Sept. 29, 1959 J. SCHLACKMAN ET AL 2,906,575

OVERBED TABLE AND CONNECTING LINKAGE THEREFOR

Filed Jan. 31, 1958

2 Sheets-Sheet 1

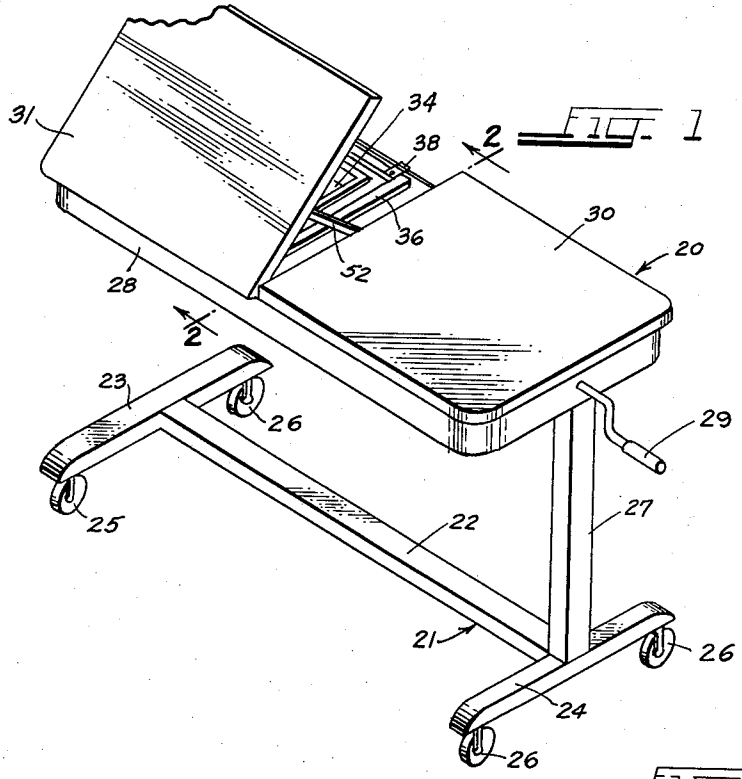

FIG. 1

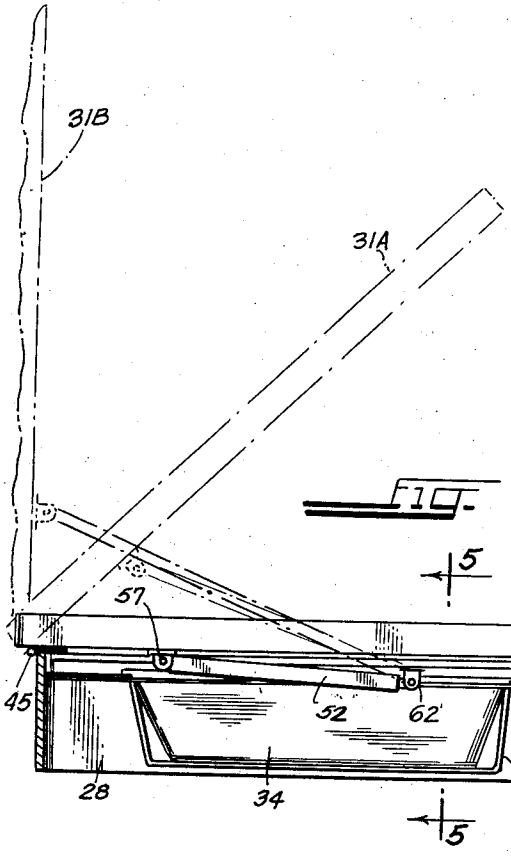

FIG. 2

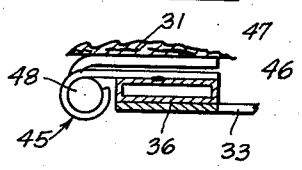

FIG. 3

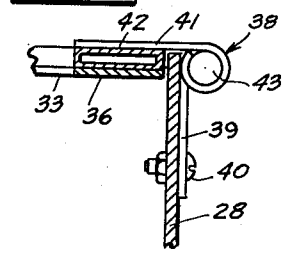

FIG. 4

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Filed Jan. 31, 1958 2 Sheets-Sheet 2

