(No Model.)

J. T. WOODS.

HYDROSTATIC BED.

No. 489,517. Patented Jan. 10, 1893.

Fig. 1.

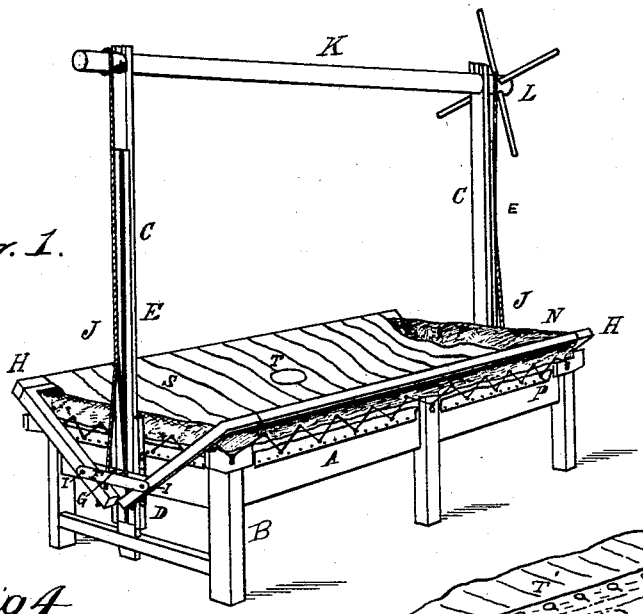


Fig. 3.

Fig 4.

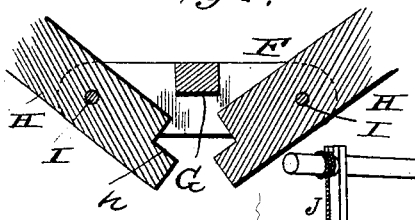
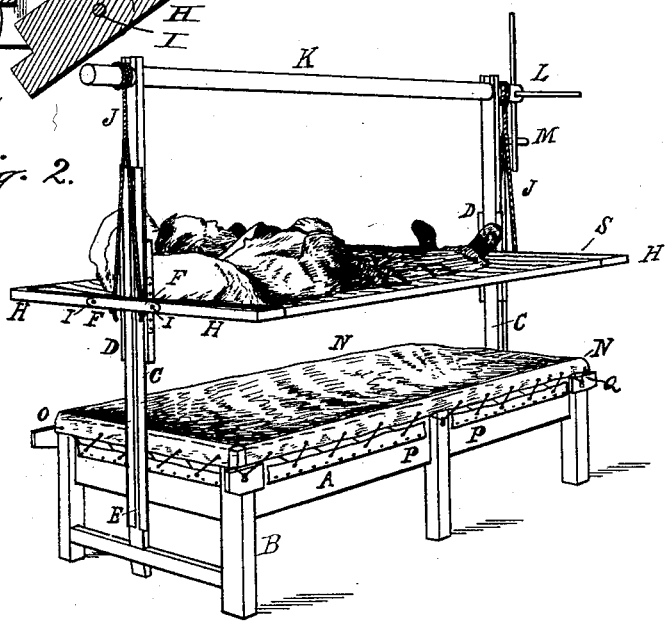


Fig. 2.



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JOSEPH T. WOODS, OF TOLEDO, OHIO.

HYDROSTATIC BED.

SPECIFICATION forming part of Letters Patent No. 489,517, dated January 10, 1893.

