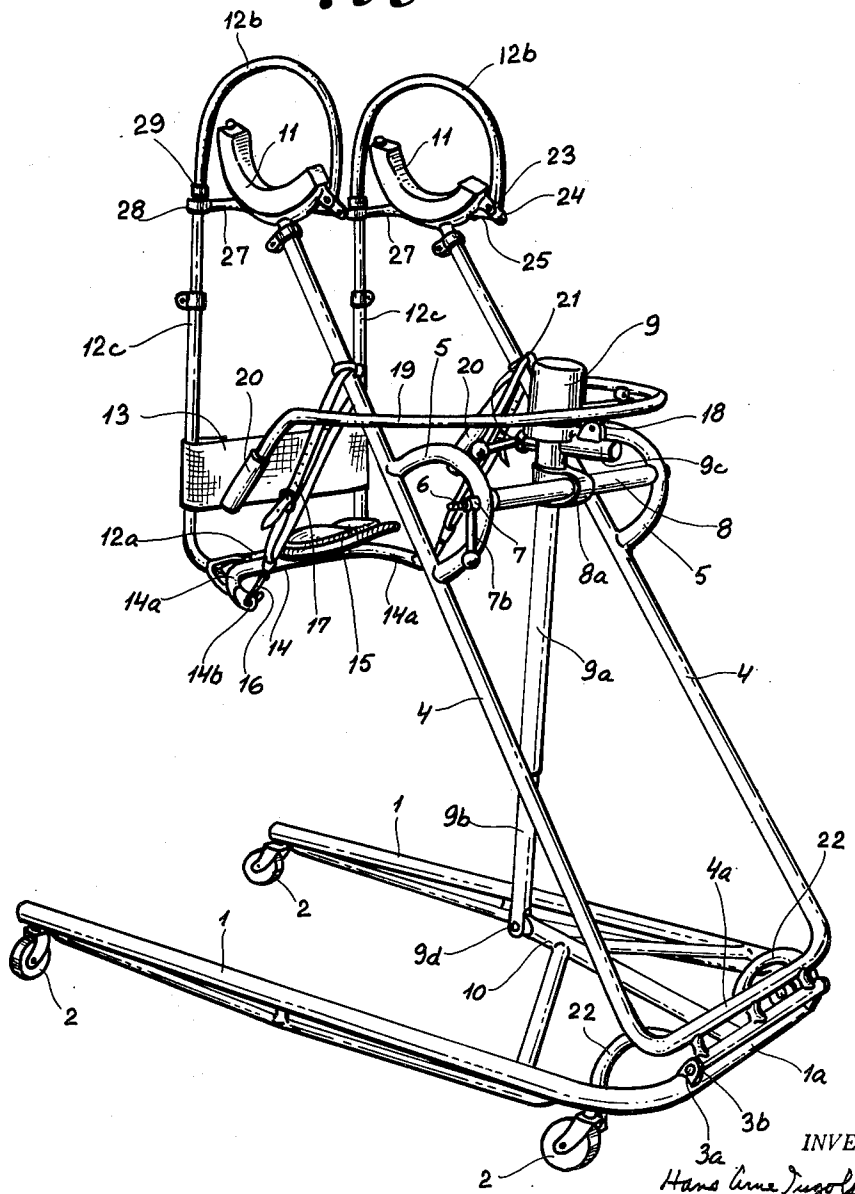
Fig. 1



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INVALID WALKER AND TRANSFER DEVICE

