July 23, 1935. E. A. RAFFO 2,008,770

ATTACHMENT FOR HOSPITAL BEDS

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Fig. 1.

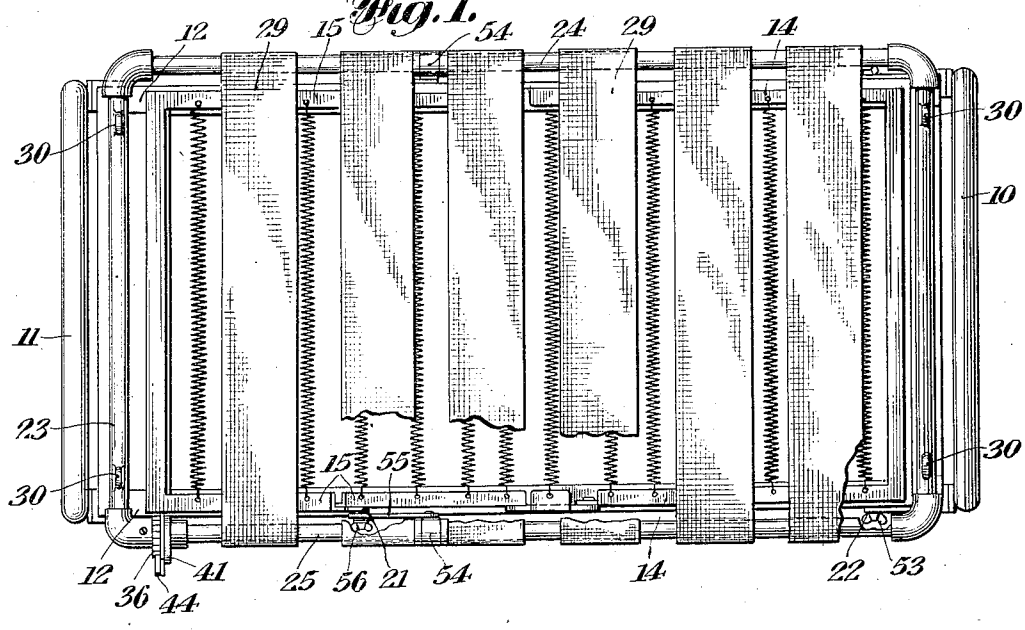
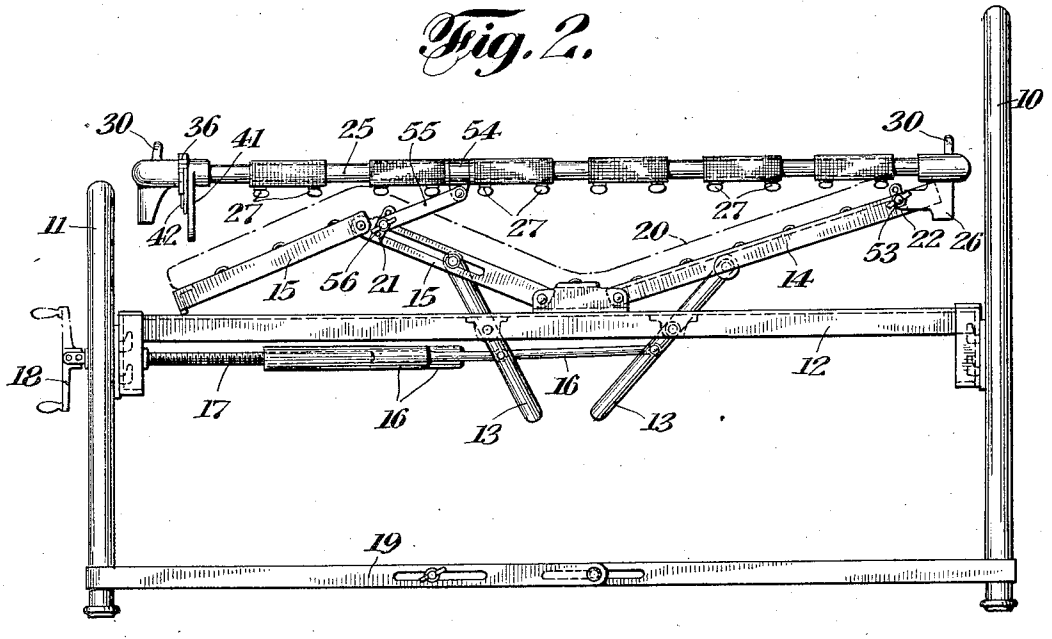


Fig. 2.



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Fig. 3.