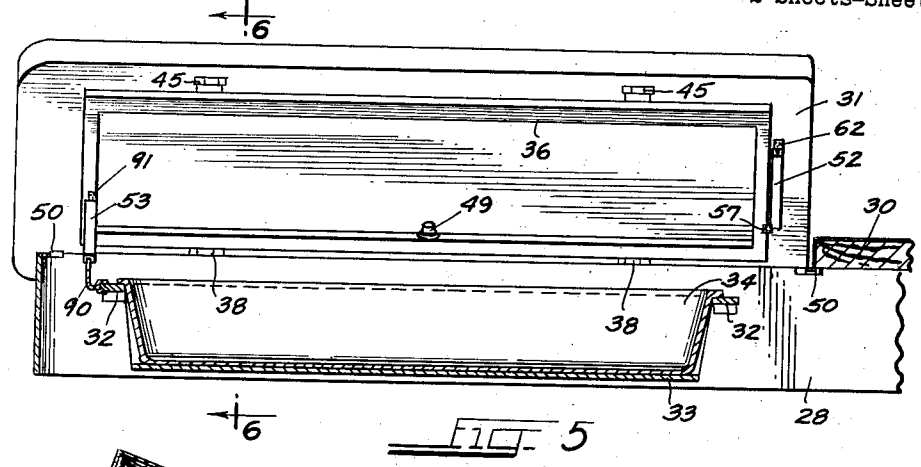

FIG. 5

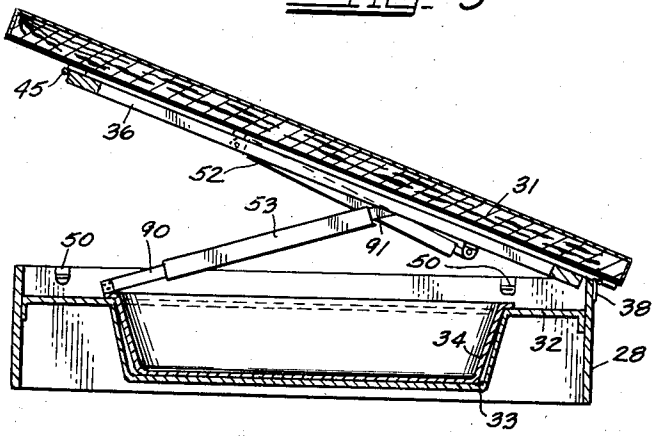

FIG. 6

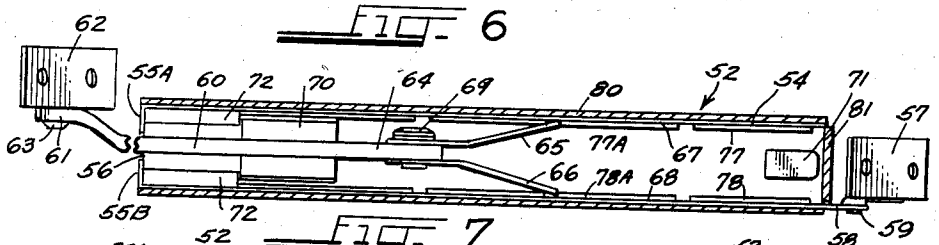

FIG. 7

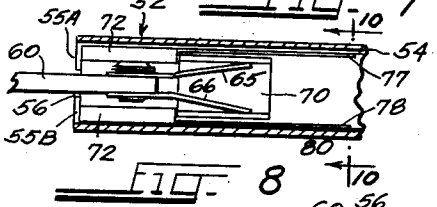

FIG. 8

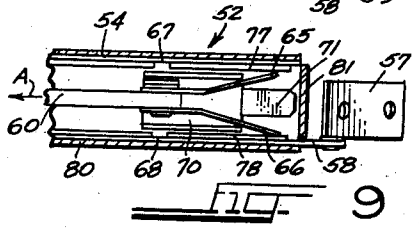

FIG. 9

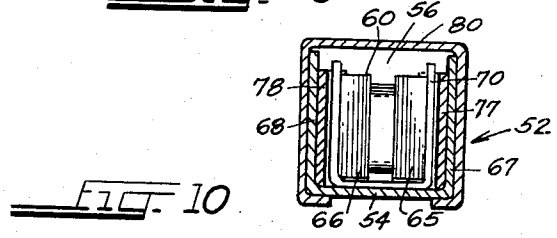

FIG. 10

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2,906,575

OVERBED TABLE AND CONNECTING LINKAGE THEREFOR

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Application January 31, 1958, Serial No. 712,436

6 Claims. (Cl. 311—38)

This invention relates to a new and improved tilting-top table construction and to a connecting linkage suitable for use in a table of this kind.

In some applications, it is highly desirable to employ a table having a top which may be conveniently maintained in any one of a number of angular positions with respect to the base of the table. A particular example of a table of this kind is an over bed table, utilized in hospitals and otherwise in the care of bed patients, having a table surface which may be elevated at an angle with respect to the table base to afford a convenient reading angle for the patient and for other purposes. Accordingly, the invention is described hereinafter in connection with a table of this kind, although it should be understood that it may also be applicable to other types of tables which require tilting of the table top to one or a series of stable positions.

In over bed tables, and in other applications as well, the table top should preferably be readily and conveniently movable to any of its angular positions without requiring the use of tools or other devices and without requiring substantial effort on the part of the table user. This is particularly important in tables which are to be utilized by bed patients, since in many instances the patients may be in generally weakened condition and may be able to exert only a minimum effort in adjusting the table. Consequently, the connecting linkage which determines the elevation angle of the table top should be extremely simple and convenient in operation and should provide for manipulation without the use of special tools, adjusting handles, or the like.

A primary object of the invention, therefore, is a new and improved tilting-top table which is simple and convenient in operation and which requires a minimum effort for adjustment to a number of different angular positions.

