Aug. 19, 1924. 1,505,437

A. SCHWEIZER

INVALID APPLIANCE FOR BEDS

Filed June 30, 1922 3 Sheets-Sheet 1

FIG. 2.

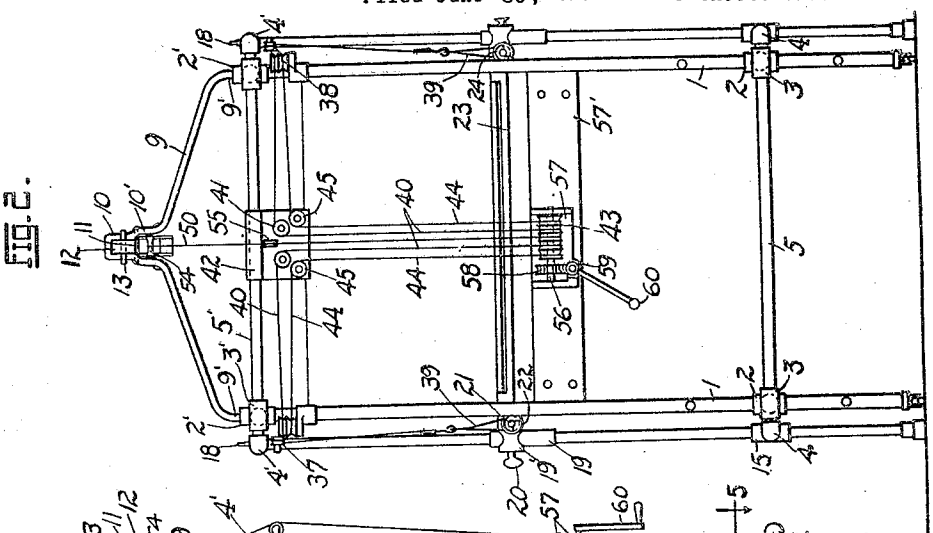
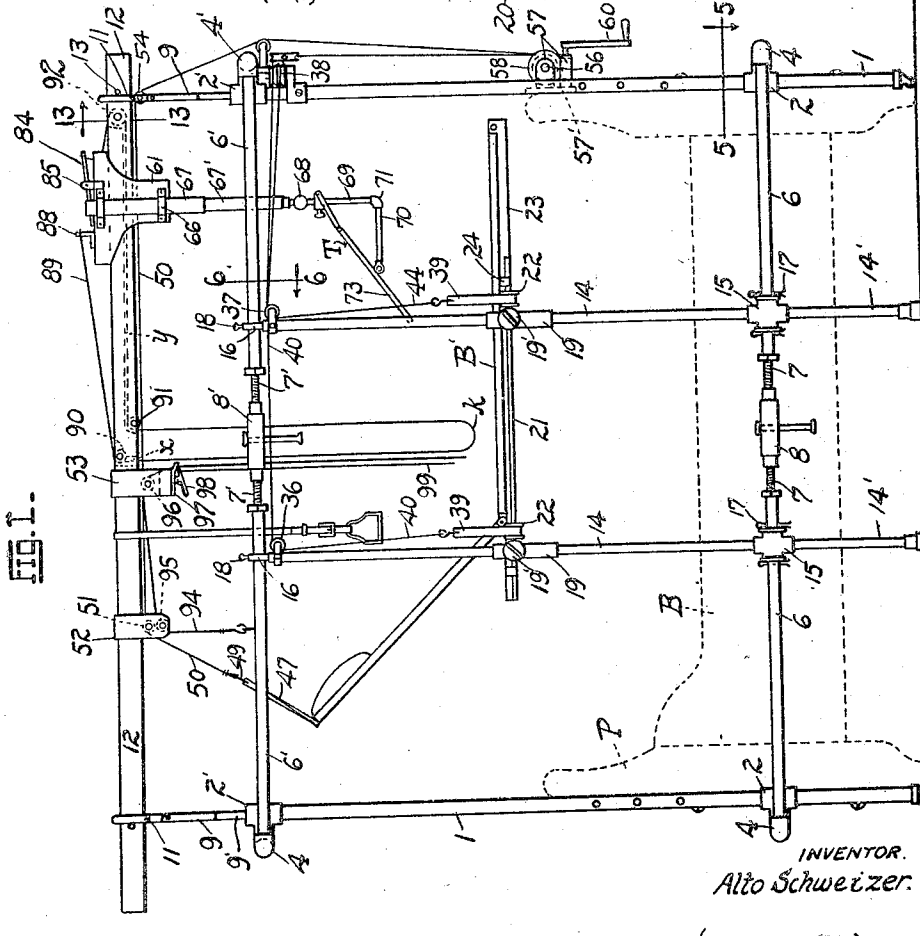


