United States Patent

Koller

[15] **3,694,830**

[45] **Oct. 3, 1972**

[54] **HOSPITAL BED**

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[22] Filed: **June 17, 1970**

[21] Appl. No.: **47,104**

[30] **Foreign Application Priority Data**

June 18, 1969 Germany.....P 19 30 789.2

[52] **U.S. Cl.**.....**5/63**, 5/81

[51] **Int. Cl.**.....**A61g 7/00**, A61g 7/10

[58] **Field of Search**.....5/2, 60–63, 81, 5/92, 317, 330, 332

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[57] **ABSTRACT**

Hospital bed arranged for independent vertical or tilting adjustment. The bed frame is supported for tilting adjustment on a subframe which latter is movable for vertical adjustment bodily on a base frame. The base frame may be supported on a wall, on the floor or otherwise. A variety of auxiliary devices are supported on the subframe or on the base frame.

10 Claims, 2 Drawing Figures

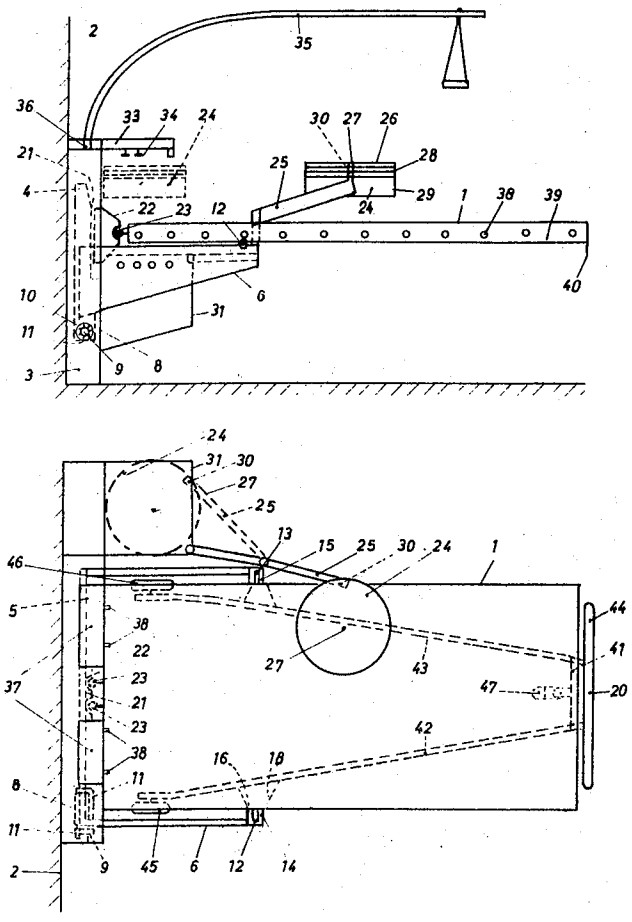


Fig. 1

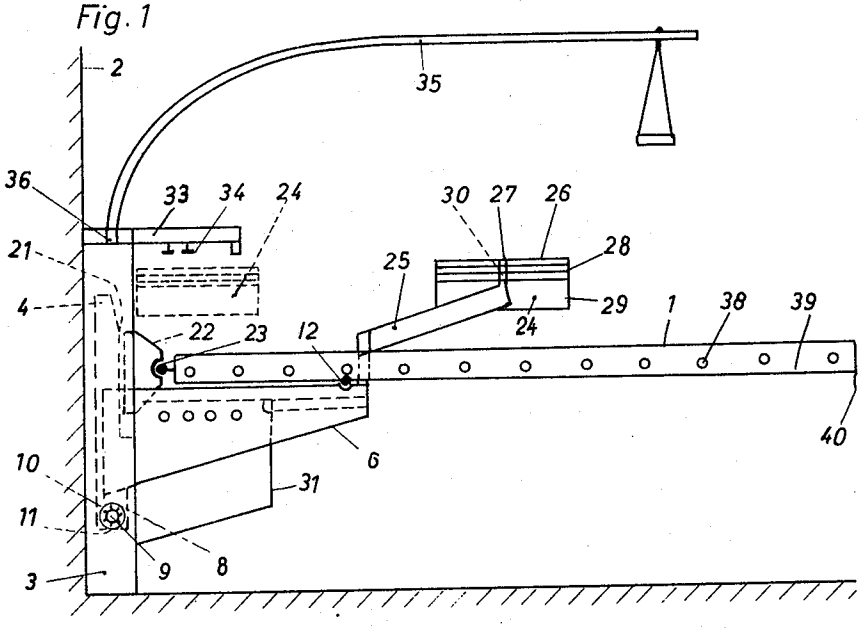
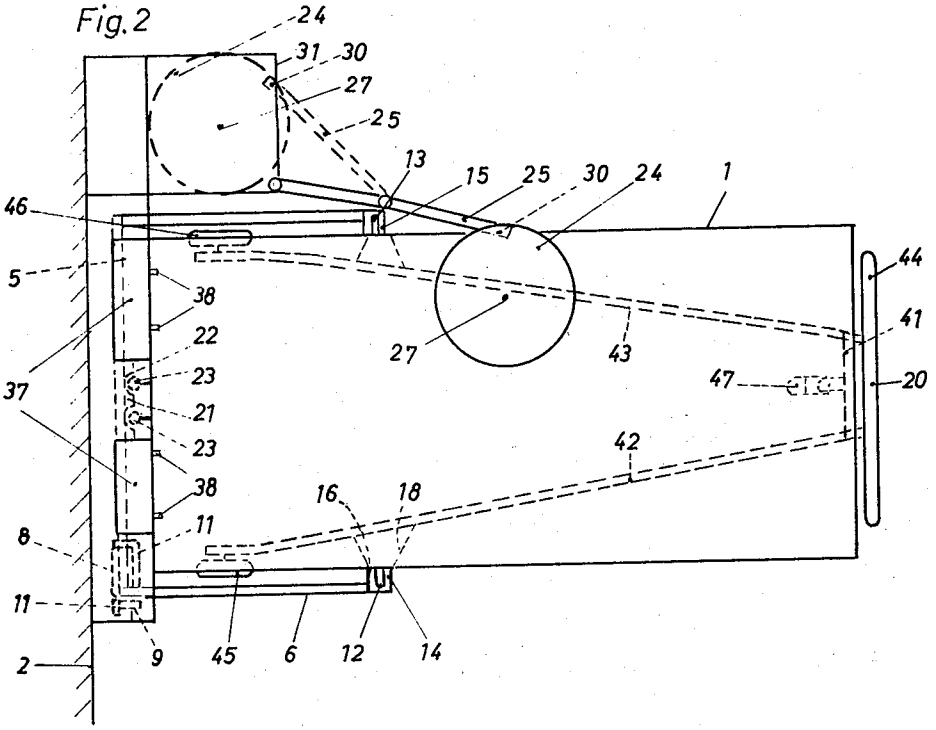


Fig. 2



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HOSPITAL BED

The basic purpose of the invention is to produce a hospital bed which permits a versatile use, adjustment and equipment and easy manipulation, is easily transportable, can be stacked in very little space and can be sterilized.

To attain this purpose the invention provides that a removable bed frame is supported spaced from the floor and adjustable in height. Same is accomplished by a carrier assembly having a stationary vertical base frame for a subframe which is adjustable in height and variable in position and has freely projecting support arms on which the bed frame can be supported.

According to the invention, by spacing the bed frame from the floor, the hygiene of hospital rooms is improved and the cleaning thereof is simplified. Further, when such hospital beds are equipped and used as accident beds, the required provisions are made to the base frame, subframe or bed frame, either for the comfort of the patient or to fixedly secure whatever auxiliary means are required for the effective care of the patient. It is not important whether the vertical base frame is mounted on the wall in the hospital room, is inserted in a recess of the wall or stands freely. For example, in a large hospital room the vertical frame can stand in a mirror-image double construction.

According to a further development of the invention, provision is made for the bed frame to tilt about a transverse axis on cross pins arranged in recesses in the support arms and its inclination is adjustable through a third support which can be changed in position opposite the subframe and can be adjusted in height with respect to the subframe. The third support consists advantageously of a receiving means for a longitudinal pin fixed to the bed frame, which receiving means is movable and lockable in a guide of the subframe.