A more specific object of the invention is a new and improved tilting-top table which may be actuated by one hand to a number of different stable positions.

A further object of the invention is a new and improved connecting linkage for a tilting-top table or like device which affords a positive latching action to maintain a table top or like member in any one of a plurality of different positions.

Another object of the invention is a new and improved connecting linkage for a tilting-top table or like device which is simple and economical in construction and which affords relatively long operating life with a minimum of service difficulties.

Other and further objects of the present invention will be apparent from the following description and claims and are illustrated in the accompanying drawings which, by way of illustration, show preferred embodiments of the present invention and the principles thereof and what is now considered to be the best mode for applying those principles. Other embodiments of the invention embodying the same or equivalent principles may be used and structural changes may be made as desired by those

skilled in the art without departing from the present invention.

In the drawings:

Fig. 1 is a perspective view of an over bed table and is utilized to illustrate a typical application of the invention;

Fig. 2 is a sectional view of the top portion of the table of Fig. 1 taken along line 2—2 therein;

Fig. 3 is a detail view of a hinge construction employed in the over bed table;

Fig. 4 is a detail view of another hinge structure which may be utilized in the over bed table;

Fig. 5 is a sectional view of the table, taken as indicated by line 5—5 in Fig. 2 but with the top of the table in elevated position;

Fig. 6 is a sectional view taken along line 6—6 in Fig. 5;

Fig. 7 is an enlarged sectional view of a connecting linkage employed in the table of Figs. 1–6;

Fig. 8 is a detail view showing the connecting linkage of Fig. 7 in a different operating position;

Fig. 9 is an additional detail view illustrating another operating position for the connecting linkage; and

Fig. 10 is an enlarged sectional view of the connecting linkage taken along line 10—10 in Fig. 7.

