

Nov. 17, 1959

H. L. HOLBROOK
RESTRAINING DEVICE

2,912,977

Filed Jan. 26, 1959

5 Sheets-Sheet 1

Fig. 1.

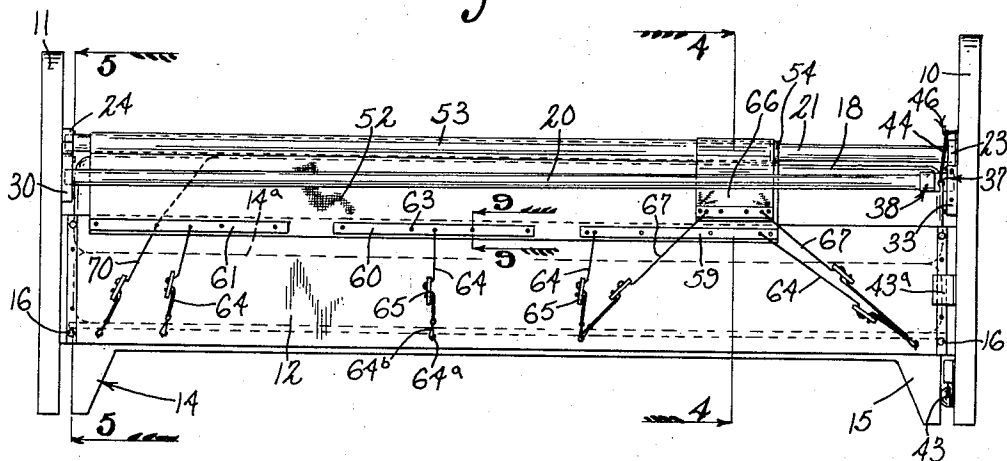


Fig. 2.

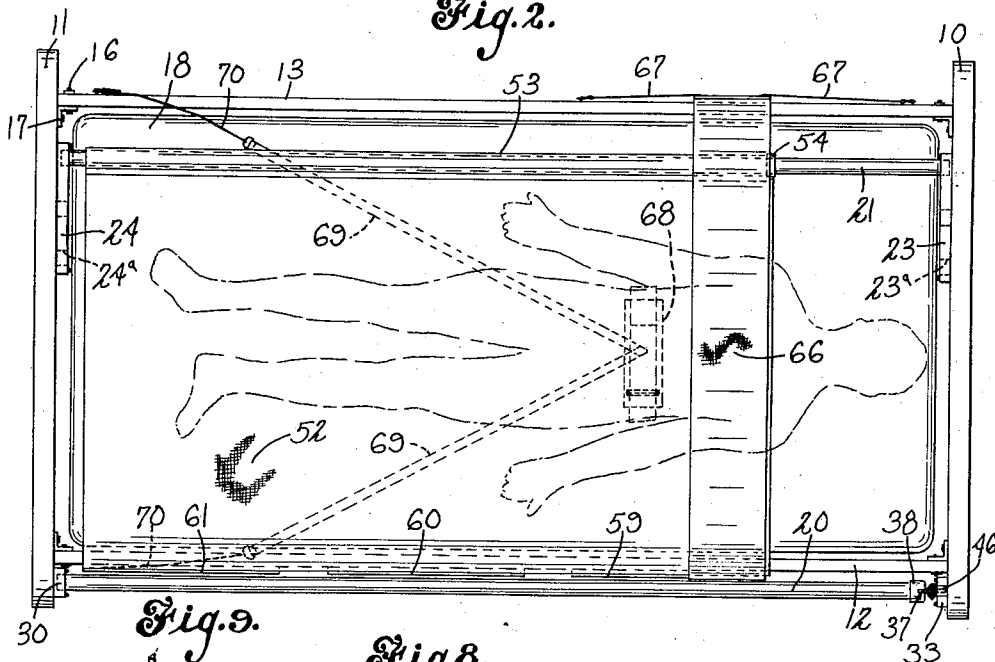


Fig. 3.

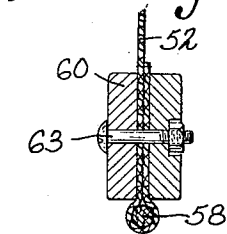
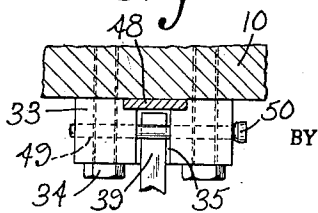


Fig. 8.



INVENTOR

Harold L. Holbrook

Rockwell & Bartholomew
ATTORNEYS

Nov. 17, 1959

H. L. HOLBROOK
RESTRAINING DEVICE

2,912,977

Filed Jan. 26, 1959

5 Sheets-Sheet 2

Fig. 3.

