

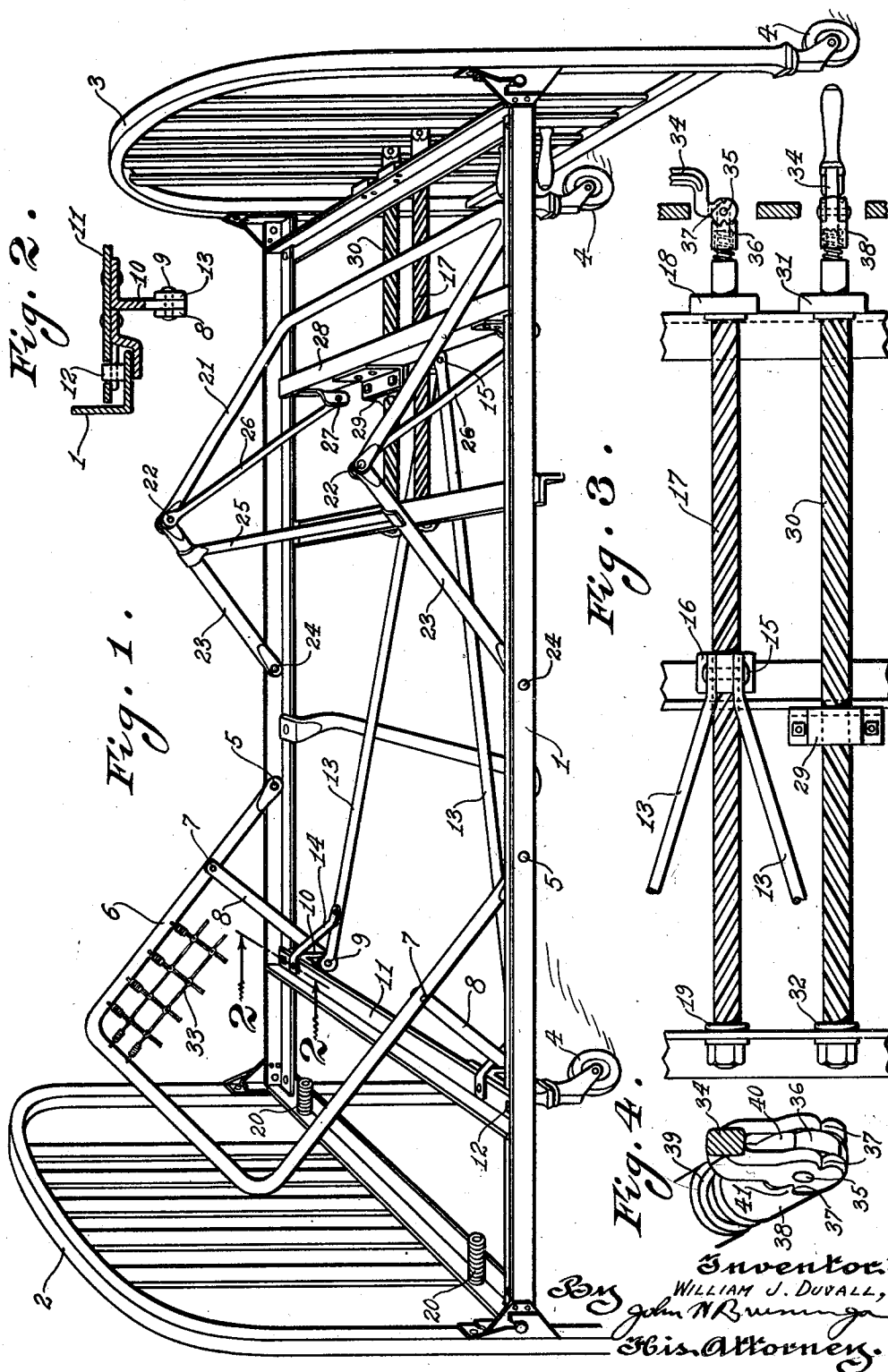
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HOSPITAL BED

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HOSPITAL BED

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This invention pertains to beds and more particularly to beds having adjustable members, such as are used in hospitals. This application is a continuation, as to its common subject matter, of application Ser. No. 691,308, filed February 7, 1924.