The over bed table 20 illustrated in Fig. 1 is in many respects conventional in construction and includes a table support or standard 21 comprising a cross brace 22 to which there are affixed a pair of leg members 23 and 24. Suitable casters 25 and 26 are mounted upon the leg members 23 and 24 respectively and afford a floor-engaging support for the standard 21. The standard or support structure of the table further includes an upright member 27 which is mounted upon and projects upwardly from the center portion of the leg member 24 and which is utilized to support, in cantilever fashion, a table base member 28. In many applications, it may be necessary to raise or lower the table base member 28 with respect to the floor or other surface upon which the table is supported in order to accommodate the table to use with beds of varying height. Accordingly, a suitable elevating mechanism may be mounted within the upright member 27 and utilized to mount the base member 28 upon the table standard 21. This elevating mechanism, which may be controlled by an operating handle 29, may be of conventional construction; inasmuch as the elevating mechanism does not constitute a part of the present invention, no particular mechanical arrangement for this portion of the table is illustrated.

The over bed table 20 further includes a fixed table top member 30 which is mounted upon the base member 28 and which constitutes a rigid part of the table structure. In addition, the over bed table is provided with a second table top member 31 which is pivotally mounted upon the base member 28. The table top member 31, as more fully described hereinafter, is adapted to be moved from a corner position in which it is aligned with the fixed table top 30 to any one of a plurality of tilted positions in which the top member 31 is angularly displaced from its normal position.

The over bed table 20, as thus far described, may be substantially conventional in construction and in use. Thus, in operation, the table is disposed in alignment with a bed or couch, the base member 28 projecting over the top of the bed to afford ready access to a patient or other person in the bed. The lower portion of the table standard 21, comprising the cross member 22 and the leg member 23, projects underneath the bed, the upright member 27 being located immediately alongside the bed. With the top member 31 in its normal position, aligned with the fixed top 30, the table may be used for eating or for

other purposes requiring a substantially horizontal table surface. On the other hand, the top member 31 may be tilted to any one of a number of angular positions for greater convenience of the patient in reading or other occupations, as described more fully hereinafter.

In general, the mounting of the tilting table top member 31 upon the table base member 28 is best illustrated in Figs. 2–6. As indicated in these figures, and particularly in Figs. 2, 5 and 6, the base member 28 of the table is provided with a pair of fixed frame members 32 which extend across the base member 28; these frame members 32 are rigidly secured to the base member 28 by suitable means such as bolts or, preferably, by welding. An auxiliary sheet metal frame member 33 is mounted on two frame members 32 and secured thereto by suitable means such as by spot welding, riveting, or like known techniques. This auxiliary frame member 33 affords a depression or pocket within which a wash basin or pan 34 may be disposed.

The tilting table top structure of the over bed table 20 further includes a support member 36. In the illustrated construction, the support member 36 comprises a generally rectangular frame which is hinged to the table base member 28 by a pair of hinges 38. One of these hinges is illustrated in Fig. 4; as shown therein, it comprises a first hinge plate 39 which is secured to the base member 28 as by a plurality of bolts 40 or other like fastening means. A second hinge plate 41 is suitably fastened to the frame member 36 by suitable means; in this instance, the hinge plate 41 may be mounted upon the frame member 36 by spot welding as indicated by reference numeral 42. The two hinge plates 39 and 41 each engage a hinge pin 43, thereby affording a convenient and effective pivotal mounting for the support member 36 with respect to base member 28. As indicated in Figs. 2 and 4, when the hinges 38 are closed, the support member 36 is disposed within the confines of the base member 28 with the support member resting upon the upper surface of the auxiliary frame member 33.

The table top 31, on the other hand, is pivotally mounted upon the support member 36 by a pair of hinges 45, the pivotal connection between the table top and the support member 36 being at the opposite side of the table from the hinges 38 connecting the support member and the table base 28. Fig. 3 affords a detailed illustration of the hinge construction utilized in mounting the table top member upon the support member; as indicated therein, each of the hinges 45 may include a first hinge plate 46 which is spot welded or otherwise secured to the support member 36. A second hinge plate 47 is suitably affixed to the table top member 31, the two hinge plates being bent to embrace a hinge pin 48. In this instance, the two hinge plates extend substantially parallel to each other when the hinge is in its closed position as contrasted with the right angle relationship of the hinge plates in the hinges 38 when the latter are closed. In this manner, the table top member 31 is spaced a relatively short distance above the support member 36 and, when the table top member is disposed in its horizontal or closed position, it rests upon a plurality of brackets 50 affixed to the table base member 28. Preferably, the brackets 50 are provided with rubber cushions or like devices for engaging the undersurface of the table top 31. If desired, a spring latch or other latch device 49 may be used to hold the table top member 31 in alignment with the support member 36.