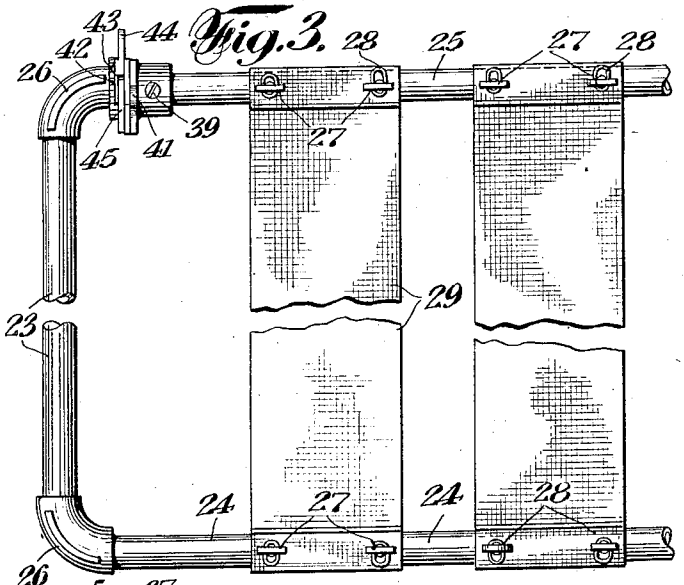
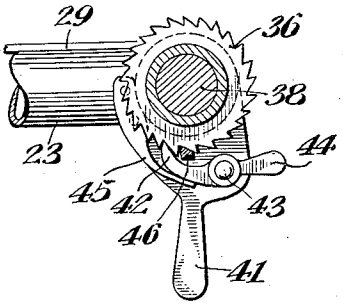


Fig. 5.



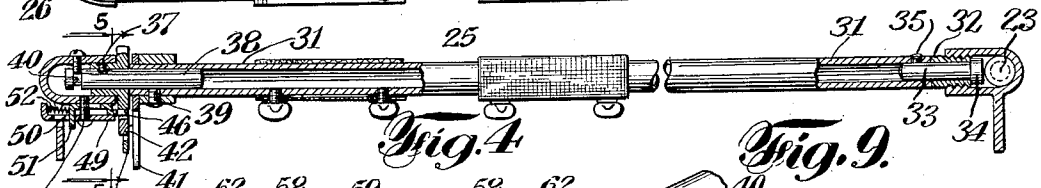


Fig. 4

Fig. 9.

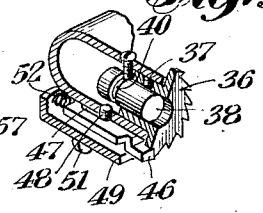


Fig. 6.

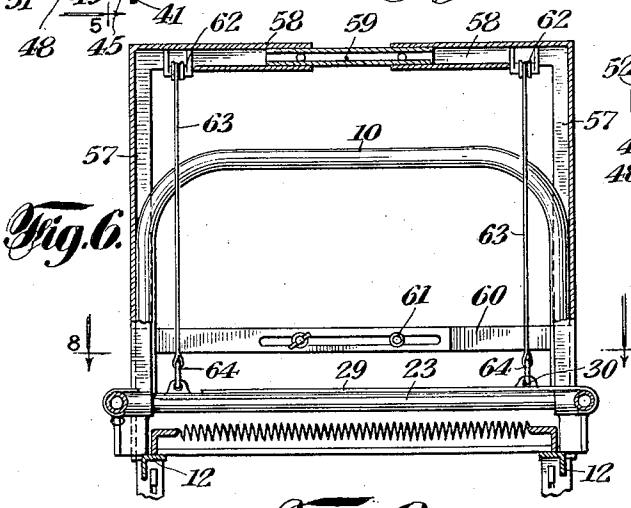
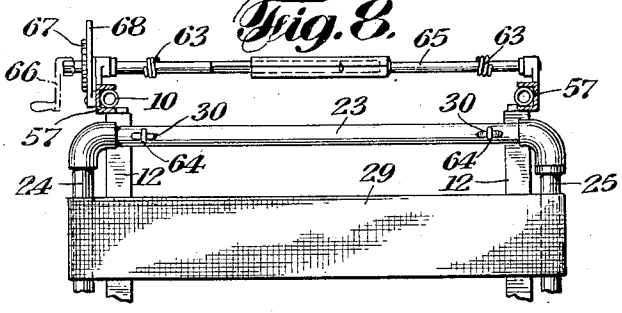


Fig. 7.

Fig. 8.



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Patented July 23, 1935 2,008,770

UNITED STATES PATENT OFFICE

2,008,770

ATTACHMENT FOR HOSPITAL BEDS

Emile A. Raffo, New York, N. Y.