One of the objects of this invention is to provide a hospital bed having head and foot rests which may be raised and lowered in a simple and convenient manner.

Another object is to provide such a bed in which the manipulations for raising and lowering the rests can be carried out entirely from the foot end of the bed.

Another object is to provide such a bed of improved construction, in which the stresses incident to the raising and lowering of the rests are reduced.

Further objects will appear from the following description, taken in connection with the accompanying drawing, in which—

Figure 1 is a perspective view of a hospital bed embodying this invention;

Figure 2 is a detail section on line 2—2 of Figure 1;

Figure 3 is an enlarged detail bottom plan view of the adjusting screws; and

Figure 4 is an enlarged detail perspective view of the crank mounting.

Referring to the drawing, 1 designates a bed frame of ordinary construction, such as angle iron, and mounted in the usual manner in a head frame 2 and a foot frame 3 provided with casters 4 in the usual way. Pivoted at 5 intermediate the ends of the frame 1 is a head rest 6 having a generally U-shape spanning the frame 1 and pivoted thereto at opposite sides. Pivoted at 7 to the rest 6 is a pair of links 8. The other end of each link 8 is pivoted at 9 to a downwardly extending bracket 10 on a cross head 11 spanning the frame 1 transversely and movable therealong. As may be seen from Figure 2, the cross head 11 is provided at each end with a roller 12, which rolls upon the angle frame 1 so as to reduce friction.

A link 13 is also secured at 9 to the bracket 10 on each side of the bed. This link is further secured to the cross head by a brace 14. The brace 14 provides that thrust or pull

exerted on the cross head by the link 13 will be effective in moving said cross head along the bed frame without any tendency to tip or cant the same in either direction. The forward ends of the links 13 are secured at 15 to a block or actuator 16 threaded to receive a screw 17 mounted in bearings 18 and 19 on the frame 1. It will be seen that, by rotation of the screw 14, the block 16 may be worked forwardly or rearwardly along the frame 1. Such movement will then be transmitted through the links 13 to the cross head 11. As the cross head moves toward the foot of the bed, the links 8 will tend to raise the rest 6 on its pivots; the reverse movement will have the opposite effect. It will be noted that, in the extreme rear position of the cross head 11, the rest 6 will lie flat upon the frame 1. The links 8, however, will not be parallel thereto, since the ends connected to the bracket 10 are offset downwardly by said bracket. Accordingly, a forward pull (that is, toward the foot of the bed) on the links 13 will be transmitted through the links 8 with an upward component tending to raise the rest 6. There is no possibility, therefore, of the link 8 getting stuck on dead center.

Mounted on the head end of the frame 1 and between said head end and the cross head 11 is a pair of strong compression springs 20. As the cross head 11 moves rearwardly, it will engage the springs 20 before finally coming to rest, and its movement will be retarded and cushioned thereby. This will prevent the dropping of the rest 6 with a sudden slam at the end of its movement. The springs 20 will also tend to maintain a forward pressure on the cross head 11, tending to raise the rest 6. Since when the rest 6 is lying flat on the frame 1, the links 8 are nearly in dead center position with reference to the pivots 5, a much greater pull on the cross head will be required to start the rest 6 from this position than will be required to move said rest at a later time in its movement. The springs 20 will supply a part of the extra force required to start the rest 6 from its lying position; and, accordingly, an excessive strain on the links 13

and the screw 17 during this part of the movement will be avoided. Furthermore, an excessive effort on the part of the operator to start the rest 6 will be avoided.

- 6 A foot rest 21, U-shaped like the head rest, is pivoted at its ends 22 to a pair of arms 23, which latter are in turn pivoted at 24 to the frame 1; and a cross member 25 joining the arms 23, so as to render them rigid, may also be provided. Pivoted to the foot rest at 10 22 is a pair of links 26 connected at their lower ends at 27 with a cross head 28 sliding on the frame 1 and carrying a block or actuator 29 threaded to receive a second adjusting screw 30, mounted in bearings 31 and 15 32 in the frame 1 in a manner similar to the mounting of the screw 17. By turning the screw 30, the block 29 and, therefore, the cross head 28 may be worked back and forth 20 along the frame. During such movement, the links 26 operate to raise and lower the foot rest 21 as illustrated in Figure 1. A spring wire mesh 33 may be stretched within the rests 6 and 21 and the frame 5 in any well 25 known manner so as to provide a support for a mattress or the like.