The table 20 is also provided with two connecting linkages 52 and 53. The connecting linkage 53 interconnects the support member 36 with one of the frame members 32 of the table base 28. This connecting linkage is utilized to maintain the support member 36 and table top 31 in any one of a series of angularly displaced positions with respect to the base member 28, as illustrated in Fig. 6. The other connecting linkage 52 extends between the table top member 31 and the support member 36 and is utilized to maintain the table top member in any one of a plurality of tilted positions with respect to the support member 36 and the base member 28 as indicated in Fig. 2. The two connecting linkages 52 and 53 are of substantially similar construction; accordingly, only the linkage 52 is described in detail hereinafter in connection with Figs. 7–10.

The connecting linkage 52 illustrated in Figs. 7–10 comprises an elongated channel 54 which, as illustrated in Fig. 10, is approximately U-shaped in cross sectional configuration. At one end, the channel is bent inwardly to form a pair of end wall sections 55A and 55B which are separated by a gap 56. A hinge 57 is mounted on the opposite end of the channel 54, being affixed to an extension portion 58 of one side wall of the channel. The hinge 57 may be extremely simple in construction and may be secured to the channel extension 58 by a rivet 59 which also constitutes the pivot pin of the hinge.

The connecting linkage 52 further includes an elongated link 60; on one end 61 of the link 60 there is mounted a hinge 62 which may be substantially similar to the hinge 57 and which may be conveniently secured to the link end 61 by means of a rivet 63 which also comprises the pivot pin of the hinge. The opposite or free end 64 of the elongated link 60 extends through the opening 56 into the channel 54. This free end 64 of the link 60 has secured to it a pair of latch elements 65 and 66 which normally extend outwardly from the link into engagement with the opposed side walls 67 and 68, respectively, of the channel 54. The resilient latch elements 65 and 66 preferably comprise simple leaf springs and may be secured to the link 60 by any suitable means such as a rivet 69.

A retainer member 70 is included within the linkage 52; this retainer member is substantially U-shaped in cross sectional configuration as best indicated in Fig. 10 and is disposed in encompassing relation to the link 60 intermediate the resilient latch elements 65 and 66 and the end walls 55A, 55B of the channel 54. The retainer member 70 is preferably made substantially smaller in its cross sectional dimensions than the channel 54 in order that the retainer member may be freely slidable within the channel. Moreover, the retainer member is relatively short in length as compared to the link 60 and the channel 54. Movement of the retainer member within the channel is restricted by limit means comprising a first lug 71 which is mounted at the end of the channel 54 opposite the walls 55A, 55B and a pair of additional lugs 72 which are mounted within the channel 54 immediately adjacent the end walls 55A, 55B. In addition, a series of shoulders are provided along the two opposed side walls 67 and 68 of the channel 54. In the illustrated embodiment, the shoulder means comprises a plurality of shoulder elements 77 spot welded or otherwise suitably affixed to the channel wall 67 at spaced intervals therealong; a similar series of shoulder elements 78 are secured to the wall 68 of the channel 54. A second channel member or cover 80 is disposed in encompassing relation to the channel 54 to prevent displacement of the link 60 from within the channel 54 and also to prevent excessive dirt or other foreign matter from accumulating in the connecting linkage. Preferably, the cover 80 is crimped or otherwise affixed to the channel 54 and the end portion 81 of the cover may be bent to afford an enclosing end wall at the hinge end of the channel 54.