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Fig. 2

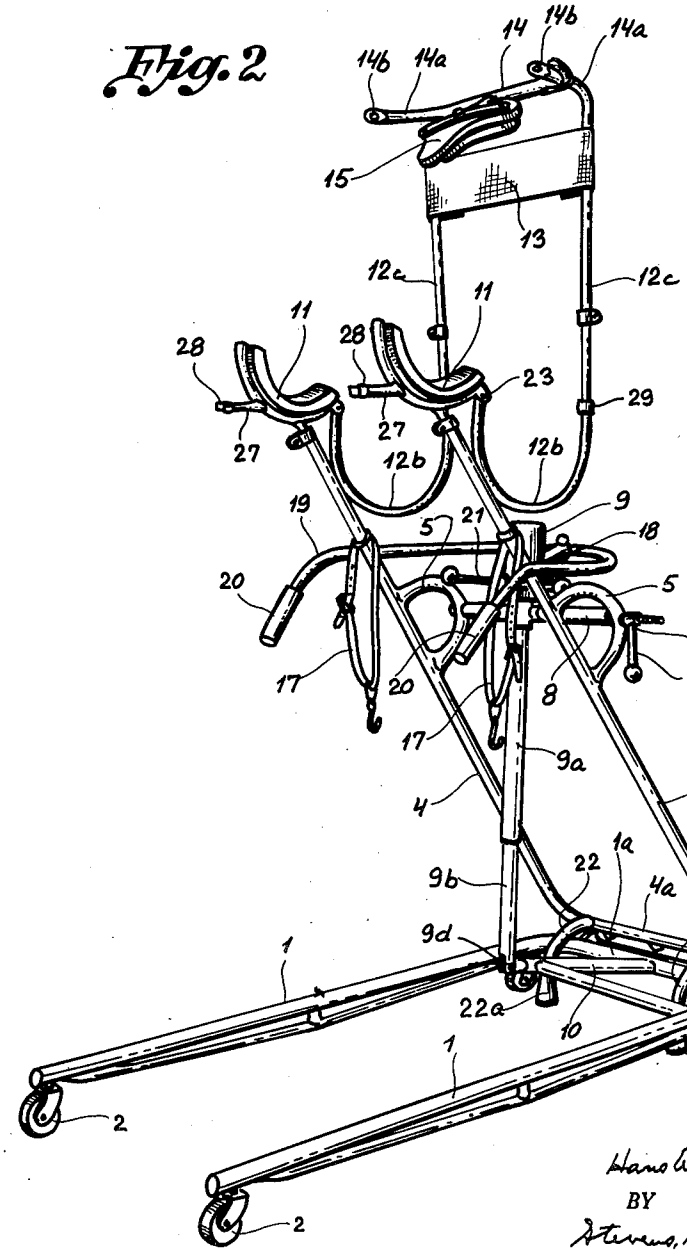

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Fig. 5

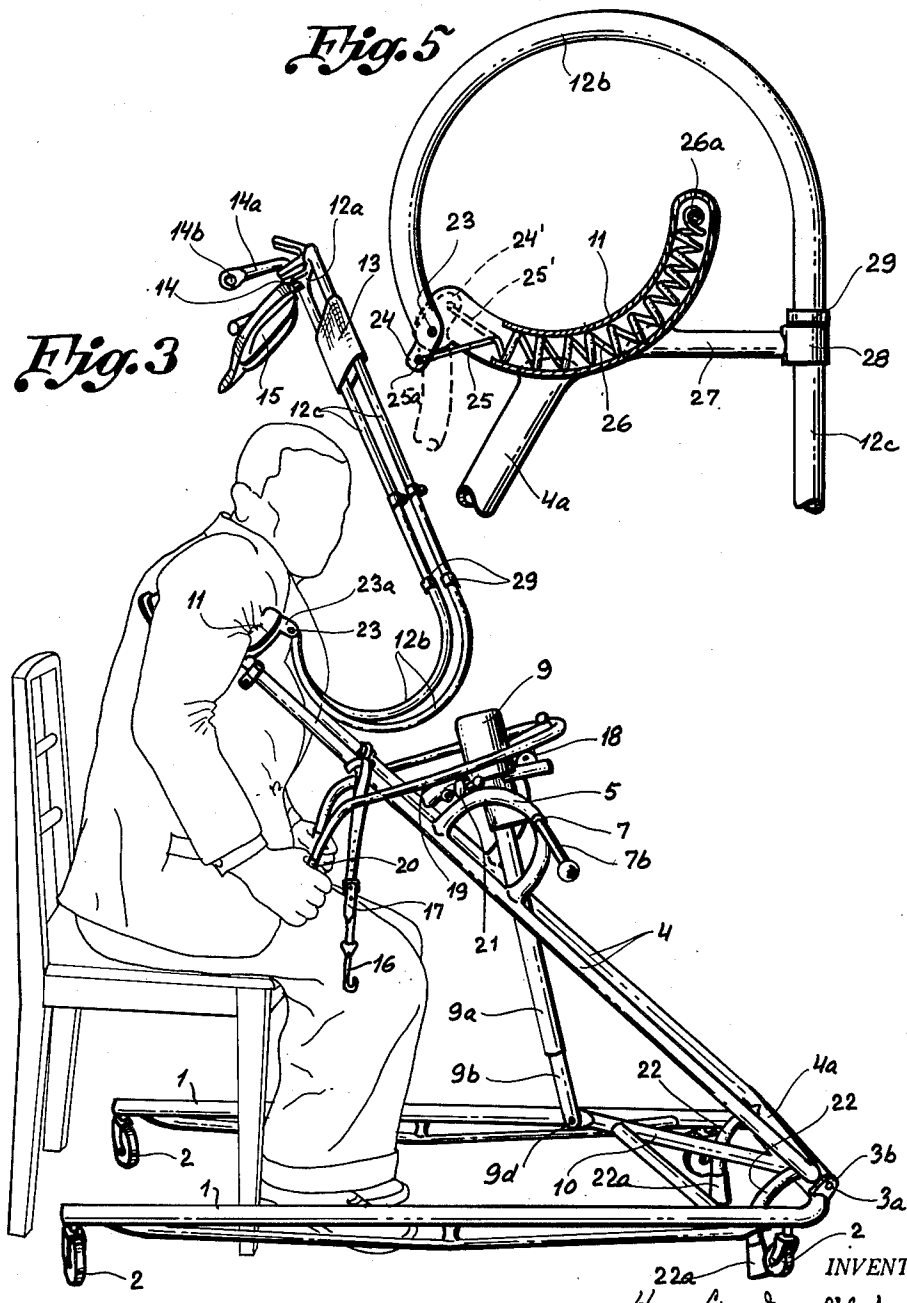

Fig. 3

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Fig. 4

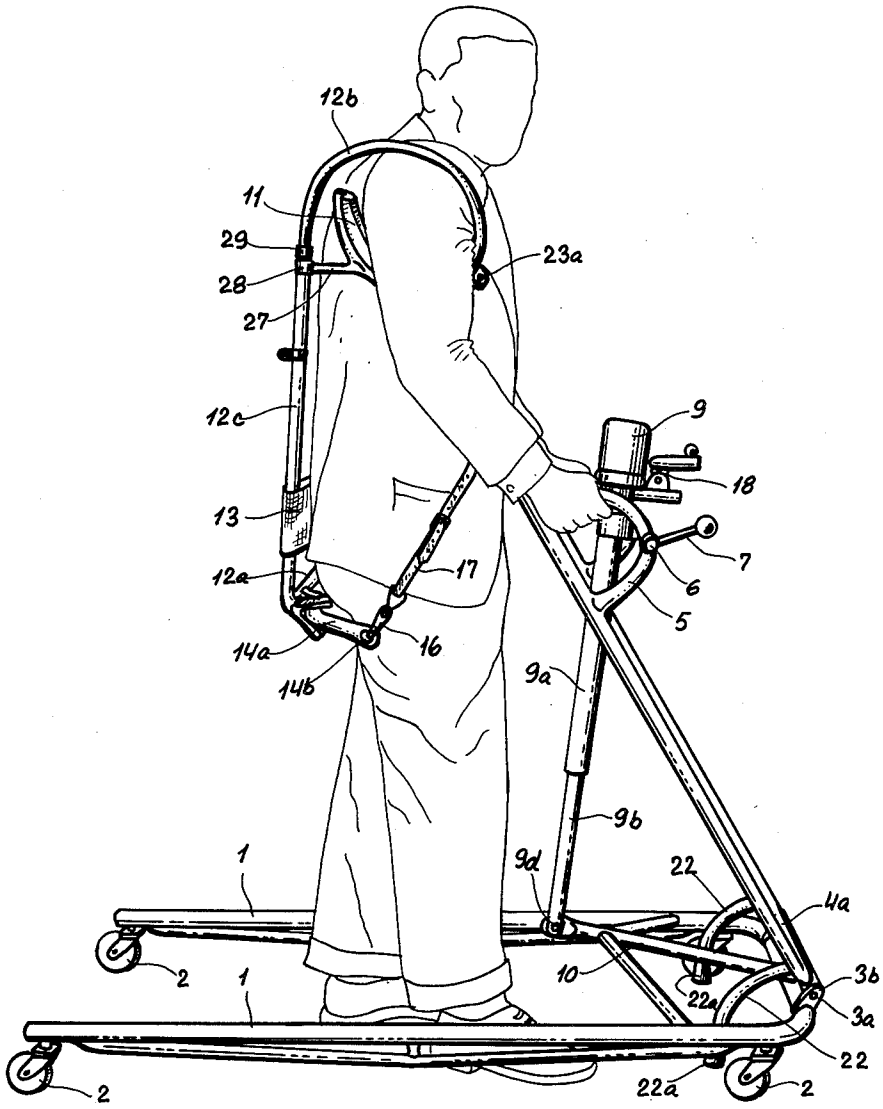

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Fig. 6