Application June 1, 1932, Serial No. 614,691

1 Claim. (Cl. 5—83)

This invention relates to a patient supporting attachment which is affixed to hospital beds and more particularly to such an attachment in the form of a stretcher frame, the supporting members whereof comprise laterally spanning strips of webbing. The use of this atttachment primarily provides for maintaining the position of a patient in a relatively unchanged position with respect to the supporting attachment. Of course, the tilting necessary one way or the other in certain cases does not affect the operation and use of this device.

Among hospital equipment there is in general use two types of beds. The first type, known as an invalid bed, is provided with a spring, the frame of which is joined together at certain points to provide rectangular sections which may be raised or lowered to change the patient's position from a reclining to a sitting position or any intermediate one at the will of the operator by turning of proper members at the foot of the bed. A second type of bed is the ordinary hospital bed with the usual straight spring.

In certain cases, such as fracture cases, it is imperative that a patient's position, at least during a certain length of time, remain unchanged. Several difficulties automatically follow because of this requirement. For one thing, a malady known as bed sores can develop without there being any way of massaging and treating the affected area. Secondly, it is difficult to change the bed linen in such a case without some movement of the patient. Thirdly, if it becomes necessary to transfer such a patient, an attempt to transfer while maintaining his position unmoved is difficult and uncertain and, lastly, the use of bed pans is made difficult. These difficulties would not arise if there was some way of elevating the patient from the bed in unchanged position.

An object of this invention is to provide a patient supporting attachment for hospital beds which will permit the elevation of the patient off the bed in unmoved position and a further object of this invention is to provide a removable supporting attachment which will permit the patient to be transferred or set down anywhere without any change in his position. A still further object of this invention is to be found in the provision of such an attachment which will permit the tilting of the patient as in hemorrhage cases without any necessity of blocking up the bed or using special apparatus. Another object of this invention is the provision of an attachment which will raise the patient in unmoved position off the bed for purposes of massage, treatment, relief or change of bed linen which could not be effected without such provision.

Features of this invention are to be found in the fact that it is a patient supporting attachment, not requiring the substitution of an entirely new apparatus for the hospital bed; the supporting attachment has a rigid frame and may be utilized for all purposes as a stretcher and may be moved by any lifter; the use of the attachment does not deprive the patient of the benefit of the mattress; there is no difficulty in affixing the supporting attachments to any of the beds that are in use in hospitals; there is no sagging of the patient on the stretcher supporting attachment unless such is desired; and the cost and expense in furnishing the device of this invention is very small.

The usual embodiment of the invention comprises a rigid rectangular frame, one long side of which frame is rotatable in one direction by means of a ratcheting and web tightening arrangement to be described later. The supporting material for this supporting attachment or stretcher comprises a series of fabric webs spanning the distance between the two longitudinal sides and fastened thereto by means of studs engaging with grommets in the webbing. It will be seen that upon movement of the tightening side, the webbing is tightened and until released there will be no sag in the stretcher. Each of the corners is provided with an integral leg which is adapted to stand either upon the frame of the bed or upon the floor wherever it may be set down. In affixing this stretcher to an invalid bed, the head of the stretcher is fastened to the head portion of the sectional spring frame and the lower portion of the stretcher to the foot section of the adjustable spring. Then by manipulation of the members which raise the spring into sitting position, the stretcher is lifted away entirely from the bed, spring and mattress, the webbing having previously been tightened so that the patient's body does not sag. With the stretcher in such elevated position, it immediately becomes a simple matter to pull the whole mattress out and insert a freshly changed one or to release one of the webbing strips for treatment of bed sores or other ailments or for the use of the bed pan. When the spring is returned to its flat position, the webbing strips on the stretcher are released and the mattress and bed spring take over the duty of supporting the body. To transfer the patient from one place to another, the webbing is again tightened and the connections between the stretcher

and the bed spring are released and the patient in unmoved position on the stretcher may then be taken away.

As the ordinary hospital bed is not provided with means to elevate certain sections of the spring and to permit the use of the supporting attachment and stretcher of this invention therewith, two suspending frames are slipped over the head and foot of the bed and fastened in place, care being taken to prevent these suspending frames from scratching the bed. The effect of these frames is materially to heighten the foot and head of the bed. The stretcher which is resting on the frame of the bed above the spring is provided with supporting eyes at the top and bottom thereof. These eyes are engaged by hooks attached to cables passing over pulleys at the top of the suspending frame and in turn being connected to a lower tightening bar at the bottom of the frame which is provided with a pawl to prevent the stretcher from slipping back once it has been raised. These suspending frames are made so that their width is adjustable for various sizes of beds. On the other hand, it is usual to make a standard size stretcher for each standard size bed. The operation and advantages in the use of this stretcher are the same regardless of the type of bed it is used upon. It is also apparent that this stretcher may be tilted in one direction or the other whether it is used in conjunction with an invalid bed or an ordinary bed.