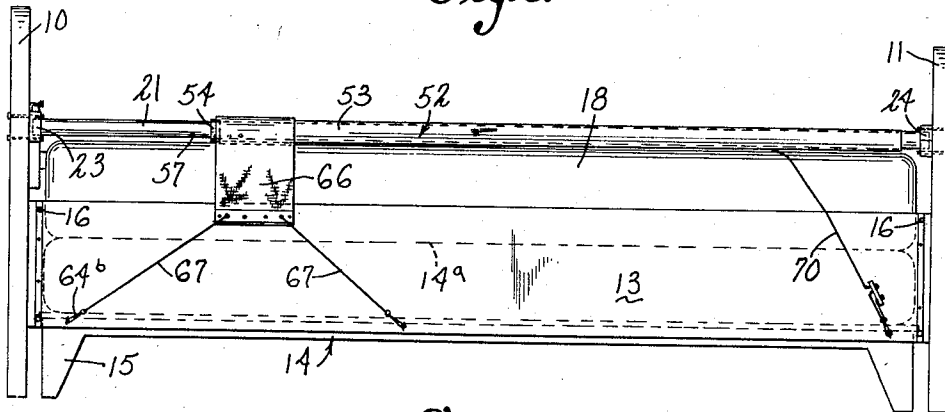


Fig. 4.

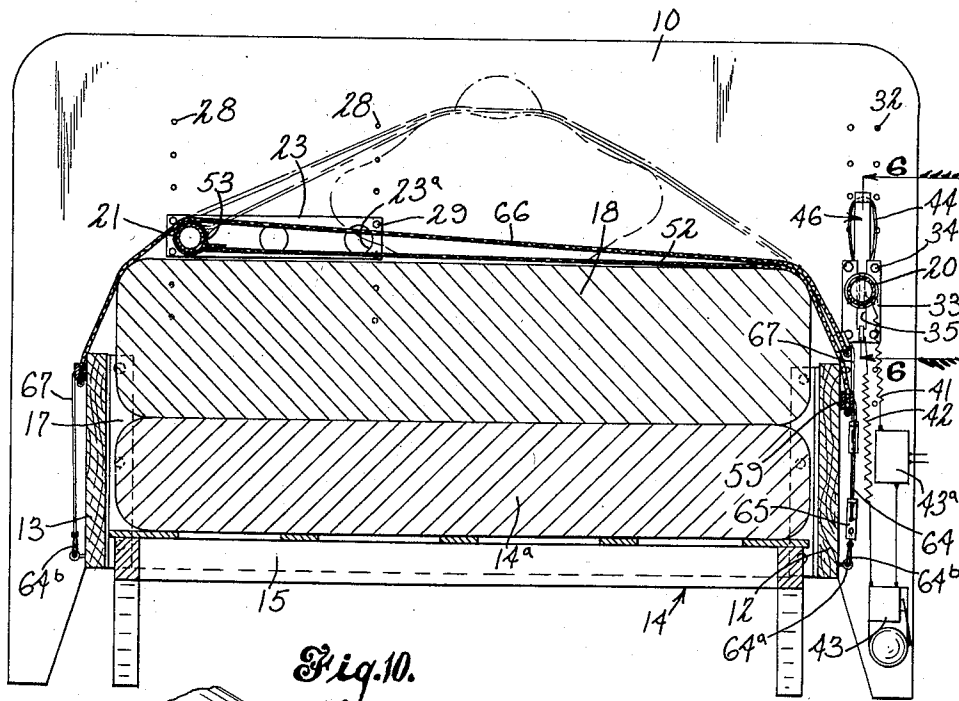
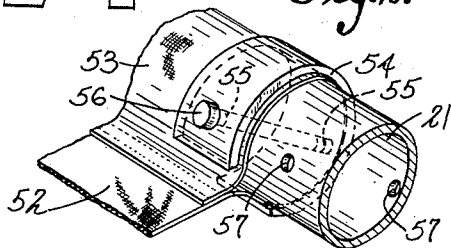


Fig. 10.



INVENTOR

Harold L. Holbrook

BY

Rockwell & Bartholomew

ATTORNEYS

Nov. 17, 1959

H. L. HOLBROOK
RESTRAINING DEVICE

2,912,977

Filed Jan. 26, 1959

5 Sheets-Sheet 3

Fig. 5.