Application filed March 28, 1892. Serial No. 426,738. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH T. WOODS, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Hydrostatic Beds; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to beds of the class adapted to invalids' use, and the objects of my improvements are,—to provide as a mattress a suitable liquid holder, and a covering for the said liquid contents which shall be adapted to float loosely and freely thereon, which shall be adjustably and removably secured to the edges of the said liquid holder, and whose office shall be that of a flexible and yielding base sheet to protect a superimposed bed from the fluid beneath. Also to provide a superimposed bed adapted to be raised (by means of suitable appliances) above and away from said base sheet, while a patient is resting thereon, for a purpose, and in a manner hereinafter explained. I attain these objects by means of mechanism, substantially such as illustrated in the accompanying drawings, in which

Figure 1 is a perspective view of the complete apparatus having all its parts disposed in their normal positions for ordinary use. Fig. 2 is also a perspective of the complete apparatus, but having its elevating mechanism in position as it appears in use. Fig. 3 is a detail perspective view of a portion of the elevating sheet of the aforesaid bed. Fig. 4 is a persectpive detail of one pair of crossbars and its tie, showing also the end of one frame.

Similar letters refer to similar parts throughout the several views.

Referring to the drawings, A is the liquid holder which in form is a common rectangular box, or vessel, adapted to hold water or analogous fluid, and supported upon legs, B, which legs in Figs. 1 and 2, extend upward and rest against the vertical sides of the holder, A. This method of attaching the legs is a very strong and secure one and preferable on this account in many cases but for purposes of transportation, I may make the legs in the form of a detachable frame and adapted to have the liquid holder placed upon the top thereof. It is obvious that in this form of construction the said legs are more quickly detachable than in the form shown in Figs. 1 and 2.

Attached to the ends of the liquid holder A are two upright posts C. Slides D of any suitable form are adjustable vertically in suitable run-ways E on the posts C and cross bars F are rigidly secured to the slides D and adapted to be vertically adjusted with them. The cross bars are connected at the centers of their upper edges by means of a cross tie G, as seen in Fig. 6.

H is a three sided frame of which there are two in each apparatus. These frames are pivotally attached a few inches from their free ends, between the cross bars F at I and in such manner as that when the upper edges of the said frames are raised to a common plane, as shown in Fig. 2, the notches *h* at the ends of said frames H will come to rest against the under surfaces of the cross ties G when the ends of the said frames H may nearly, or operatingly contact, in an obvious manner. Cords J, attached near the ends of the frames H and between their pivotal connections I and the cross ties G, extend upward and are secured to the shaft K about which they are adapted to be wound by means of the hand wheel L for the purpose of vertically adjusting the connected frames H, or securing them in any desired elevation as shown in Fig. 2. It is obvious that when the frames H are operated upon by the cords J, to be elevated, their upper surfaces will, as hereinbefore explained, assume and remain in a common plane. When, however, the said frames are again lowered, by means of said mechanism, or otherwise, they will assume the positions shown in Fig. 1, their side bars coming to rest upon the top of the liquid holder A and their notched ends falling away from the cross-tie G, as shown. At any desired altitude the shaft K is held at rest by means of any suitable lock, (such as a pin M,) which is adapted, when placed in position as shown, to arrest the movement of the hand wheel L.

S is a bed secured to the connected frames H and adapted by means of said connected frames to be tightened when they are brought into a horizontal position, as shown in Fig. 2,

and to loosely lie upon the base sheet when the frames are in the position shown in Fig. 1, to the end that a body lying upon the said bed will be entirely supported by the fluid contents of the said holder A.

At T is an opening in the bed adapted to be left open or closed in any suitable manner, preferably by means of a piece T′, of the same material adapted to be laced or buttoned thereon in an obvious manner, as shown in Fig. 3.

At N is a base sheet made of gum or other suitable material impervious to the liquid used in the liquid holder. The requirements of this sheet are that it shall closely fit about the top of the liquid holder, loosely float upon the surface of the liquid contained in the holder A, and entirely exclude its liquid contents from a superimposed bed. The said base sheet is preferably constructed with its edges adapted to extend over the top edges, and down the vertical sides of the liquid holder or frame A, and preferably to be laced to perforated strips P by means of cord Q, through corresponding perforations, *q*, in the edges of the base sheet, N. By this arrangement of lacings, when it is desirable to have (for instance) the center of the bed tight and the ends slack, the lacings can be adjusted to permit; and this is sometimes highly desirable in invalid beds. The center of said sheet is usually slack, and therefore concave in form, while its upper edges are preferably rigid and correspond in form and size to the form and size of the top of the liquid holder A.