Additional objects and advantages of this invention will be apparent from the following description and the drawings, in which

Fig. 1 is a plan view of the supporting attachment or stretcher of this invention connected to an invalid bed.

Fig. 2 is a side view in elevation of the same showing the stretcher in raised position.

Fig. 3 is a bottom view of the stretcher showing the webbing attachment.

Fig. 4 is a side view and cross section of one of the long frame members in the stretcher taken through the ratchet assembly.

Fig. 5 is an enlarged view of the ratchet construction in section taken on line 5—5 of Fig. 4.

Fig. 6 is a sectional view in elevation of a suspending frame in operation connected on the end of an ordinary bed.

Fig. 7 is a side view and cross section of the same.

Fig. 8 is a plan view and section taken on line 8—8 of Fig. 6; and

Fig. 9 is a detailed sectional view of the ratchet release mechanism on the stretcher frame.

Referring to the drawings, 10 indicates the head and 11 the foot of an invalid bed. This bed is provided with the usual side rails 12 to which are pivoted two elevating yokes 13. A sectional spring is pivoted to the rails 12 about at its mid point providing a head section 14 and thigh and foot sections 15. Yokes 13 are connected by means of internally threaded sockets 16 to screws 17 which are turned by cranks 18 at the foot of the bed. Rotation of these cranks 18 rock the yokes 13 back and forth, causing the upper extensions thereof to raise and lower the head and foot sections of the bed spring, as will be seen in Fig. 2. To prevent any possibility of the bed springing, an adjustable tie member 19 is connected between the head 10 and foot 11 of the bed at the foot of the bed post thereof. The usual mattress 20 is furnished on top of the spring 14—15. To prepare this form of bed for the stretcher attachment, all that is necessary is the affixing of two clamps 21, one on either side to the thigh portion of section 15 of the spring at the lower part thereof and two similar clamps 22 to the sides of frame 14 at the upper end of that head section.

The stretcher frame is rectangular in form and of a size to fit the bed with which it is used and comprises two end members 23, a side member 24, and a movable side or tightening member 25. Integral supporting legs 26 are cast to the stretcher frame in each of the corners thereof. Usually legs 26 will stand on rails 12 of the bed when the stretcher is not in an elevated position. Side members 24 and 25 have along the bottom side thereof at spaced intervals a series of swivel headed studs 27 which engage with oval grommets 28 placed in the ends of webbing strips 29 which span the stretcher frame from one side 24 to the other side 25 thereof. By turning the heads of the studs 27, the webs are locked in position and, conversely, by turning them at right angles thereto all or any of the webbing strips 29 may be removed. Inasmuch as member 25 is a tightening member, the studs 27 will have no fixed rotational position thereon. It is also preferable to furnish end members 23 with supporting integral eyes 30 for use either in conjunction with its adaptation to an ordinary bed as will be shown later or perhaps when a patient is being removed by a lifter. In fact, when the webbing strips 29 are tightened, the patient may be moved anywhere or set on the floor without any relative change in his position.

To tighten the webbing strips 29 by the winding thereof on member 25, side member 25 is first made rotatable and yet remains a portion of the rigid frame. Thus, from Fig. 4 it can be seen that side member 25 comprises a hollow tube 31 abutting the upper end of the frame near the joint between the side member 25 and the end member 23. A flat headed pin 33 with its head 34 caught behind portion 32 of the joint of the frame extends through into tube 31 and is secured thereto by key 35. This device is used to prevent the side member 25 from pulling out from the corner of the stretcher frame.

A ratcheting gear 36 is interposed between the other end of tube 31 and the end of the stretcher frame. The hub of the gear 36 extends into the joint at this end of the frame and is keyed at 37 to pin 38 keyed at 39 to hollow tube 31 into which it extends. A reduced portion 40 at the one end of pin 38 prevents the frame from pulling apart at that end. Key 39 just referred to also keys a ratchet lever 41 to side member 25, said lever 41 carrying a ratchet pawl 42 pivoted to the lever at 43 and having a release extension 44. The pawl is kept in engagement with gear 36 by flat spring 45 fastened to the plate of lever 41. As the lever 41 is moved in the direction to tighten the webbing strips 29, a clicking dog 46 preserves the position of the side member 25. Tension in the webbing strips 29 would quickly unwind portions of the strips around member 25 if there was not provided the dog 46 which locks ratchet wheel 36 and consequently member 25 in place. The dog 46 is slotted at 47 for the passage of an assembling stud 48 which also positions a ratcheting plate 49 slotted at 50 to permit the release of dog 46 by the drawing back of projection 51. A spring 52 normally maintains dog 46 in position. Lever 41 is usually placed at the foot end of the stretcher frame as it is thereby within convenient reach of the operator of both the invalid bed and the bed with the suspending frame for the stretcher. The ratchet is required for purposes of

tightening webbing 29 as otherwise the tightening lever, such as 41, would not pass the side rail 12 of the bed.