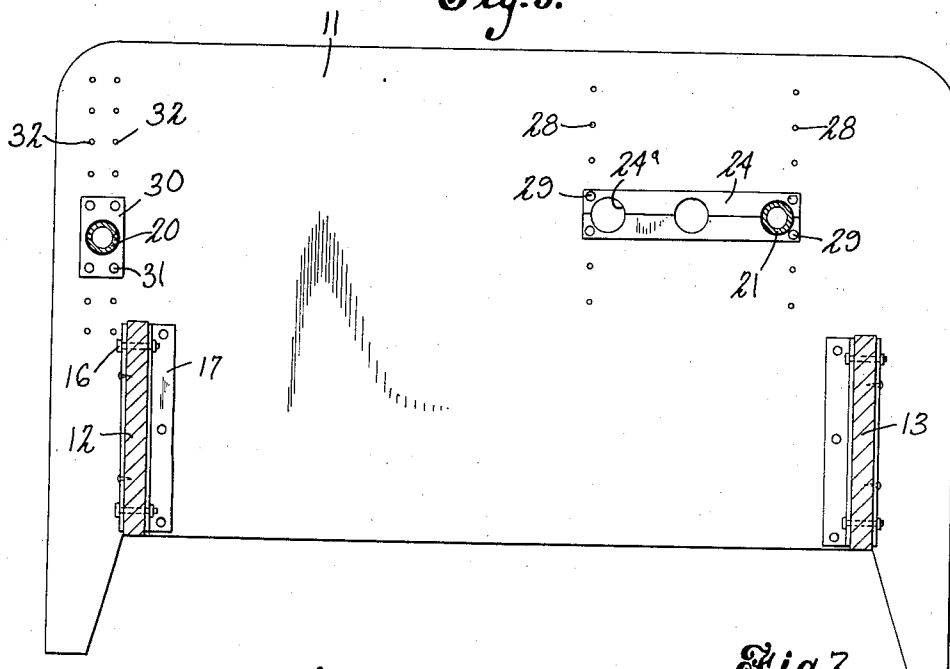


Fig. 6.

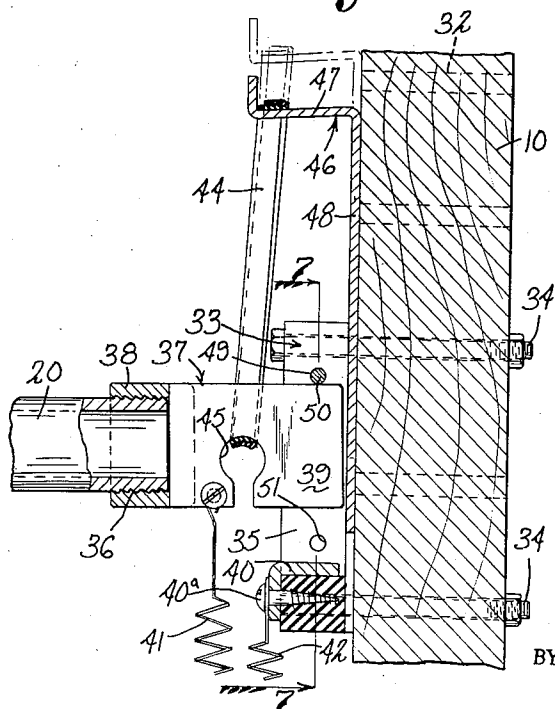
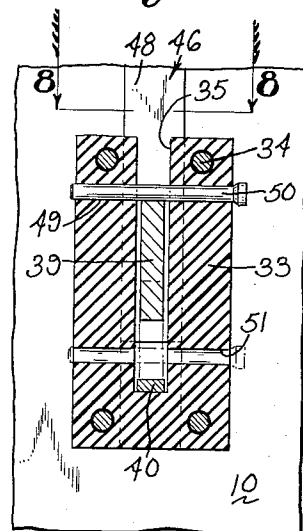


Fig. 7.