When the connecting linkage 52 is installed in the table 20, the hinge 57 is affixed to one of the support and table top members 36 and 31 respectively. In the illustrated embodiment, for example, the hinge 57 may be affixed to the underside of the table top member 31; thus the end of the channel 54 comprising the wall sections 55A and 55B constitutes the free end of the connecting linkage channel. The hinge 62, on the other hand, is secured to the other of the support and table top members and in this instance is suitably mounted

upon the support member **36**. Thus, it is seen that the free end **64** of the link **60** extends into the free end of the channel **54**. Moreover, the connecting linkage is mounted upon the support and table top members with the link **60** extended to its maximum extent into the channel **54**, as illustrated in Fig. 9 and is explained more fully hereinafter.

Starting from the normal position shown in Fig. 9, the link **60** slides within the channel **54** in the direction indicated by arrow A as the table top **31** is tilted upwardly to the position **31A** shown in Fig. 2. The position **31A** of the table top member corresponds generally to the linkage position illustrated in Fig. 6, in which the resilient latch elements **65** and **66** engage the shoulder elements **77A** and **78A** to prevent movement of the link **60** back into the channel **54**, thereby preventing return movement of the table top to its normal or horizontal position. The table top remains in the intermediate stable position **31A** as long as desired and will support a substantial weight.

Subsequently, it may be desired to return the table top **31A** to its initial position. For this purpose, the table top member is elevated to the limit position indicated by phantom outline **31B** in Fig. 2. When this is done, the elongated link **60** is substantially fully withdrawn from the channel **54** to the position shown in Fig. 8. As the link **60** is withdrawn from the channel **54**, it moves the retainer member **70** toward the rear wall **55A**, **55B** of the channel **54** until the retainer member encounters the limit means comprising the two lugs **72**. The lugs interrupt movement of the retainer but do not immediately prevent continued movement of the link **60**. As a consequence, the continuing movement of the link **60** brings the resilient latch elements **65** and **66** into engagement with the retainer member **70**, the latch elements being drawn into the retainer element in a manner such that they are effectively disengaged from the side walls of the channel **54**. The resilient nature of the leaf springs **65** and **66** causes them to engage the retainer member **70** firmly, with the result that the link **60** can be moved in a direction opposite arrow A toward the normal position illustrated in Fig. 9 without encountering any interference between the resilient latch elements **65** and **66** and the shoulder elements **77** and **78**. Thus, from the limit position **31B**, the table top member **31** is freely pivotally movable back to the normal position shown in solid outline in Fig. 2.

As the table top member is returned to its normal or horizontal position, the link **60** is of course moved inwardly of the channel **54**. Moreover, the retainer element **70** is constrained to move along with the link **60**, being gripped by the two resilient latch elements **65** and **66**. When the retainer element **70** reaches the position shown in Fig. 9, however, it engages the additional limit means comprising the lug **71**. Lug **71**, like the lugs **72**, interrupts movement of the retainer member without interfering with continued movement of the link **60**. Consequently, the final movement of the table top member **31** to its normal position effectively shifts the link **60** relative to the retainer member **70** and frees the retainer member from its engagement with the resilient latching elements **65** and **66**. Thus, return of the table top member **31** to its normal or starting position effectively conditions the connecting linkage **52** for further use of the latching elements **65** and **66** in retaining the linkage in any of the intermediate positions defined by the shoulder elements **77** and **78**.

In those applications in which the table is required to support a substantial weight or may otherwise be loaded in a manner which imposes a substantial stress upon the connecting linkage **52**, the use of dual latch elements such as the elements **65** and **66** is desirable in that it affords substantial weight-bearing capacity. On the other hand, in many applications, including the over bed table **20**, the load requirements on the table may be relatively light. Under these circumstances, it is not necessary to utilize both of the latching elements **65** and **66** to retain the connecting linkage in any of its intermediate positions. Rather, the shoulder elements along one wall of the channel **54** may be eliminated entirely, in which case the shoulder elements on the other wall may carry the entire load. By the same token, one of the spring members **65** and **66** may also be omitted, provided some other bearing element is secured to the free end of the connecting link **60** to maintain the link in the desired alignment within the channel **54**. These relatively minor modifications of the linkage require only the omission of parts and and are well within the skill of an ordinary mechanic; accordingly, they have not been illustrated in the drawings. It will of course be understood that it is not necessary that separate sheet metal or other shoulder elements **77** or **78** be utilized in constructing the connecting linkage; rather, the shoulders necessary to operation of the device may be formed by punching out sections of the side walls of the channel **54** or by other suitable structural expedients.