In this embodiment shown, all of the webbing strips 29 are tightened at one time unless disengaged from the side of the stretcher frame but provision can be made to have these strips individually tightened along the length of the member 25.

At the upper end of the stretcher frame two wing bolts 53 are provided and are screwed into clamps 22, establishing a pivotal connection between the upper end of head section 14 of the spring and the stretcher frame. Just below the middle of the frame on members 24 and 25 are two collars 54 from which links 55 depend, the ends of these links being screwed by wing bolts 56 to clamps 21, establishing thereby a complete and controlled connection between the spring of an invalid bed and the stretcher frame.

To enjoy the benefits of the stretcher of this invention in connection with its use on the ordinary hospital bed, there is provided two suspending frames, one for the head 10 and one for the foot 11 of the bed, these frames comprising side channel members 57. Members 57 make a right angle turn at the top, furnishing a portion of the top of the suspending frame 58. Portions 58, however, do not meet and a slidably connecting bar 59 is used and secured to each of the portions 58 of one suspending frame. Midway of the frame are two overlapping straps 60 with registering slots through which two securing bolts 61 are fastened for strengthening purposes. The purpose of bar 59 and the straps 60 is to permit adjustability of the suspending frames to accommodate different sizes of beds. Felt or similar material is used to line sides 57 of the suspending frame so as not to scratch the head and foot of the bed and, furthermore, a tightening device of some kind must be used to establish the up and down position of the suspending frame on the end of the bed. At the inner ends of portions 58 there are provided pulleys 62 over which wire cables 63 pass, terminating at one end in a hook 64 which engages eyes 30 on the stretcher frame. Such points of support for the stretcher furnish a stable and convenient method of changing its position when needed. The other ends of cable 63 pass downwardly outside the end of the bed and are fastened to and wound around an extensible bar 65 which terminates in a square end at one side for use with a crank 66 to raise and lower the stretcher frame according to the necessities of the case. The usual gear 67 and pawl 68 to preserve the position of the stretcher are found.

When using this stretcher, the patient is placed thereon and the webbing strips 29 released so that they rest directly on the mattress and spring of the bed. If his head is to be raised, as in certain types of cases, either side section 14 is elevated, tipping the stretcher in one direction, or the suspending frame at the head of the bed is used by turning crank 66 to raise that end of the stretcher. Conversely, if the feet are to be raised, either foot section 15 on the invalid bed is elevated or the suspending frame at the foot of the bed is used. Before such tilting, however, webbing strips 29 are tightened by means of ratchet lever 41 and they remain in this tightened position until dog 46 is withdrawn.

If, on the other hand, the stretcher as a whole is to be raised above the level of the mattress, the webbing strips 29 are again tightened with the exception of any particular one in any particular locality, such as removing some at certain points for purposes of back massage or treatment or for the use of the bed pan, or similar article. The remaining strips 29 are tightened and both sections on the invalid bed and both suspending frames on the ordinary bed are operated to lift the patient in unchanged position above the surface thereof for the purposes above described or for purposes such as changing the bed linen. Furthermore, the patient may be handled on a device of this kind without fear of aggravation of injury because of his unchanged position. Thus he may be transferred from one bed to another or set down on the floor while on the stretcher frame without any inconvenience or harm. Besides the advantages accruing to the hospital attendants and patients from the use of this invention, there are the added features of saving by virtue of its being an attachment for any type of bed and furthermore one that is easy to put into operation when needed.

Mere changes in form or structure in this invention apparent to anyone skilled in the practice of said art are considered within the scope thereof and such scope is not to be limited except as may be done by the appended claim.

I claim:

In combination, an invalid bed comprising a head section and a lower section each of which may be independently raised at will, a removable stretcher attachment overlying said sections, a rigid body supporting frame comprising a major portion of the said attachment, means pivotally connecting one end of the frame with one of said sections, a link pivotally connecting the frame with the other of said sections, and means whereby said sections may be raised independently or together for the elevation of said stretcher attachment in a horizontal or in a tilted position.

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