FIG. 1.



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Aug. 19, 1924. 1,505,437

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INVALID APPLIANCE FOR BEDS

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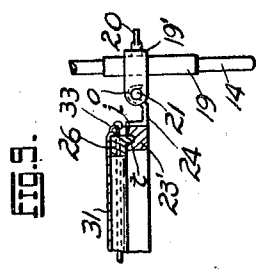

FIG. 9.

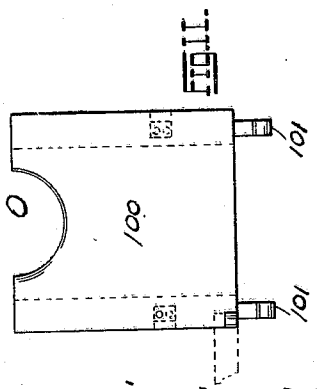

FIG. 11.

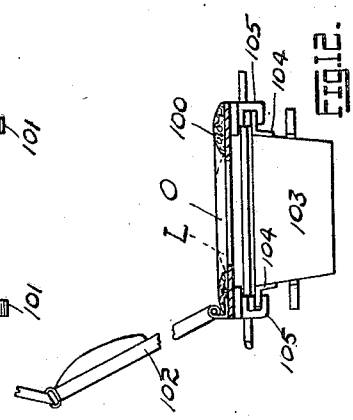

FIG. 12.

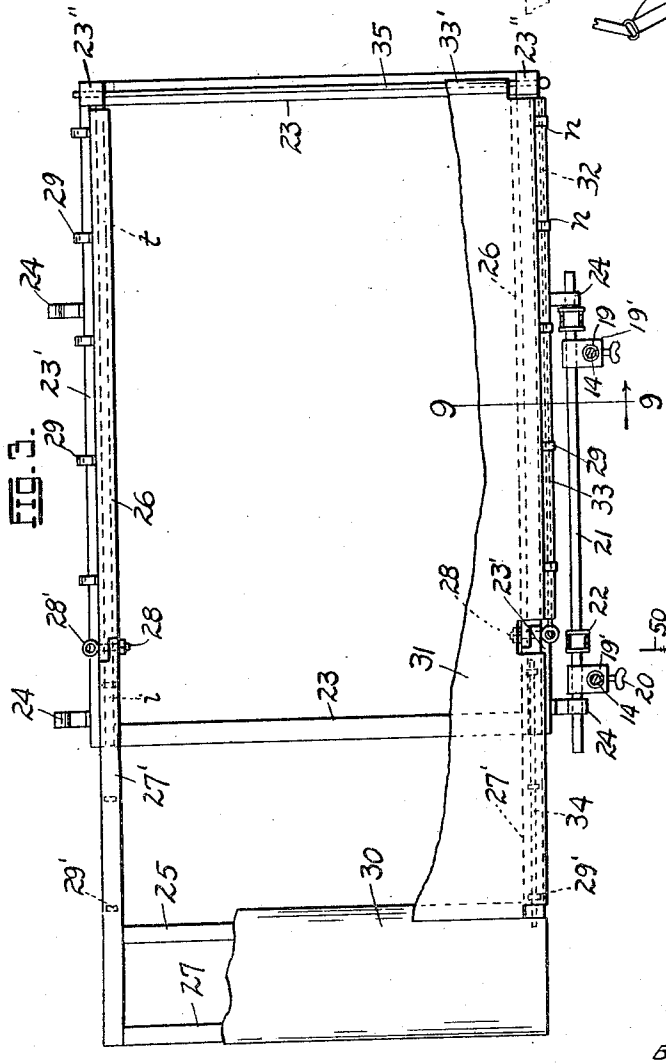

FIG. 3.