Through the support of the bed frame at a minimum of three points, whereby the end of the bed frame facing the wall can be supported directly or indirectly, the bed is accessible from five sides so that various chambers, oxygen tents, etc., can be moved easily over the hospital bed from the free front end thereof. Thus, it becomes possible by providing the third support at a point remote from transport devices, in particular a cart, to effect a taking over of the bed frame without requiring that the subframe be adjusted or that a lifting mechanism be provided on the transport device. Rather it is sufficient to place a cart, which is designed to correspond to the normal height of the bed, under the horizontally standing bed frame or under the bed frame which is lifted up at its free front end by the inclination device, then to lower the bed frame by operating the inclination adjustment at its free front end sufficiently that it cooperates with a U-shaped receiving means on the cart with a suitably shaped front portion and can be lifted in this supported position by lifting the support on the wall from the recesses of the subframe and can be lowered into correspondingly constructed receiving means on the cart.

According to a preferred embodiment of the invention, a turntable is supported on a support arm of the subframe through an articulated bracket. The turntable has advantageously a table plate, a storage plate and a pan which are swingable with respect to one another. It is also advantageous to construct the table plate substantially circular and to support it rotatably in the center.

Thus, the patient can selectively remove something from the pan provided underneath the storage plate through the easily operatable articulated bracket. Alternatively, he can swing the storage plate toward himself or he can use the table plate. Since the table plate can be rotated about its center point, the table surface can easily be used in its entirety since articles which are at the moment not needed can be removed from the direct zone of action of the user by rotating the table without special effort.

Important further convenience for the patient is achieved according to the invention in such a manner that the entire electrical installation, like for example for the bell, light, phone, radio and television and the like is arranged fixed to the frame.

A small bed-side nightstand is advantageously supported on the framework of the hospital bed, which nightstand can be constructed as an emergency seat. The turntable when same is moved back to the wall and the nightstand form thereby components correlated to one another to form a unit having the necessary floor clearance for required cleaning operations. Said unit also advantageously has a consule in the upper part positioned above the retracted turntable and fixed to the subframe, which console has connections for a bed bracket, an irrigator and for orthopedic auxiliary means or the like.

The many possibilities for use of the hospital bed of the invention are further increased by providing in the bed frame such holes or rails as may be needed for setting up accessories like bed bracket, irrigator, screens, straps, extension auxiliary means, orthopedic auxiliary means and the like. Such a construction is important particularly for a use as accident bed and makes the treatment of the patient much easier.

A further construction of the invention provides on the vertical base frame above the bed frame a console for an oxygen connection or the like, which console is fixed to the frame.

To assist in transportation, the bed frame is provided according to the invention with means on its free front end to cooperate with a U-shaped receiving device on a cart by gripping thereunder or interlocking with same, which makes it possible to interlock the bed frame and cart without the need for relatively movable parts.

Furthermore, it is possible through the arrangement and construction of the bed frame of the invention to use a simple cart which consists substantially only of trapezoidally connected frame members; at least three wheels and a handle on the narrower front end. At least one of these wheels is constructed as a caster wheel so that the suitable steerability is obtained through the handle.

The bed frames are advantageously supported above their cross pins in open recesses of the cart, said recesses corresponding to the recesses on the subframe.

All further disclosures with respect to the invention can be obtained from the following description in connection with the claims and the drawing in which a preferred illustrative embodiment of the invention is schematically illustrated.

In the drawing:

FIG. 1 is a side-elevational view of the hospital bed of the invention; and

FIG. 2 is top view of the hospital bed substantially according to FIG. 1 with a cart pushed under the bed.

The bed frame 1 is supported spaced from the floor and adjustable in height by a carrier assembly which consists substantially of a vertical base frame 3 placed onto the wall 2 and a carriage or subframe 5 adjustable in height in a guide 4 arranged in said vertical frame. An electric motor 8 with a pinion 9 is indicated in FIG. 1 as the drive for the subframe which is formed of two freely projecting support arms 6 and 7 and at least one connection, said pinion engaging a rack 10. In the drawing, the motor 8 is arranged on a bracket 11 which is fixedly secured to the subframe and the rack 10 is fixed to the base frame and is vertically positioned.

Cross pins 12 and 13 are provided on the longitudinal sides of the bed on the bed frame 1, which cross pins are supported in open recesses 14 and 15 on the support arms 6 and 7 or recesses 16 and 17 on the cantilevers 18 and 19 on a cart 20. The bed frame 1 can be inclined around the transverse axis defined by the cross pins 12 and 13. An additional support of the bed frame is provided on the wall by a receiving means 22 which can be vertically moved and locked in a guide 21 and at least one longitudinal pin 23 fixed to the bed frame. By moving the receiving means 22, which can be done for example by manual operation (not illustrated in the drawing) through a cable line or through a pneumatic device which works against the effect of a spring, almost steplessly selectable "head high" or "foot high" bed positions can be obtained corresponding to the spaces of a toothed locking device which is also not illustrated in the drawing.