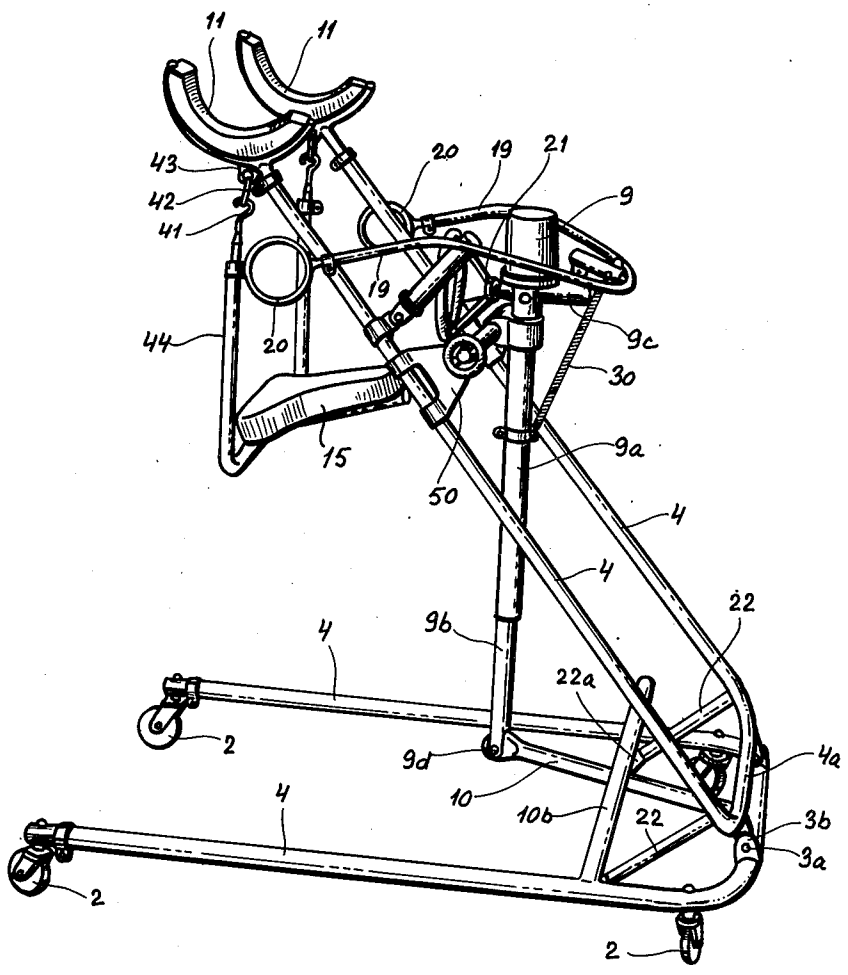

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Fig. 7

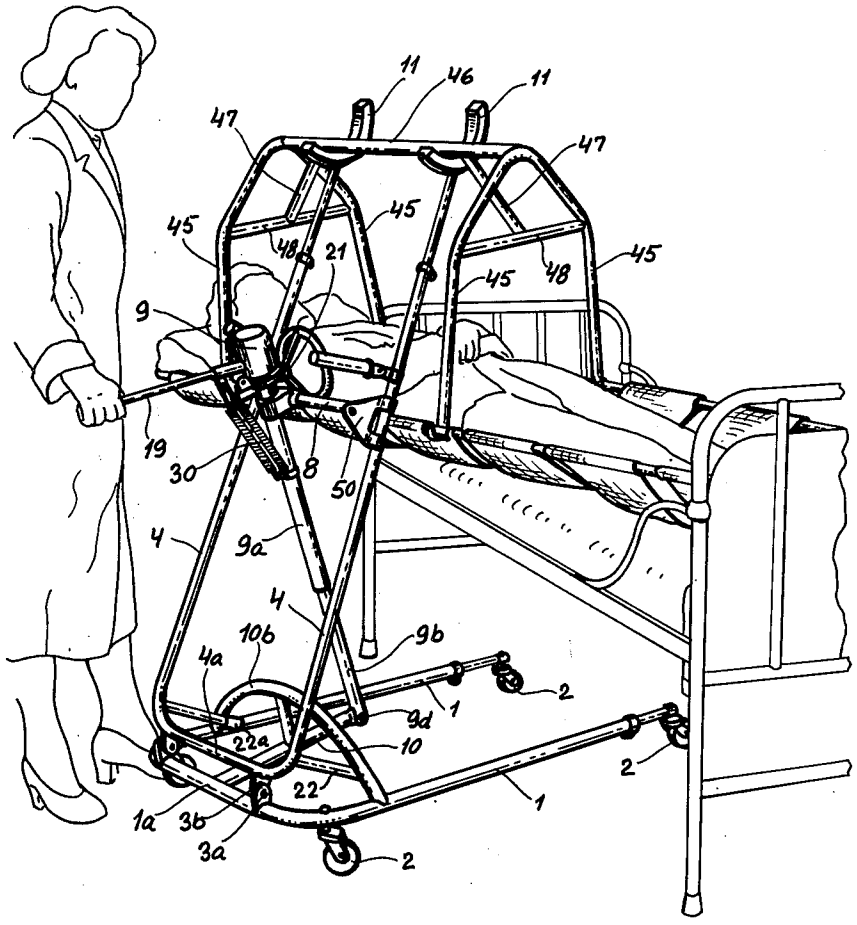

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Fig. 8

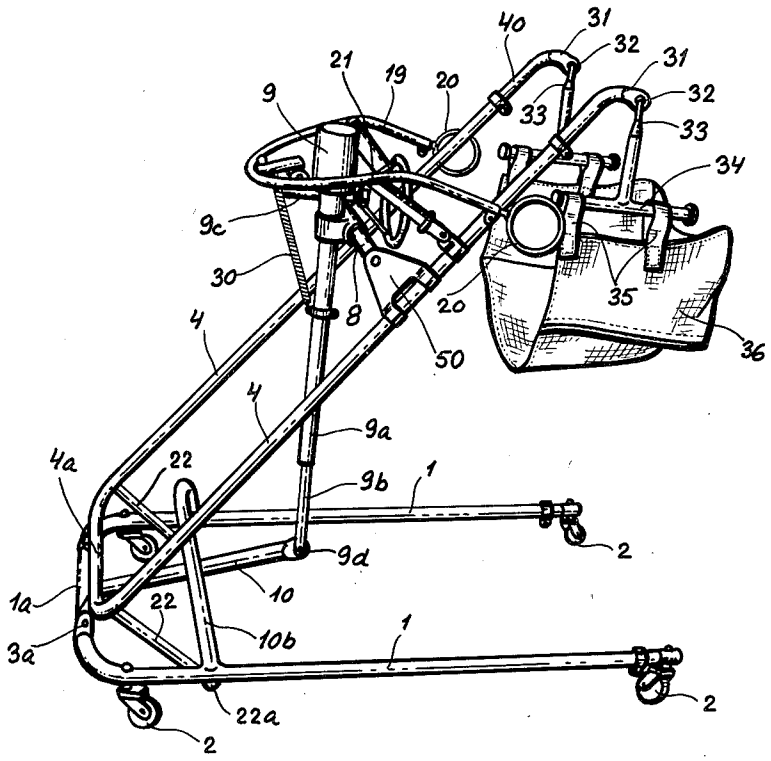

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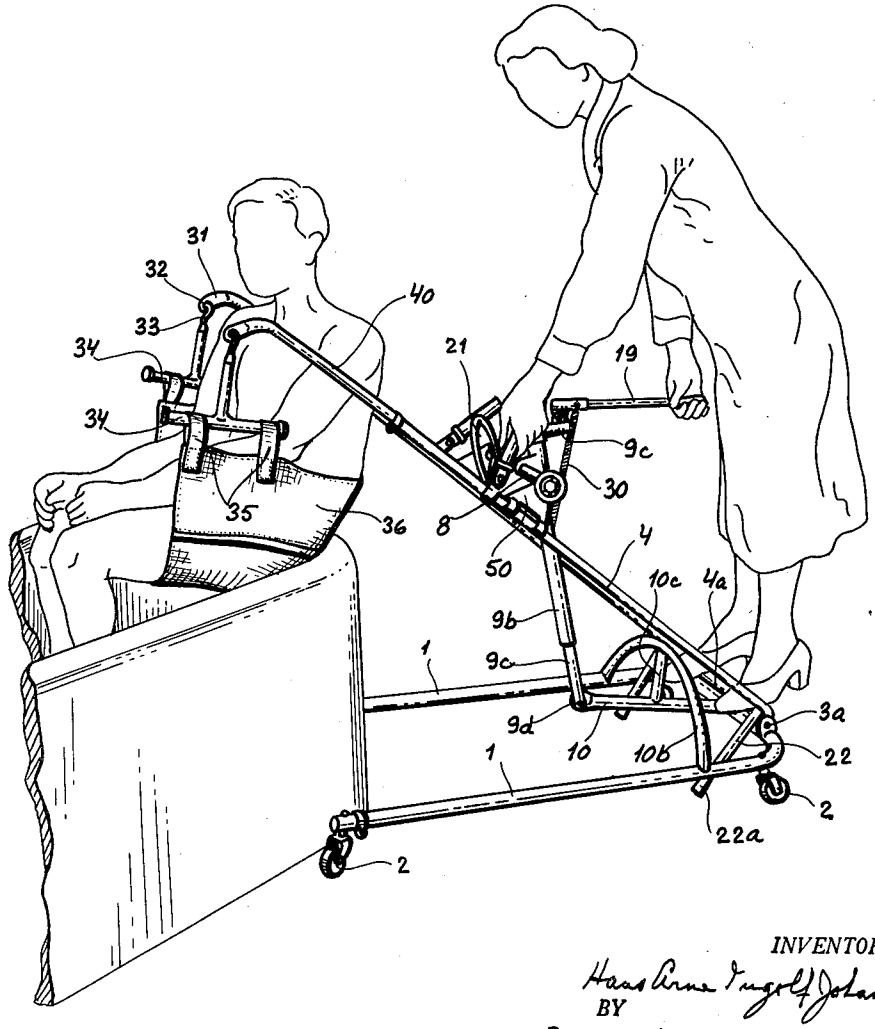
Fig. 9



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United States Patent Office 2,792,052 Patented May 14, 1957

2,792,052

INVALID WALKER AND TRANSFER DEVICE

Hans Arne Ingolf Johannesen, Klampenborg, near Copenhagen, Denmark

Application August 5, 1953, Serial No. 372,550

Claims priority, application Denmark May 15, 1953

8 Claims. (Cl. 155—24)

This is an invention for a device which, because the functions that it performs, is designated as an "invalid walker and transfer device" and the main objects of the invention are:

First, to provide a device which, in addition to serving as a walking device or perambulator enabling persons who have lost the physical properties for walking to move about and to exercise the use of their legs, provides means for enabling such persons to rise from a seated to a standing position.