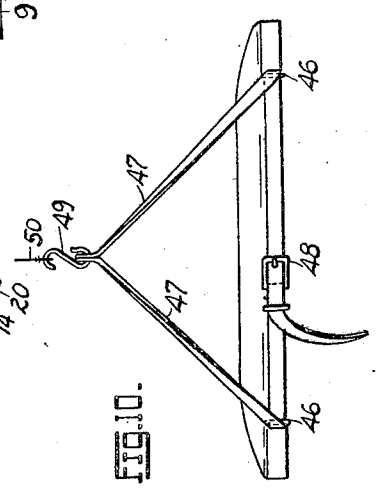

FIG. 10.

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INVALID APPLIANCE FOR BEDS

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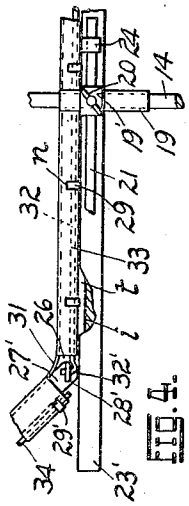

FIG. 4.

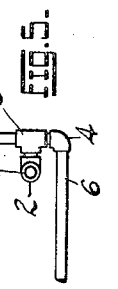

FIG. 5.

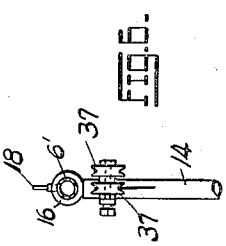

FIG. 6.

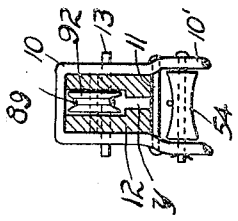

FIG. 13.

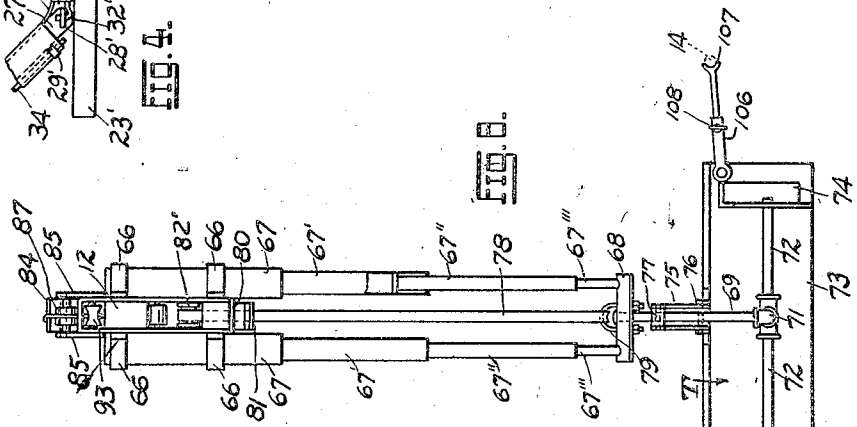

FIG. 8.