The elevational adjustment of the bed frame is completely separate from the inclination adjusting device. Thus, the bed frame 1 can be lifted or lowered as desired through the motor and at the same time maintain a given inclination. It is also possible, independent of the lifting or lowering process, to change as desired the inclination of the bed frame. The lowermost bed position, namely the smallest distance from the lower edge of the bed frame and the floor, is chosen in such a manner that even weak patients can leave the bed, if necessary, without any help and that the cart 20 can drive underneath the bed frame even when in its lowest position.

A turntable 24 is lifted or lowered together with the subframe, which turntable is arranged on one of the support arms 6 or 7 through an articulated bracket 25. The articulated bracket permits, particularly in the case of a multisection construction, an easy movement of the turntable 24 above or beside the bed. As can be particularly seen from FIG. 2, the turntable 24 has a table plate 26 which is substantially round and is rotatably supported in the center 27. Underneath the table plate 26 there is a storage plate 28 and under that a pan 29, each supported eccentrically in its edge zone pivotable about a vertical axis 30 against one another and in alignment with the table plate 26. Thus, the turntable offers the patient almost an unlimited number of possibilities for its use.

Furthermore, a nightstand 31 is pivotably supported on the subframe, which nightstand forms in swung-out position beside the bed an emergency seat and forms, in the position illustrated in the drawing, a single unit with the turntable 24 when same is swung back against the wall.

The entire electrical installation for bell, light, phone, radio and television and the like is mounted into the nightstand 31 or otherwise fixed to the subframe so that the patient can supply himself from his bed in the most convenient manner with the comforts he desires. The electrical installation is indicated by reference numeral 32 in FIG. 1 of the drawing.

The vertical base frame 3 supports a console 33 positioned above the bed frame 1, which console is equipped with connections for oxygen or the like. The oxygen connection is indicated by reference numeral 34 in FIG. 1 of the drawing. The console 33 is for reasons of clarity not illustrated in FIG. 2. Furthermore, the console 33 is provided with plug connections 36 for a bed bracket 35 or an irrigator or other orthopedic auxiliary means. The same connection possibilities are also provided fixed to the subframe. However, for reasons of a better understanding these connections fixed to the subframe are not illustrated in the drawing. Furthermore, these connections can also be provided directly on the bed frame 1 or in the form of an attachable supply part 37 as this is indicated in FIG. 2 of the drawing. For this purpose, holes 38 and rails 39 are arranged in the bed frame 1, in which holes and rails accessories, like screens, straps for strapping in, extension auxiliary means, orthopedic auxiliary means as well as the bed bracket and the irrigator and the like can be set up. Such a construction is particularly advantageous for the accident clinics.

In order to be able to easily transport the bed frame, a profile 40 is provided on the free front end of the bed and a U-shaped receiving means 41 is provided on the cart, the respective shapes thereof being selected in such a manner that, when the cart moves under the bed frame 1, the U-shaped receiving means 41 of the cart 20 grips under or embraces the profile 40 so that no means which are moved mechanically relatively against one another are required for securing the bed frame on the cart.

The cart 20 is composed of frame elements 42 and 43 which form a trapezoid and are connected at least at the narrow end at which are also provided the U-shaped receiving means 41 and a bar-like handle 44. The frame elements 42 and 43 and the receiving means 41 are supported by wheels 45, 46 and 47, at least the last-mentioned wheel of which is preferably a caster wheel or is otherwise steerable. The carts can also be stacked one on top of the other and thus save space due to the cantilevers 18 and 19 which project outwardly and upwardly from the frame elements 42 and 43 and which have recesses 16 and 17 which correspond to the recesses 14 and 15 of the subframe 5. In place of the cantilevers 18 and 19 with the open recesses 16 and 17, the frame elements 42 and 43 can be turned to extend upwardly from the zone of the wheels 45 and 46 to the same height as the receiving means 41 and can thus form a rigid support for the bed frame over its entire length.

A perforated plate is inserted into the bed frame 1 in a manner which is not illustrated and a foamed-rubber mattress which is also not illustrated can then be supported on said plate. Thus, the bed can be sterilized in a very simple manner.