INVENTOR

Harold L. Holbrook

BY

Rockwell & Bartholomew

ATTORNEYS

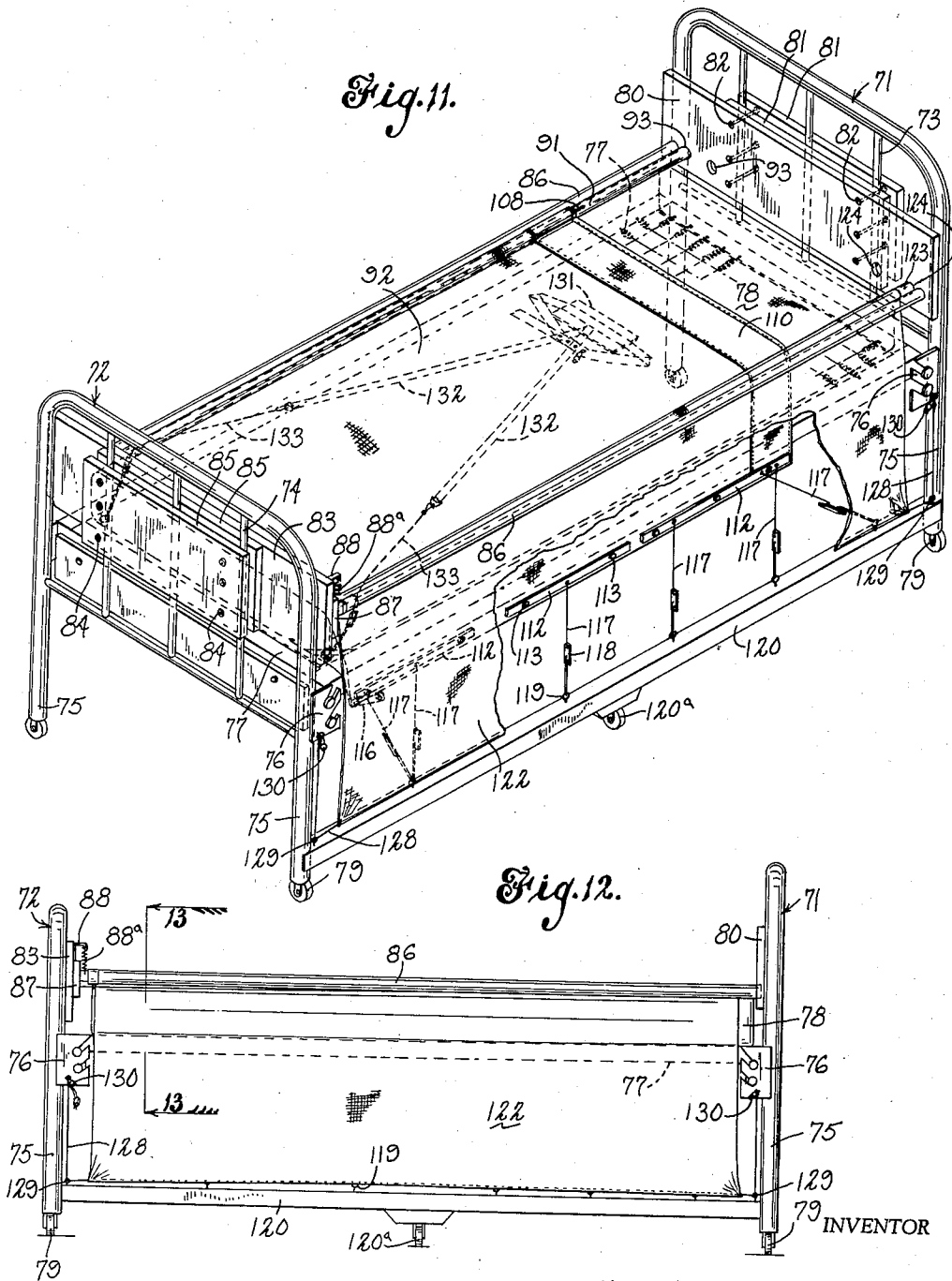
Nov. 17, 1959

H. L. HOLBROOK
RESTRAINING DEVICE

2,912,977

Filed Jan. 26, 1959

5 Sheets-Sheet 4



Harold L. Holbrook

BY Rockwell & Bartholow
ATTORNEYS

Nov. 17, 1959

H. L. HOLBROOK
RESTRAINING DEVICE

2,912,977

Filed Jan. 26, 1959

5 Sheets-Sheet 5

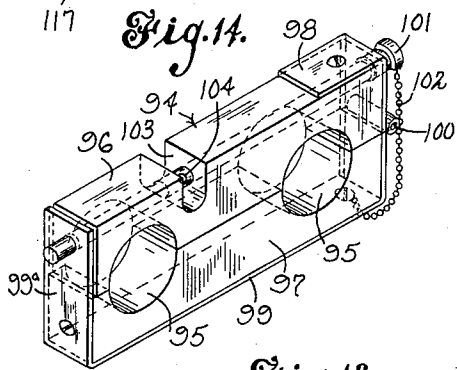
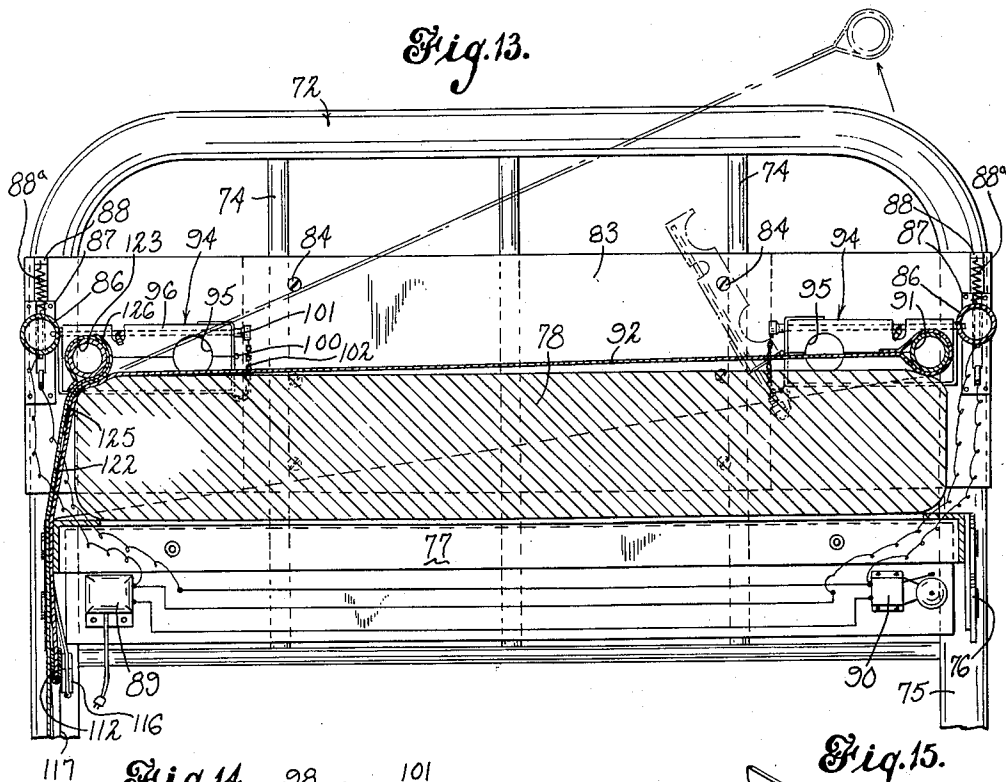