Second, to provide a device of this character which is operable by the user from either a sitting or a standing position.

Third, to provide an invalid walker with a seat supporting structure which may be readily and quickly shifted to a position to enable an invalid to enter the device from behind without obstruction and then be replaced in operative position to provide a comfortable seat and back rest.

Fourth, to provide a device which, in addition to serving as a walker, is also applicable as a transfer device for safely transferring bed patients from place to place.

Fifth, to provide a device of this class which is of simple and inexpensive construction comprising a minimum of components.

With the above recited and other objects and advantages in view, the invention is set forth in greater detail in the following specification and illustrated in the accompanying drawings, in which:

Fig. 1 is a perspective view from the forward end of an invalid walker showing the seat supporting structure in depending position.

Fig. 2 is a perspective view from the rear end of the invalid walker illustrated in Fig. 1 and showing the seat supporting structure in elevated position.

Fig. 3 is a perspective side view illustrating the device with the supporting frame in its lower position for supporting a seated person and with the seat supporting structure in its elevated position.

Fig. 4 is a similar perspective side view showing the supporting frame in depending position for supporting a standing person and with the seat member swung back to the operative position at the back of the user.

Fig. 5 is an enlarged detail elevational view showing details of the crutch and seat supporting members.

Fig. 6 is a perspective view of a modified embodiment of the structure showing the seat suspended beneath the crutch members.

Fig. 7 is a perspective view from the front end of the structure with attachment for supporting a person in a horizontal position.

Fig. 8 is a perspective side view of the structure with cantilever attachment for suspending a flexible seat.

Fig. 9 is a similar perspective view of the structure in operative position for raising or lowering a seated person from or into a bath tub.

Referring to the drawings by characters of reference,

the invalid walker and transfer device consists of a U-shaped base frame comprising a front member 1*a* and a pair of rearwardly extending side members or legs 1 supported on castor wheel 2 at the forward and rear ends thereof, and of a similar U-shaped frame, hereinafter referred to as the supporting frame, comprising a front member 4*a* and a pair of rearwardly and upwardly extending arms 4. The front member 4*a* is hingedly connected with the front member 1*a* of the base frame by means of pivots 3*a* journalled in brackets 3*b* on the front member 1*a*.

Secured to the arms 4 of the supporting frame are bracket members 5. A rod or bolt 6 threaded at one end is secured to one of the said brackets 5 and extends transversely through holes in both brackets and is provided with a nut 7*a* at the free threaded end thereof. Secured to the nut 7*a* is a lever 7*b* for tightening the nut 7*a* against the adjoining bracket 5 so as to form a spanning device to adjust the distance between the arms 4 within certain limits determined by the yielding capacity of the supporting frame 4, 4, 4*a* and by the length of a tubular member 8 journalled on the rod 6. Extending from the middle of the tubular member 8 is a bracket 8*a* secured to the upper portion of a power cylinder 9*a* forming part of a hydraulic hoist of the automobile jack type comprising an oil reservoir 9, a pump 9*c* and a piston rod 9*b* the lower end of which is pivotally connected at 9*d* with an arm 10 rigidly secured to the base frame and extending rearwardly from the front member 1*a* thereof between the legs 1. The arm 10 is further supported relatively to the base frame by lateral bracing members 10*a* as shown in Figs. 1 to 4 or by an arcuate bracing member 10*b* and an intermediary tie bar 10*c* as shown in Figs. 6 to 9.

As it will appear from the drawings the arrangement of parts 10, 9*d* and 5, 6, 8, 8*a*, 9*a* provides for pivotal connections of the lower and upper ends of the hydraulic lifting device with the base frame and the supporting frame respectively.

Secured to the housing 9*c* of the pumping device pertaining to the hydraulic hoist device are a pair of brackets 18, Fig. 1, supporting a pivot for pivotally connecting the pumping device with a substantially U-shaped operating lever 19 carrying handgrips 20 at the free ends thereof.

It is desirable to provide means whereby the device may be held from rolling on the floor when the supporting frame is in its lower position as shown in Fig. 3. To this end, the front member 4*a* of the supporting frame is provided with a pair of downwardly projecting feet 22 rigidly secured to the frame member 4*a* and provided with rubber knobs 22*a* at the free ends, the length of the feet 22 being such that, when the supporting frame is in its lowermost position as shown in Fig. 3, the rubber knobs 22*a* will be pressed against the floor thereby raising the front end of the base frame 1 sufficiently to lift the forward castors 2 from the floor.