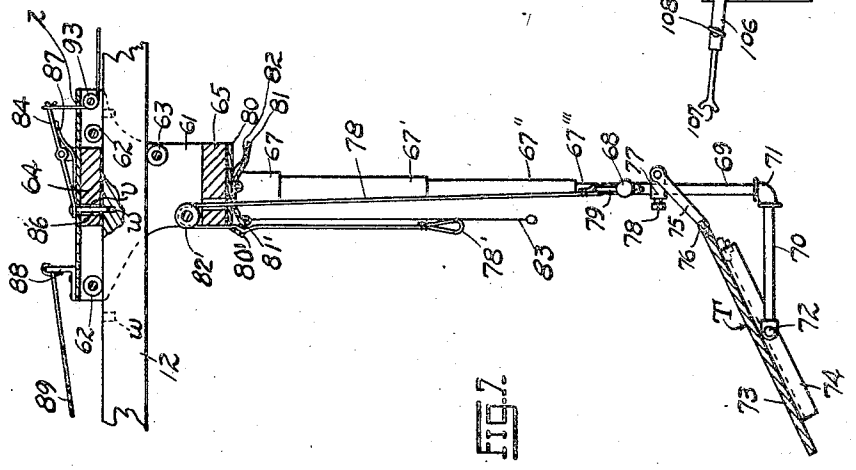

FIG. 7.

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Patented Aug. 19, 1924. 1,505,437

UNITED STATES PATENT OFFICE.

ALTO SCHWEIZER, OF ERLING, OBERBAYERN, GERMANY, ASSIGNOR TO CHARLES SCHWEIZER, OF ST. LOUIS, MISSOURI.

INVALID APPLIANCE FOR BEDS.

Application filed June 30, 1922. Serial No. 571,870.

To all whom it may concern:

Be it known that I, ALTO SCHWEIZER, a citizen of the German Republic, residing at Erling, Oberbayern, Germany, have invented certain new and useful Improvements in Invalid Appliances for Beds, of which the following is a specification.

My invention has relation to improvements in invalid appliances for beds, and consists in the novel features of construction more fully set forth in the specification and pointed out in the claim.

The objects of the invention are: to provide a frame about a bed which supports an auxiliary bed-bottom capable of being elevated for the purpose of making and airing the bed; to provide a back-rest on said bottom that may be operated by the patient himself; to provide a seat that may be supported by said frame in lieu of the auxiliary bed-bottom; to provide a traveling table for the patient that may be brought into position for reading or writing by the patient himself. Other objects will be better apparent from a detailed description of the invention in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of my invention with the auxiliary bed-bottom in elevated position so as to enable the attendant to make the bed below and air the same; Fig. 2 is an end elevation of the appliance with the traveling table omitted; Fig. 3 is a plan view of the auxiliary bed-bottom with parts broken away; Fig. 4 is a side elevation of the auxiliary bed-bottom with parts broken away; Fig. 5 is a cross-sectional detail of the supporting frame taken on the line 5—5 of Fig. 1; Fig. 6 is a cross-sectional detail taken on the line 6—6 of Fig. 1; Fig. 7 is a middle vertical longitudinal section of the traveling table; Fig. 8 is a rear elevation thereof; Fig. 9 is a cross-sectional detail of the auxiliary bed-bottom taken on the line 9—9 of Fig. 3; Fig. 10 is a rear elevation of the back-rest; Fig. 11 is a plan view of half the seat; Fig. 12 is a middle cross-section through the seat with the back-rest attached; and Fig. 13 is a cross-section through the rail that supports the traveling table taken on the line 13—13 of Fig. 1.

Referring to the drawings, B represents a bed in dotted outline to the posts P of which are secured the upright corner pipes 1 of the supporting frame F. Each post 1 carries a T 2 a short distance from the bottom, said T being connected on the outside of the post 1 to a second T 3 to which is connected an elbow 4. The T's are connected at the ends of the frame F by a pipe 5, and the elbows 4 are connected at the sides by pipes 6, 6 terminating on the inner ends in threaded stems 7, 7 which are connected by a take-up sleeve 8 for making the frame rigid.