The second connecting linkage **53** is substantially similar in construction to the connecting linkage **52** and extends between the support member **36** and the table base **28**. In the arrangement illustrated in Fig. 6, the link member **90** of the connecting linkage **53** corresponds to the link **60** of the device **52** and is secured at its hinged end to the frame member **32** of the table base **28**. The channel member **91** of the linkage **53**, on the other hand, is affixed at its hinged end to the support member **36**. Operation of the connecting linkage **53**, which establishes a series of stable intermediate positions for the support member **36** with respect to the base member **28**, is substantially as described hereinabove in connection with the linkage **52**. Thus, the table top member **31** and the support member **36** form a first pivotal unit, the members of which are interconnected by the linkage **52**, whereas the support member **36** and the table base member **28** form a second pivotal unit interconnected by the linkage **53**, the operation of the two pivotal units being essentially similar to each other. In the bed table **20**, of course, the pivotal unit comprising the table top member **31A** and the support member **36** may be actuated to any of several stable operating positions to afford a tilted table surface for the patient, whereas the pivotal unit comprising the support member **36** and the base member **28** may be actuated to one of a series of tilted positions to provide access to the basin **34**.

The construction of the connecting linkages of the invention is extremely simple and economical, since virtually all of the parts may be stamped from relatively light weight sheet metal stock. The linkages are particularly well adapted to a totally enclosed construction, making them relatively simple and convenient to clean and preventing accumulation of foreign material in the linkages, which might interfere with their operation. The effort required to actuate the linkages is extremely small and they may be controlled completely without recourse to separate tools, operating handles, or the like.

While preferred embodiments of the invention have been described and illustrated, it is to be understood that these are capable of variation and modification. Accordingly, the aim in the appended claims is to cover all such variations and modifications as may fall within the true spirit and scope of the invention.

We claim:

1. In a table of the kind including a support member and a table top member mounted for pivotal movement between a normal position adjacent said support member and a limit position angularly displaced from said support member, a connecting linkage comprising: an elongated channel hingedly connected at one end to a first one of said support and table top members; an elongated link, hingedly connected at one end to the other of said

support and table top members and having a free end extending into the free end of said channel for longitudinal sliding movement therein between a normal position in which a substantial portion of said link is disposed within said channel and a limit position substantially withdrawn from said channel; a resilient latch element, affixed to said link and normally extending therefrom into engagement with one wall of said channel; a retainer member, disposed within said channel for sliding movement therein, for engaging said latch element to deflect said latch element from engagement with said wall of said channel whenever said link is moved to its limit position and releasable from said latch element by movement of said link to its normal position; and means affording at least one shoulder along said wall of said channel for engaging said latch element to prevent movement of said link toward its normal position when said retainer is disengaged from said latch element.

2. In a table of the kind including a support member and a table top member mounted for pivotal movement between a normal position adjacent said support member and a limit position angularly displaced from said support member, a connecting linkage comprising: an elongated channel hingedly connected at one end to a first one of said support and table top members; an elongated link, hingedly connected at one end to the other of said support and table top members and having a free end extending into the free end of said channel for longitudinal sliding movement therein between a normal position in which a substantial portion of said link is disposed within said channel and a limit position substantially withdrawn from said channel; a resilient latch element, affixed to said link and normally extending therefrom into engagement with one wall of said channel; a retainer member, disposed within said channel for sliding movement therein in response to movement of said link, for releasably engaging said latch element to deflect said latch element from engagement with said wall of said channel; limit means, mounted within said channel, for effectively moving said retainer member relative to said link to engage said retainer with said latch element whenever said link is moved to its limit position and to release said retainer member from said latch element whenever said link is moved to its normal position; and means affording at least one shoulder along said wall of said channel for engaging said latch element to prevent movement of said link toward its normal position when said retainer is disengaged from said latch element.