Fig. 16.

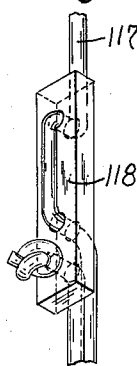


Fig. 15.

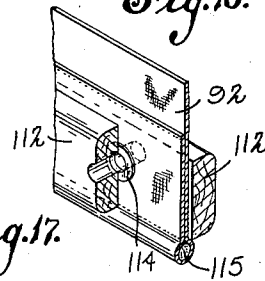


Fig. 17.

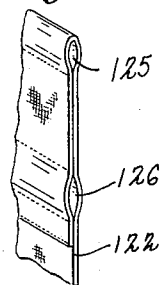
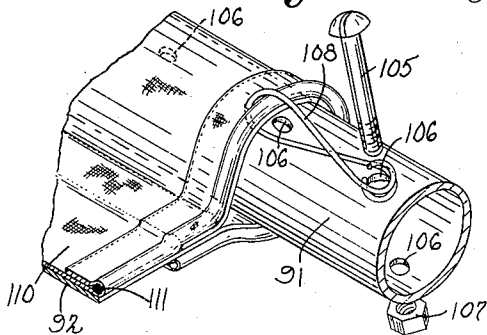


Fig. 18.



INVENTOR

Harold L. Holbrook

BY

Rockwell & Bartholow

ATTORNEYS

1

2,912,977

RESTRAINING DEVICE

Harold L. Holbrook, East Haven, Conn.

Application January 26, 1959, Serial No. 789,470

12 Claims. (Cl. 128—134)

This invention relates to a restraining device and relates more particularly to a restraining device for intractable persons. The device is employed to prevent such persons from injuring themselves or others and may be used in hospitals, other institutions, and in the home. The device may be used merely for the purpose of preventing a person from tearing off his bed and night clothing. The instant application is a continuation-in-part of a pending earlier application, Serial No. 756,356, filed August 21, 1958, and now abandoned.

One object of the invention is to provide a restraining device which, while very effectively restraining a patient, will permit a patient limited freedom and movement on a bed and which tends to restrain the patient without causing discomfort.

Another object is to provide a device of the character indicated above, which permits a variable degree of restraint.

Another object of the invention is to provide a restraining device which may be quickly secured to prevent a patient from getting out of bed, but which also permits the rapid release of the patient when this is desired by an attendant.

Still another object of the invention is to provide a restraining device which, when not secured to hold a patient down on a bed, sounds an alarm to warn an attendant if the patient attempts to get out of bed.

In the drawings:

Fig. 1 is a side elevational view of a restraining device embodying the invention;

Fig. 2 is a plan view of the device;

Fig. 3 is a side elevational view of the device showing the side thereof remote from that shown in Fig. 1;

Fig. 4 is an enlarged sectional view taken on line 4—4 of Fig. 1;

Fig. 5 is a sectional view taken on line 5—5 of Fig. 1;

Fig. 6 is an enlarged sectional view taken on line 6—6 of Fig. 4;

Fig. 7 is a sectional view taken on line 7—7 of Fig. 6;

Fig. 8 is a sectional view taken on line 8—8 of Fig. 7;

Fig. 9 is an enlarged sectional view taken on line 9—9 of Fig. 1;

Fig. 10 is an enlarged fragmentary view in perspective illustrating the restraining sheet of the device and the bar to which it is secured;

Fig. 11 is a perspective view of a restraining device of somewhat modified form;