The posts 1 are similarly connected at the top by T's 2′, 3′, elbow 4′, and pipes 5′, 6′, with a take-up 8′. An arch 9 having vertical sides 9′, 9′ which enter the pipes 1 at each end, is adjustably mounted in the pipes 1, 1, said arch having a contracted portion 10 at the center which widens slightly at 10′ before inclining downwardly to the sides 9′, 9′. Between the contracted portions 10 and 10′ of the arches are rivets 11, 11, and a rail 12 is slipped into the contracted portions 10 of the arches, said rail resting on the rivets and being confined by pins 13, 13 run through the rail just outside of portions 10 of the arches. The parts thus far described constitute the fixed frame for my improved invalid apparatus now to be described. Obviously this frame may be modified, the construction herein shown being merely one form of many.

Four upright rods 14 (two on each side) are slidingly mounted on pipes 6 and 6′, being provided for this purpose with cross-fittings 15, 15 at the bottom which slide freely on rods 6 and with rings 16, 16 screwed into the top of the uprights which slide freely on rods 6′, the crosses being held in any position by cotter pins 17, 17 passed through holes in pipes 6 on both sides of rods 14, and the rings being held to the pipes 6′ by thumb-screws 18. The rods 14 have extensions 14′ extending from the crosses 15 to the floor to take the strain off the pipes 6, 6 and 6′, 6′.

An auxiliary bed-bottom B′ in the shape of a stretcher is suspended between the rods 14 directly over the bed B, said bed-bottom B′ resting on the bed B normally and serving as an under-sheet for bed-ridden patients. The manner of accomplishing this together with its purpose will presently appear. The rods 14 each have a sleeve 19 slidingly mounted on them, which is provided with a boss 19′, in the outer face of

which is screw-threaded a thumb-screw 20 for binding the sleeve to the rod when desired, the boss 19′ extending inwardly and having a transverse opening *o* through which is passed a carrying rod or bar 21, the latter resting in the openings *o* of the bosses 19′ on the same side of the apparatus. There are a pair of these bars 21 (one on each side, parallel with the sides of the bed B) and two rollers 22 are mounted in spaced relation on each bar 21. A frame 23 is mounted on the bars 21 by means of side brackets 24, 24 fixed to the sides of the frame.

The frame 23 has resting on it a second frame 25 having side bars 26, 26 which are provided with tongues *t*, *t* extending throughout their length, each tongue resting in a groove *i* formed in each of the side bars 23′, 23′ of the frame 23. The frame 25 is provided with a back-rest 27 having its side bars 27′, 27′ hinged to the side bars 26, 26 of frame 25 by an eye-bolt 28, the eye 28′ being on the outside of the bars for a purpose presently to appear. On the outside faces of the bars 26, 26 are a series of screw-eyes 29, and on the under faces of bars 27′, 27′ are a series of screw-eyes 29′, the former extending throughout the length of the bars 26, and the latter extending from the eye-bolt 28 to a cushioned head-rest 30 at the free end of the back-rest 27, and a canvas sheet 31 is stretched over the frame 25 and held taut by rods 32, 32 passed through marginal loops 33, 33 at the sides of the canvas, said rods also passing through the screw-eyes 29, the canvas having notches *n* cut in the margins to receive said screw-eyes. The canvas sheet 31 extends up to the head-rest 27 of the back-rest 25 and is held taut on the back-rest by rods 34, 34 which are passed through the loops 33 and screw-eyes 29′. The ends of the side bars 23′, 23′ are turned up at 23″, 23″, and the foot end of the sheet 31 is also provided with a loop 33′, the ends 23″, 23″ being perforated to receive a rod 35 which also passes through the loop 33′ to hold the foot end of the sheet 31 from sagging. The head end of the sheet 31 rests on the head-rest 27. From the foregoing it will be seen that when the sheet 31 is properly stretched on frame 25 it will be absolutely taut and free from wrinkles, so that a patient may lie for a long time without getting bed sores invariably caused by wrinkled bed covering. It is also apparent that the sheet may be easily removed when soiled merely by pulling out the rods 32, 34, and 35. When the sheet 31 is in place the rods 32 have their upwardly turned inner ends 32′ slipped into the eyes 28′.