The frameworks constituting the base frame and the supporting frame are made of hollow cylindrical tubing bent at substantially right angles at the ends of the front members 1*a* and 4*a* so as to provide substantially U-shaped frames. The free ends of the legs 1 of the base frame are closed to prevent dust and impurities to penetrate into the cavity of the base frame, whereas the free ends of the arms 4 are left open to receive extensions telescopically and adjustably mounted therein. In the embodiment illustrated in Figs. 1 to 7 these extensions are crutch staffs 40 carrying armpit rests 11. Mounted swingably about an axis defined by pivots 23 secured to brackets 23*a* on the armpit rest 11 is a seat supporting structure comprising a pair of substantially

J-shaped rods 12*b* telescopically and adjustably mounted within tubular members 12*c* forming branches of a substantially U-shaped framework 12*a*, 12*c*, 12*a*. Pivotally mounted on the cross member 12*a* of this framework is a seat support 14 carrying a saddle seat 15 and having forwardly bent ends to provide arms 14*a* having holes 14*b* to receive hooks 16 mounted on adjustable straps 17 secured to the upper ends of the tubular arms 4 so as to provide an adjustable suspension of the seat support 14. A back rest comprising a flexible material 13 is suspended across the space between the tubular members 12*c* forming part of the seat supporting frame structure, sufficiently close to the seat support 14 to leave the major part of the space between said tubular members unobstructed so as to permit the seat supporting frame structure to be swung above the head of the user from the elevated position shown in Fig. 2 to the depending position of Fig. 4.

Secured to the back portions of the armpit rests 11 and projecting rearwardly therefrom are supporting members 27 bifurcated at the free ends 28 thereof to receive the portions of the supporting rod 12*b* immediately below the stops 29 secured thereto, when the seat supporting frame structure is swung into the depending position shown in Fig. 1.

By this arrangement the stress exerted on the seat supporting frame structure due to the load on the seat 15 is transferred through the tubular members 12*a* and the adjacent portions of the rods 12*b*, stops 29 and supports 27, 28 to the crutch elements 11, 40 and is finally absorbed by the supporting frame 4, 4*a*, 4. This relieves the bent portions of the J-shaped rods 12*b* of the weight of the person seated on the seat 15 and thus enables the dimensions of these rods to be substantially reduced.

The swinging motion of the seat supporting frame structure may be facilitated by means of the arrangement illustrated in Fig. 5. In this embodiment the armpit rests of the crutch elements are hollow and a tensioned helical spring 26 is mounted within the cavity of each armpit rest. One end of this spring is attached to a pin 26*a* secured in the hollow casing forming the armpit rest 11, and the other end 25 of this spring is pivotally mounted on a pin 25*a* carried by an arm 24 projecting from the free end of the rod 12*b* adjacent the turning axis 23 thereof. Slits are provided in the hollow casing to permit movement of the end 25 of spring 26 and of the arm 24 relatively to the casing. In the depending position of the seat supporting frame structure shown in Fig. 5 the arm 24 is in the position shown in full lines in the drawing. When the frame structure is swung to the elevated position through an angle of about 180° the arm will assume the position 24′ shown in broken lines within the cavity of the crutch member 11. In both of these extreme positions the spring 26 is extended and will exert a torque on the frame structure through the arm 24 tending to assist the swinging motion of the frame about the axis 23.

Fig. 6 shows a modified construction of the seat supporting member. In this embodiment the seat is mounted on the cross member of a U-shaped frame 44 suspended below the crutch members 11 by means of hook 41 engaging eyelets 42 pivotably mounted at 43 on the crutch members 11.

Fig. 7 illustrates the use of the supporting and transfer device for suspending an attachment comprising a cage-like frame structure adapted to grip a stretcher for carrying a person in horizontal position. The details of this cage structure comprising a pair of spaced apart frames 45 of substantially inverted V-shaped formation with intermediate bracing members 46, 47, 48 will clearly appear from the drawing and require no further explanation.

In the embodiment illustrated in Figs. 8 and 9 the extensions of the tubular arms 4 of the supporting frame comprise a pair of cantilever attachments 31 telescopically and adjustably mounted therein and provided with holes 32 for engagement with hook members 33 on supporting bars 34 for supporting a flexible seat 36 by means of straps 35.