Fig. 12 is a side elevational view of the restraining device of Fig. 11, illustrating the right-hand side of the device as viewed in Fig. 11;

Fig. 13 is an enlarged sectional view taken on line 13—13 of Fig. 12;

Fig. 14 is a further enlarged perspective view of one of the bar locks employed in the device of Fig. 11;

Fig. 15 is a fragmentary perspective view illustrating the manner in which one side edge of the restraining sheet is reinforced in the modified form;

2

Fig. 16 is a perspective view of one of the sliding blocks employed to tie down the last-mentioned side of the restraining sheet, showing the block associated with a cord;

Fig. 17 is a fragmentary perspective view illustrating certain details of a curtain employed on the modified form of the device; and

Fig. 18 is a perspective view illustrating the manner in which the restraining sheet is secured to a bar employed in the restraining device.

The restraining device is employed on a bed for a patient and may include a headboard and a footboard, or their equivalents, at the respective ends of a conventional bed. In the form illustrated in Figs. 1 through 10, the bed is constituted by a cot, that is, a mattress support having neither a headboard nor a footboard but having legs to support it on the floor between the headboard and footboard of the restraining device.

In the last-mentioned form, the headboard is indicated at 10 and the footboard at 11. The headboard and footboard are interconnected by side frames 12 and 13. The mattress support is indicated generally at 14, and includes a box spring 14^a resting on and supported from a legged structure 15. The side frames 12 and 13 are spaced above the floor, not shown, and secured at their respective ends to the headboard and the footboard, the frames being secured as by suitable bolts 16 supported by flange members 17 suitably fixed to the headboard and the footboard. As shown in Figs. 3 and 4, for example, the mattress support 14 is closely confined between the headboard and the footboard and is also closely confined between the side frames. A mattress 18 of approximately the same dimensions as the box spring 14^a rests upon the latter for support thereon. As shown in Fig. 4, the mattress 18 extends upwardly from the support 14 a distance beyond the upper edges of the side frames 12 and 13.

Bars 20 and 21 extend lengthwise of the bed between the headboard and the footboard. The bar 20 is laterally spaced from one side of the mattress and is normally approximately level with the top of the mattress 18. The bar 21 is disposed over and close to the mattress and the bed clothing, not shown, at the side or marginal portion of the mattress remote from the first-mentioned side of the mattress. To support the bar 21 and permit adjustment of the latter toward and away from the center of the bed, blocks 23 and 24 are provided on the headboard and footboard, respectively. The block 23 is provided with a plurality of laterally spaced bar-receiving sockets 23^a to permit lateral adjustment of the bar 21, and the block 24 (Fig. 5) is provided with similar sockets 24^a aligned with the sockets 23^a. The sockets 23^a and 24^a are of a diameter only slightly in excess of the diameter of the bar 21. To permit removal or adjustment of the bar 21, the block 24, for example, may be split horizontally through the centers of the sockets 24^a so that one half of the block 24, which is normally secured to the footboard by bolts 29, may be removed so that the bar 21 may be removed from the block 24 or adjusted with respect thereto. It will be understood from the foregoing that only the extreme end portions of the bar 21 are received in the blocks 23 and 24. It will also be understood that, after the bar has been removed from the blocks 24, the bar may be pulled out of the block 23. The blocks 23 and 24 are preferably vertically adjustable to adjust the bar 21 for cots of various vertical dimensions. To this end, two laterally spaced and upwardly extending series of holes 28 may be drilled in the headboard and the footboard to selectively receive the bolts 29 (Fig. 5) which secure the blocks in place. In this form, the blocks 23 and 24 are

elongated horizontally and each carries two of the bolts 29 at each end. The bar 21 may be formed entirely from a length of metal pipe constructed of an alloy which is light in weight, and the bar 20 may be formed at least in part by a section of pipe.

The bar 20 has one end thereof received in a socket formed in a block 30 (Fig. 5) attached to the footboard as by bolts 31. The footboard has two laterally spaced and upwardly extending series of holes 32 drilled therein to selectively receive the bolts 31 so that the block may be adjusted vertically. At the other end thereof the bar 20 is received in a block 33 best shown in Figs. 6 and 7 and secured to the headboard as by bolts 34. The two laterally spaced and upwardly extending series of holes 32 (Fig. 4) drilled in the headboard permit the block 33 to be adjusted vertically. The adjustability of the blocks 30 and 33 permits the bar 20 to be adjusted vertically for cots of different vertical dimensions. In effect, the bar 20 is pivoted to the block 30 attached to the footboard so that the bar may swing to a limited extent in a vertical plane.