The invention is not limited to the illustrated embodiment. Thus, particularly the bed frame can be constructed differently or can be suspended differently, the subframe 5 with supports corresponding to the support arms 6 and 7 can be included under the plane of the bed frame and can project as desired. Also the elevational adjustment of the subframe in the vertical frame 3 is possible through a cable line or also hydraulically pneumatically. The inclination adjustment of the bed frame can also be done through hydraulic or pneumatic or electric means.

The turntable 24 can for example also have a construction which differs from the round shape and the arrangement of the storing plate 28 or the pan 29 can be adjusted to meet special requirements. Thus, the pan 29 or a part thereof could have a lockable compartment for medications. In place of the articulated bracket 25, a Nurnberger bracket or a suitable suspension which is adjustable in length and position would be possible.

A wash basin with installation for water supply and water drain can for example also be installed into the nightstand 31. However, it is important in providing all of these possible variations, that the organic-functional unit of hospital bed and auxiliary means required in this connection and serviceable for reasons of better well-being of the patient and which are provided according to the invention is maintained.

Although a particular preferred embodiment of the invention has been disclosed in detail for illustrative purposes, it will be recognized that variations or modifications of the disclosed apparatus, including the rearrangement of parts, lie within the scope of the present invention.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A hospital bed comprising:
elongated bed frame means for supporting a patient;
support frame means located adjacent to one end of said bed frame means and having vertically extending guide means thereon;
carriage means mounted on said guide means for vertical movement relative to said support frame means and means for effecting vertical movement of said carriage means;
arm means extending from said carriage means partway along said bed frame means, said arm means and said bed frame means having cooperating coupling means releasably securing said bed frame means to said carriage means and supporting said bed frame means for pivotal movement about a horizontal axis transverse to the longitudinal axis of said bed frame means, said bed frame means extending in a cantilevered manner outwardly from said carriage means which provides the sole support for said bed frame means.

2. A hospital bed according to claim 1, wherein said carriage means comprises a pair of horizontally spaced support arms adapted to provide a support for said bed frame means.

3. A hospital bed according to claim 2, wherein said carriage means additionally includes receiving means adapted for vertical movement relative to said support arms;
wherein each of said support arms includes means for pivotally supporting said bed frame means at a first location; and
wherein said receiving means includes means for supporting said bed frame means at a second location spaced from said first location whereby a relative vertical movement of said receiving means relative to said support arms will effect a tilting of said bed frame means about an axis defined by said means on said support arms.

4. A hospital bed according to claim 3, wherein said support frame means includes vertically extending track means; and
wherein said receiving means is mounted on said track means for vertical movement relative to said support arms.

5. A hospital bed according to claim 3, wherein said coupling means include first means defining a recess on each of said support arms, said recess means being horizontally and vertically aligned; and
including first pin means on said bed frame means receivable in said first recess means for pivotal movement relative thereto.

6. A hospital bed according to claim 5, wherein said coupling means additionally includes second means defining a recess on said receiving means; and
including second pin means on said bed frame means receivable in said second recess means.

7. A hospital bed according to claim 1, including wheel supported frame means defining a cart; and
including connecting means for connecting said bed frame means to said cart and for effecting a transporting of said bed frame means from one location to another when said releasable coupling means has released said bed frame means from said carriage means.

8. A hospital bed according to claim 7,
wherein said bed frame means includes spaced pin means thereon;
wherein said connecting means includes means defining spaced recesses on said cart adapted to receive and cooperate with said spaced pin means on said bed frame means;
including profile means on the free end of said bed frame means; and
wherein said cart includes receiving means for coupling said profile means to said cart.

9. A hospital bed according to claim 7, wherein said cart comprises a generally U-shaped frame having a narrow end and a wide end and a handle secured to said narrow end of said frame.

10. A hospital bed comprising:
elongated bed frame means for supporting a patient;
support frame means located adjacent to one end of said bed frame means and having vertically extending guide means thereon;
carriage means mounted on said guide means for vertical movement relative to said support frame means and means for effecting vertical movement of said carriage means;
arm means extending from said carriage means partway along said bed frame means, said arm means and said bed frame means having first cooperating coupling means releasably securing said bed frame means to said carriage means, said bed frame

means extending in a cantilevered manner outwardly from said carriage means;

wheel supported frame means defining a cart, said cart being separate from said bed frame means and having second cooperating coupling means for releasably connecting said bed frame means to said cart for effecting a transporting of said bed frame means from one location to another when said first coupling means has released said bed frame means from said carriage means.

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