With the device described and illustrated, a person seated in a chair as shown in Fig. 3 and preparing to rise to standing position first reaches over and places the crutch heads 11 in his armpits; then grips the handles 20 of the control lever 19 and operates this lever by small rapid reciprocating movements thereby operating the pump mechanism of the hydraulic hoist device 9*a*, 9*b* which tends to force the piston 9*b* downwardly. Since, however, this movement is arrested by the arm 10 rigidly secured to the base frame, the cylinder 9*a* will be forced upwardly and will raise the supporting frame to an angular position relatively to the base frame determined by the movement of the cylinder 9*a* relatively to the piston 9*b*. During this movement, the person is gradually raised from the seated position to the standing position shown in Fig. 4 or to any intermediate position which he may select to suit his convenience. In the upright position shown in Fig. 4 the weight of the user is carried by the supporting frame and crutch members, and it is now only necessary for the user to put slight pressure on the feet to produce sufficient traction to propel the device on reasonably smooth surface. As shown in Fig. 4 the seat structure is swung from the elevated position of Fig. 3 through an angle of about 180° over the head of the user thereby bringing the saddle 15 and the back rest 13 in their operative positions, with the supporting members 27, 28 resting against the crutch heads 11 and the hooks 16 of straps 17 engaging the arms 14*a* of the saddle support.

Since the hydraulic hoist device 9*a*, 9*b* is of the standard reversible jack type used for automobiles in which the relative movement of the cylinder and piston is automatically checked when the control lever is inoperative, it will be understood without further explanation that the device may be used for operation in the reverse direction, i. e. for lowering a person from standing to seated position by operating the normal release means used in such devices of well-known construction.

In Figs. 1 to 6 the device is illustrated in its function as a walker enabling persons who have been crippled or otherwise disabled to rise from a seat and to move about in perfect safety without requiring the help of attendants. However, when provided with the attachments shown in Figs. 7 to 9, it may further be used as a crane-like lifting and transfer device for safely transferring bed patients from place to place as from a bed to a bath tub or for lifting patients out of bed for placement of pans or change of linen. When used for such purposes, the device must be operated by an attendant, but it will be appreciated that such operation requires neither skill nor physical strength on the part of the attendant, and the device therefore presents considerable advantages as a labor saving auxiliary equipment for hospitals, invalid homes etc.

While I have illustrated certain details of construction and certain definite arrangements of parts which, in actual practice, have been found to be particularly useful, it is to be understood that the invention is not limited to these details except as defined in the appended claims.

What is claimed is:

1. A device of the character described comprising a U-shaped base frame and a tubular U-shaped supporting frame hingedly connected therewith and including a pair of parallel rearwardly extending tubular arms, crutch attachments telescopically adjustable within said tubular arms, a seat supporting member pivotally connected with said crutch attachment and comprising a pair of sub-

stantially J-shaped supporting rods, the space between said supporting rods being left unobstructed to allow the supporting member to be swung about the crutch attachments above the head of a user positioned therebetween, a seat mounted at the end of said supporting member, a back rest mounted on said supporting member and extending between the supporting rods and operable means pivotally connected with said base frame and supporting frame to provide for swinging movement and angular adjustment of the position of the supporting frame relatively to the base frame.

2. A device as defined in claim 1 in which the crutch attachments comprise a pair of hollow arm rests each comprising a spring located within the cavity of the arm rest, pivots connecting the arm rests with the arcuate ends of the supporting rods, an arm extending from the end of each supporting rod and connected to one end of each spring within said arm rests.

3. A device as defined in claim 1 comprising a pair of downwardly projecting feet mounted on the web portion of the supporting frame to provide for blocking the base frame against its support when the supporting frame is swung downwardly towards the base frame.

4. An invalid supporting apparatus comprising a U-shaped mobile base frame having a front web portion and a pair of rearwardly extending parallel legs, and a U-shaped supporting frame comprising a front web portion and a pair of parallel upwardly extending crutchlike elements adjustably mounted thereon, hinge means connecting the front web portions of the two U-shaped frames to provide for adjustable angular vertical movement of said frames relatively to one another, a seat member pivotally attached to the said crutchlike elements of the supporting frame, a hydraulic lifting device comprising a power cylinder pivotally connected with one of the said U-shaped frames, and a plunger pivotally connected with the other U-shaped frame, an operating lever for the hydraulic lifting device extending rearwardly from the supporting frame and adapted to be operated by a person supported by the crutchlike elements and by the seat attached thereto, so as to provide for adjustment of the angular position of the supporting frame relatively to the base frame.

5. An invalid supporting apparatus as claimed in claim 4, wherein said web portion of the supporting frame has downwardly disposed feet adapted to rest on the ground when the supporting frame is moved to its lowest position overlying the base frame, said feet blocking the base frame.

6. An invalid supporting apparatus as claimed in claim 4, wherein axially adjustable brace means transversely connects the crutchlike elements of the supporting frame to adjust the lateral distance between the crutchlike elements.

7. An invalid supporting apparatus as claimed in claim 6, wherein said brace means pivotally supports one end of the hydraulic lifting device.

8. An invalid supporting apparatus as claimed in claim 7, wherein an arm extends rearwardly from the web portion of the base frame and is disposed between and parallel with the legs of such frame and pivotally supports the other end of the hydraulic lifting device and braces extending laterally from the legs and attached to the arm.

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