The two posts 14 near the head end of the apparatus each have a pulley 36 mounted at their upper ends, and the posts 14 near the foot end of the apparatus each have a pair of pulleys 37, 37 mounted near their upper ends, and the two posts 1 at the foot end each have a pair of pulleys 38 mounted just below the pipes 6′.

Now the rollers 22 have straps 39 looped under them, the ends of the straps at the head end being suitably connected to wires (or cords) 40, 40 which pass upwardly over pulleys 36, thence rearwardly over inner pulleys 37, over upper pulleys 38, and thence over pulleys 41, 41 mounted on a plate 42 fixed to the middle of pipe 5′, the wires extending downwardly from pulleys 41, 41 to a grooved roller 43 to which they are secured. The ends of the straps 39 nearest the foot end are connected to wires 44 which pass upwardly over outer pulleys 37, thence over lower pulleys 38, and inwardly over pulleys 45, 45 also mounted on plate 42, and thence downwardly to roller 43 to which they are secured. The free end of the back-rest 27 has a pair of loops 46 fixed to it in spaced relation, and straps 47, 47 connected by a buckle 48 pass through these loops, the upper ends of the straps 47 being connected by an S-hook 49 to a wire 50 which passes over a pulley 51 in a housing 52 suspended from rail 12, thence rearwardly through a second housing 53 also suspended from rail 12, over a pulley 54 and downwardly over pulley 55 mounted on plate 42 to the middle groove of the roller 43, where the wire 50 is secured. The roller 43 is fixed to a shaft 56 mounted on a bracket 57 on a plate 57′ secured to the foot end of bed B, and a worm-wheel 58 is also fixed to the shaft 56, said worm-wheel meshing with a worm 59 mounted in bracket 57. The outer end of the worm 59 has a crank-handle 60 secured to it, on turning which in the proper direction the roller 43 is rotated, thus winding or unwinding the wires 40, 44, and 50, and raising or lowering the entire bed-bottom B′, provided, of course, that the thumb-screws 20 are unscrewed. The back-rest 27 may be raised or lowered independent of the frame 23, by taking up or letting out of the straps 47, 47.

The bed-bottom B′ is normally resting on the bed B, but when the attendant wishes to make the bed or cool the same, the bed-bottom B′ is elevated as just described, without any inconvenience to the patient, by merely turning the crank 60. In order to prevent the bed-bottom from accidentally falling down the thumb-screws 20 are tightened, which binds the sleeves 19 to the uprights 14.

Should the patient desire to read or write, a traveling table T is provided, the same comprising a housing 61 in which are two rollers 62, spaced apart and adapted to ride on the rail 12, and a roller 63 which bears on the under side of rail 12 to hold the table

against rocking, a block 64 being fixed in the housing between rollers 62, and a block 65 closing the housing 61 at the bottom. Fixed to the sides of the housing 61 by straps 66 are tubes 67 to each of which is telescopically connected a series of telescoping sections 67′, 67″, and 67‴, and a cross-bar 68 is connected to the two lower sections 67‴, 67‴. A standard 69 is secured to the middle of the cross-bar 68, and a table supporting arm 70 is connected by an elbow 71 to the lower end of said standard, said arm having laterally projecting branches 72, 72 which support the table-board 73 by having angles 74, 74 fixed to the bottom of the table-board, rotatably mounted on them. In order to hold the table-board 73 in properly inclined position, a pair of links 75, 75 are pivotally connected at one end to lugs 76, 76 projecting from the inner edge of said board, the other ends of the links being pivotally connected to a block 77 slidably mounted on the standard 69, a set-screw 78 being provided to secure the block 77 in adjusted position. The table-board 73 may be raised or lowered by means of a strap 78 secured at its lower end to a U-bolt 79 in the cross-bar 68, said strap passing through a block 65 and a toothed plate 80 and dog 81 mounted thereon, then over a pulley 82′ in the housing 61 and downwardly from said pulley through an opening adjacent the toothed end 80′ of plate 80, a loop 78′ being provided at the free end of the strap 78 for the patient to catch hold of when he wishes to raise or lower the table. The dog 81 is pivoted to the plate 80, and a spring 82 causes the nose 81′ of said dog to bear on the strap 78 and force it into contact with the teeth 80′ of the plate 80, thus binding the strap against movement in a direction to lower the table. However, the teeth 80′ are so pitched that the loop end of the strap may be pulled down to raise the table if desired. In order to release the dog 81 from the strap preliminary to lowering the table, a cord 83 is connected to the nose 81′ of the dog, a pull on said cord overcoming the tension of spring 82 and permitting the operator to let the table down by letting out on the strap 78.