To permit this swinging movement, the socketed block 30 receives the corresponding end of the bar 20 somewhat loosely, and the other end of the bar is received in a vertical slot or recess 35 formed in the block 33 to permit vertical floating movement of the corresponding end of the bar in the block 33. The block 33 may be formed of any suitable material which is a nonconductor of electrical current. As indicated above, the bar 20 may include a section of pipe. One end of the pipe is received in the socketed block 30 on the footboard and the other end thereof is externally threaded, as at 36 (Fig. 6). A flange member 37 having an internally threaded collar part 38 is provided on the bar 20, the collar part 38 being threaded on the threaded end of the bar. The flange member 37 has a bladelikey part 39 which extends into the vertical recess 35 (Fig. 7) in the block 33 for vertical movement in the latter. The part 39 of the flange member 37 is formed of current-conducting material and may be integral with the collar part 38. The bladelikey part 39 is adapted to make and break a circuit through engagement and disengagement with a contact member 40 disposed in the bottom of the slot or recess 35 in the block 33. The member 40 may be secured to the block 33 as by a screw 40^a (Fig. 6). Wires 41 and 42 are connected to the bladelikey part 39 and the contact member 40, respectively. These wires may form a conventional low-voltage circuit including an alarm such as a bell 43 (Fig. 4) and a transformer 43^a, and including the usual plug means for connection to a suitable electrical outlet.

The bladelikey part 39 of the flange member fixed to the bar 20 is urged upwardly or away from the contact member 40 by any suitable means. In the illustrated form from the bladelikey part 39 is urged upwardly in the slot 35 by one or more endless elastic cords 44 which extend through a recess 45 in the lower edge of the part 39. The elastic cords extend upwardly and over a generally L-shaped bracket 46, as shown in Fig. 6. As shown in the last-mentioned view, the cords 44 extend over a generally horizontally projecting arm 47 of the bracket above the block 33. The arm 47 joins an arm 48 at substantially right angles thereto. The bracket 46 is supported by a portion of the arm 48 which is sandwiched between the block 33 and the headboard. The bracket 46 may be adjusted vertically after loosening the bolts 34 which secure the block 33 to the headboard. An adjusted position of the bracket 46 is shown in broken lines in Fig. 6. To limit upward movement of the bladelikey part 39 in the recess 35, the block 33 is provided with a horizontal bore 49 extending therethrough to receive a removable pin 50. As shown in Fig. 7, the block 33 may have a lower transverse bore 51 through which the pin 50 may be extended to prevent contact of the bladelikey part 39 with the contact member 40 when this

is desired. As shown in Fig. 6, the bore 51 is spaced upwardly from the contact member 40. The purpose and operation of the alarm will appear hereinafter.

The restraining device includes an oblong restraining sheet 52 which may be formed of tough flexible material such as woven fiber. The sheet 52 may extend close to the footboard 11 and cover a patient's chest and arms, but the arms may be free if desired. The sheet 52 may be spaced from the headboard 10 to the extent indicated in Fig. 2. At one side of the bed the sheet 52 is looped over the bar 21 and securely stitched to itself to form a sleeve 53 by which the sheet 52 may be removably secured to the bar 21.

The restraining sheet 52 extends across the bed from the bar 21 and extends over the edge of the mattress at the other side of the bed. As shown in Fig. 4, the sheet 52 extends between the last-mentioned edge of the mattress and the bar 20. As viewed in Fig. 4, the right-hand edge of the restraining sheet is tied down to the side frame 12 in a manner which will appear hereinafter. To tend to prevent the restraining sheet from slipping up and down the bed, a split ring 54 embraces the upper end of the sleeve 53 and is provided with aligned or diametrically opposite holes 55 through which a pin 56 may be extended. The pin 56 extends through similar holes in the sleeve 53, and the holes 55 in the ring may register with any two of a longitudinal series of holes 57 provided in the bar 21, so that the pin 56 may extend through the bar. The series of holes in the bar 21 permits the restraining sheet to be adjusted lengthwise on the bar 21, and permits the upper side edge portion of the restraining sheet to be secured against dislocation. It will be understood that the pin 56 may be removed when it is desired to remove the sheet from the bar 21, as for cleaning purposes. When the last-mentioned bar is removed from the blocks which secure it to the headboard and footboard, the sheet may be pulled off the bar after removal of the pin 56.

To reinforce the edge of the restraining sheet which is tied down to the frame 12 as best shown in Fig. 1, the edge of the sheet may be folded over a stout cord 58 (see Fig. 9) and then stitched. Three longitudinally spaced pairs of strip members may be employed to reinforce the last-mentioned edge of the restraining sheet, these pairs being indicated at 59, 60 and 61. The strip members, which may be formed of any suitable material such as wood, may vary in number, and if desired the strip members may extend the entire length of the restraining sheet. The strip members of each pair sandwich the last-mentioned edge of the restraining sheet therebetween and are bolted together, as at 63. The cord 58, which extends below the strip members, in the manner indicated in Fig. 9, very effectively tends to prevent the sheet from pulling out from between the strip members. Of course, the strip members may be removed from the sheet when it is desired to clean the latter.