Having described my invention, its operation is as follows:—The holder A is filled with liquid in any convenient manner to such an extent that the base sheet will float loosely thereon, which sheet is then secured in position to the strip P by means of the cord Q. The bed S and the connected frames H are now placed in position as shown in Fig. 1. In addition to the base sheet N and the bed S, other ordinary bed clothing and pillows may be employed in the usual manner, when the patient may be placed thereon.

When it is desired to prepare the apparatus for the use of the bed pan, the bed is elevated as shown in Fig. 2, the removable piece T withdrawn, the pan placed upon the sheet N, and the patient lowered thereon, all in an obvious manner. When the base sheet N requires adjusting, removal, &c., the bed S and its contents are first raised from the said base sheet, as shown in Fig. 2. It is obvious that when the connected frames H are in position shown in Fig. 2, the said bed S will be strained tightly, as shown in said Fig. 2.

Having described my invention, I do not claim broadly the liquid holder A, with the base sheet N lying loosely thereon after the manner of a plain sheet upon a flat surface, but

What I claim as new and desire to secure by Letters Patent, is:—

1. In a hydrostatic bed, the combination with the liquid holder, a flexible base sheet over the same, and means for tightening said sheet at any desired transverse point; of the vertically adjustable bed having a flexible bottom sheet, and means for tightening said bottom sheet independently of and raising it from the base sheet, as and for the purpose set forth.

2. A vertical run-way, a slide moving therein, two crossbars secured to the slide, and a cross tie connecting the centers of the upper edges of said bars, combined with frames pivoted between the bars and having notches at their inner ends, a connection substantially as described between their outer ends, and means for raising the notched inner ends against said cross tie, all as and for the purpose set forth.

3. In combination with a liquid holder and a flexible base sheet N, of a bed S adapted to be horizontally tightened and slackened by means of frames H, pivoted cross bars F, connecting the frames, vertical guides for said cross bars, cords J, and windlass K, substantially as shown.

4. The combination with a bed support, a base sheet thereon, posts rising from the support, runways on said posts, slides moving in said ways, frames pivotally connected to the slides, and a bed carried by the frames, of a windlass journaled in said posts, and ropes leading thence down to the slides, as and for the purpose set forth.

5. A vertical run-way, a slide moving therein, two cross bars secured to the slide, and a cross tie connecting the centers of the upper edges of said bars, combined with frames pivoted near their inner ends between the ends of the bars, a connection substantially as described between their outer ends and means for raising said inner ends against said cross tie, all as and for the purpose set forth.

6. A hydrostatic bed consisting of a liquid holder and a thin flexible base sheet superimposed thereon, and means for tightening said sheet in the direction of its substantially horizontal plane and at any point desired, in combination with a bed mounted on vertical guides carried by the holder and having a single flexible bottom sheet, and means for elevating and lowering the same in said guides and for slackening it automatically when it is lowered, substantially as shown.

7. A hydrostatic bed consisting of a liquid holder and a flexible base sheet superimposed thereon, and lacings for tightening said base sheet at any desired point in the direction of its substantially horizontal plane; in combination with a bed arranged in a pivoted frame and having a flexible bottom sheet, ways supported by the holder, guides moving in said ways and carrying the frame, and means for elevating and lowering the guides so as to tighten the bottom sheet when the frame is raised and automatically loosen it when it is lowered, substantially as shown.

8. A vertical runway, a slide moving therein,

two cross bars secured to the slide, and a cross tie connecting the centers of the upper edges of said bars; combined with frames pivoted near their inner ends between the outer ends of the bars, a connection substantially as described between their outer ends, a windlass and branched cords leading from said windlass passing between said bars and astride said tie, and connected to said inner ends for raising them against the tie, all as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH T. WOODS.

Witnesses:
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