- Each of the screws 17 and 30 is provided with a crank 34 which is pivoted at 35 to a shank 36 formed on the screw. The end of 30 the shank is flattened, as may be seen from Figure 4, and the end of the crank is forked so as to embrace the flattened end of the shank. Each prong of the fork is provided with a circular head having formed therein 35 at opposite sides notches 37. Surrounding the shank 36 is a sleeve 38 tensioned by a spring 39 also surrounding said shank. The sleeve 38 has end portions 40 extending along the shank 36 and between the prongs of the 40 fork at the forked end of the crank. The sleeve 38 is provided with lugs 41 adapted to engage in the notches 37 under tension of the spring 39 so as to secure the crank 34 in either extended or reversed position.

- 45 The screws 17 and 30 are mounted laterally adjacent one another at the foot end of the bed and are entirely independent. Each one projects slightly beyond the foot frame 3 in such a position that the crank 34, when turned 50 out to extended position, as illustrated in Figure 3, will extend beyond the foot frame so that the crank may be swung around in order to turn the screw. When not in use, however, the crank may be turned on its 55 pivot 35 to the reverse position, as shown in Figure 1, the lugs 41 engaging the other notches 37 so as to hold the crank in this position.

- 60 It will thus be seen that the invention accomplishes its objects. The arrangement of the rest 6, the links 8 and the crosshead 11 is such that there is a toggle (or rather a pair of toggles) formed by these elements, and when the backrest 6 is dropped, the toggle is 65 nearly straightened. Accordingly, a slight

movement of the crosshead along the frame will cause a considerable movement of the backrest, especially at its free end. Upon actuation of the screw 17, there is, therefore, 70 liable to be a sudden start imparted to the backrest when it is moved to raised position and a rather abrupt stoppage thereof when it is moved to dropped position. This is especially true if a screw is used which necessarily has back lash so that the initial or final 75 movements imparted to the crosshead will result in the taking up of the back lash thereby imparting a sudden jar. In accordance with this invention, however, the springs 20 bear against the crosshead when the back- 80 rest is in dropped position and, therefore, when compressed tend to move the crosshead to the right. Accordingly, when the screw 17 is turned to move the crosshead along the frame, this crosshead will be initially started 85 by these springs so that the toggle will be fully broken before the lagging faces of the screw thread come into play; accordingly, the backrest will be raised, gently rather than with a start. Moreover, upon 90 dropping of this backrest, the springs 20 will become compressed so as to yieldingly arrest the crosshead and the backrest in dropped position; accordingly, the backrest will be 95 dropped gently and without shock or jar.

It will be seen, therefore, that this invention provides a hospital bed which is convenient to handle, since both of the screws 17 and 30 are located adjacent the foot of the bed, 100 and their cranks are easily accessible for manipulation. The manipulation is easy, because the screws may be provided with threads of such a pitch that the effort required to turn the crank is as small as desired. The cross heads 28 and 11 move along 105 the frame and raise the rests by means of a toggle action of the links 26 and 8. By the movement of the cross head 11, the same is rigidly braced against the links 13 so that there is no chance of its tipping or twisting, 110 and it moves evenly and smoothly. At the end of its movement, it engages the springs 20, which cushion its final movement and at the same time tension the same so as to provide part of the effort for starting the move- 115 ment of raising the head rest. The entire apparatus is inconspicuous and practically invisible when the bed is made up.

It is obvious that various changes may be made, within the scope of the appended 120 claim, in the details of construction without departing from the spirit of this invention; it is to be understood, therefore, that this invention is not limited to the specific details 125 shown and described.

Having thus described the invention, what is claimed is:

A hospital bed comprising, a frame, a rest pivoted on said frame intermediate its ends, a crosshead guided for movement along said 130

frame, links connecting said head with said rest to form toggles with the latter, a screw extending along said frame and connected with said head to move the same back and forth along said frame, and springs between the end of said frame and the ends of said head and adapted automatically to apply a force to said head to start and arrest said head.

10 In testimony whereof I affix my signature this 11th day of June, 1927.

WILLIAM J. DUVALL.

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