3. In a table of the kind including a support member and a table top member mounted for pivotal movement between a normal position adjacent said support member and a limit position angularly displaced from said support member, a connecting linkage comprising: an elongated substantially completely enclosed channel hingedly connected at one end to a first one of said support and table top members; an elongated link, hingedly connected at one end to the other of said support and table top members and having a free end extending into the free end of said channel for longitudinal sliding movement therein between a normal position in which a substantial portion of said link is disposed within said channel and a limit position substantially withdrawn from said channel; a pair of resilient latch elements, each comprising a leaf spring affixed to said link, said latch elements normally extending from said link into engagement with opposed walls of said channel; a retainer member, disposed within said channel for sliding movement therein, for engaging said latch elements to deflect said latch elements from engagement with said wall of said channel whenever said link is moved to its limit position and releasable from said latch elements by movement of said link to its normal position; and means affording a plurality of shoulders along one of said walls of said channel for engaging the corresponding one of said latch elements to prevent movement of said link toward its normal position when said retainer is disengaged from said latch elements thereby affording a corresponding plurality of stable angular positions for said table top member relative to said support member.

4. In a table of the kind including a support member and a table mounted for pivotal movement between a normal position adjacent said support member and a limit position angularly displaced from said support member, a connecting linkage comprising: an elongated substantially completely enclosed channel hingedly connected at one end to a first one of said support and table top members; an elongated link, hingedly connected at one end to the other of said support and table top members and having a free end extending into the free end of said channel for longitudinal sliding movement therein between a normal position in which a substantial portion of said link is disposed within said channel and a limit position substantially withdrawn from said channel; a resilient latch element, comprising a leaf spring affixed to said link adjacent the free end thereof and normally extending therefrom into engagement with one wall of said channel; a retainer member, disposed within said channel for sliding movement therein in response to movement of said link, for releasably engaging said latch element to deflect said latch element from engagement with said wall of said channel; a first lug, mounted within said channel adjacent the free end thereof, for blocking movement of said retainer member as said link nears said limit position to effectively move said retainer member relative to said link and engage said retainer member with said latch element whenever said link is moved to its limit position; a second lug, mounted within the channel adjacent the hinged end thereof, for blocking movement of said retainer member as said link nears said normal position to effectively move said retainer member relative to said link and release said retainer member from said latch element whenever said link is moved to its normal position; and means affording at least one shoulder along said wall of said channel for engaging said latch element to prevent movement of said link toward its normal position when said retainer is disengaged from said latch element.

5. A unidirectional multi-position connecting linkage comprising: an elongated channel; an elongated link, having one end extending into a given end of said channel for longitudinal sliding movement therein between a normal position in which a substantial portion of said link is disposed within said channel and a limit position substantially withdrawn from said channel; a pair of resilient leaf spring latch elements, affixed to said link adjacent said one end thereof and normally extending therefrom into engagement with opposed walls of said channel; a substantially U-shaped retainer member, disposed within said channel for sliding movement therein, for engaging said latch elements to deflect said latch elements from engagement with said walls of said channel whenever said link is moved to its limit position and releasable from said latch elements by movement of said link to its normal position; and means affording a plurality of shoulders along at least one of said walls of said channel for engaging said latch elements to prevent movement of said link toward its normal position from any one of a series of intermediate positions when said retainer is disengaged from said latch elements.

6. A unidirectional multi-position connecting linkage comprising: an elongated channel; an elongated link, having one end extending into a given end of said channel for longitudinal sliding movement therein between a normal position in which a substantial portion of said link is disposed within said channel and a limit position substantially withdrawn from said channel; a resilient latch element, affixed to said link and normally extending therefrom into engagement with one wall of said channel; a retainer member, disposed within said channel for sliding movement therein in response to movement of

said link, for releasably engaging said latch element to deflect said latch element from engagement with said wall of said channel; lug means, disposed within the opposite ends of said channel, for engaging said retainer member to effectively move said retainer member relative to said link and engage said retainer member with said latch element whenever said link is moved to its limit position and release said retainer member from said latch element whenever said link is moved to its normal position; and means affording at least one shoulder along said wall of said channel for engaging said latch element to prevent movement of said link toward its normal position when said retainer is disengaged from said length element.

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