A lever 84 is pivotally mounted between a pair of ears 85, 85 over the top of the housing 61, the inner end of said lever carrying a pin 86 operating through a hole v in block 64, said pin being urged into one of a number of sockets w in the top face of the rail 12, by a spring 87 which is fixed to the top of the housing and bears against the outer arm of the lever 84, and a lug 88 is secured to the housing on the end opposite the lever. A cord 89 has one end secured to the lug 88, the cord then passing rearwardly to about the middle of the rail where it traverses a pulley 90 mounted in a recess in the rail, then passes downwardly through a hole x in the rail to a loop k, then upwardly over a pulley 91 also mounted in a longitudinal recess y in the rail through which the cord 89 extends to a pulley 92 mounted in the rear end of recess y, the cord then passing beneath a pulley 93 mounted in the housing 61, and up through an opening z in the top of the housing to the free end of lever 84, where the cord is fastened. It will thus be seen that if the loop k is grasped by a patient on the bed-bottom B′, and both sides of the cord 89 made taut, the lever 84 will be oscillated to pull the pin 86 out of socket w when the table may be pulled forward or backward as desired.

When the patient is able to sit up in bed the back-rest 27 is disconnected from the cord 50 and connected to one end of a strap 94, said strap passing over a pulley 95 mounted in housing 52 below the pulley 51, the strap then passing over a pulley 96 mounted in the housing 53, and downwardly through a toothed plate 97 where it is engaged by a spring-pressed dog 98 (said plate and dog being similar to plate 80 and dog 81 above described), the strap 94 then continuing downwardly to within easy reach of the bed-bottom B′ when the same is in lowered position over the bed B. The dog 98 is released from the strap 94 by a cord 99.

When desired, the bed-bottom B′ may be removed from the carrying rods 21, 21, and a seat 100 placed on the rods in its stead, said seat being supported on the rods by brackets 101, and a separate back-rest 102 connected to it. This back-rest 102 is manipulated in the same manner as back-rest 27.

The seat 100 is provided with an opening O over which a lid L (dotted Fig. 12) is placed, said lid being removed for the accommodation of the patient's wants, and a pan 103 positioned below the seat and held in place by brackets 104 on each side thereof, which are adapted to slide in grooves 105 on the bottom of the seat.

If necessary, the table-board 73 may be braced against lateral movement by a pair of extensible braces 106 pivoted at the sides of the table-board (Figures 7 and 8) the outer ends 107 of the extensions being grooved to engage the uprights 14 against which they are held by tightening the thumb-screws 108.

Having described my invention, I claim:

In an apparatus of the class described, the combination with a bed-stead of a frame-work positioned around the bed-stead, said frame-work comprising a pair of corner posts at each end, an arch connecting the upper ends of the posts of each pair of corner posts, a rail supported by said arches, and a pair of upright posts on each side of the bed-stead intermediate the corner posts, an auxiliary bed-bottom slidingly mounted

on said upright posts, means for raising and lowering said bed-bottom, an adjustable back-rest pivotally connected to the bed-bottom, a strap suspended from the aforesaid rail and connected at one end to the back-rest, the other end of said strap terminating within easy reach of the bed-bottom, means on the rail for gripping the strap to hold the back-rest in any desired position, and means for releasing said grip.

In testimony whereof I hereunto affix my signature.

ALTO SCHWEIZER.

Witnesses:

ALEXEI PHILIPPOFF,

A. MUDEGER.