The reinforced edge of the sheet is tied down to the side frame 12 of the bed by a plurality of cords 64. As shown in Fig. 1, two of these cords are employed to tie down the upper edge portion of the restraining sheet, and each of the last-mentioned cords has an end suitably secured to the pair of strip members 59. Each of the last-mentioned cords may run through a snap hook 64^b secured to an eye bolt 64^a (Fig. 4) provided on the side frame 12, each cord forming a running loop adjustable by means of a block 65 like the block shown in Fig. 16. As shown in Fig. 1, one of the last-mentioned cords 64, the cord nearest the headboard, is inclined in a direction to prevent the upper side edge portion of the restraining sheet from being pushed downwardly toward the footboard. The other cord 64, which is secured to the pair of strip members 59, is arranged approximately vertically to prevent the corresponding side edge portion of the restraining sheet from being lifted vertically. The cords

64, which are secured to the pair 59 of strip members, are preferably spaced in the manner indicated in Fig. 1. As shown in the last-mentioned view, one cord 64 is provided to hold down the edge portion of the restraining sheet which is reinforced by the pair 60 of strip members, and another cord 64 is provided to hold down the edge portion of the sheet which is reinforced by the pair 61 of strip members. These cords also form adjustable loops and are secured to the respective strip members and the side frame 12 in the same manner as the cords 64 which are secured to the pair 59 of strip members. The cords 64 which are connected to the pairs 60 and 61 of the strip members are arranged approximately vertically to prevent the restraining sheet from being lifted.

A wide transverse strap 66, which may be made of several folds of the sheet material, is provided to overlie the upper edge portion of the restraining sheet. As shown in Fig. 4, the strap 66 extends over the bar 21 and down the corresponding side of the mattress. The strap 66 also extends over the other side of the mattress and between the side of the mattress and the bar 20. The ends of the strap 66 are reinforced like the edge of the restraining sheet which is tied down to the side frame 12. The reinforced ends of the strap 66 are tied down to the respective side frames of the bed. For this purpose, two cords 67, similar to the cords 64, are provided on each reinforced end of the strap 66, and the cords 67 are secured to the respective side frames in a manner similar to the cords 64. The cords 67 are spaced apart and are inclined in such a way as to strongly resist pulling movement up and down the bed. As indicated in Fig. 2, the strap 66 extends over the restraining sheet in the region of the patient's chest. The primary purpose of the strap 66 is to reinforce the upper edge portion of the restraining sheet. The strap 66 may be dispensed with if the upper edge of the restraining sheet is reinforced in another manner. However, the strap 66 in some cases may be employed on the bed without the restraining sheet, that is, when the restraining sheet has been removed from the bed. The strap 66 may be employed to hold down persons who need little restraint.

The restraining device includes an abdominal belt, indicated generally at 68 (Fig. 2). The belt 68 is provided with two diverging and downwardly extending straps 69 which form an acute angle with one another (see Fig. 2) and have at their respective lower ends cords 70 which are tied down to the respective side frames like the cords 64 and 67. As indicated in Figs. 1 and 2, the cords 70 extend to a point adjacent the footboard.

The use of the restraining device will be apparent from the foregoing description of its construction. The patient lies on the bed, which may be provided with the usual bed clothing, under the restraining sheet. The bar 21 to which the restraining sheet is attached may be adjusted toward or away from the center of the bed to vary the degree of confinement of the patient. It will be understood that the closer the bar 21 is to the center of the bed, the closer the patient is confined in the bed. The restraining sheet 52 and the strap 66 may be tied down firmly to the side frame 12 by an attendant. The looped cords may be adjusted by the blocks 65 to permit adjustment of the sheet 52 and the strap 66 in accordance with the size of the patient. The abdominal belt 68 is worn by the patient to prevent the patient from squirming out of the bed, that is, squirming upwardly in the bed between the restraining sheet and the mattress. The belt 68 permits the patient some freedom of movement side-wise in the bed, and also permits the patient to roll on one side or the other. Due to the fact that the bar 21 closely overlies the mattress, the patient cannot get out of the bed between the mattress and the side of the restraining sheet which is attached to the bar 21. Nor can the patient get out of bed at the other side because the corresponding edge of the restraining sheet is tied down. Of course, the footboard prevents the patient from squirm-

ing out of the bed in a downward direction. If the side of the bed remote from that shown in Fig. 1 is pushed against the wall, the other side of the bed is presented to the patient for getting in and out, and the patient climbs over the bar 20 in getting in and out of the bed. If, for some reason, the patient is not held down on the bed by the restraining sheet and the patient attempts to get out of the bed over the bar 20, the bar 20 is swung downwardly or depressed by the patient's weight and the circuit to the alarm is completed to ring the bell 43 and call an attendant. It will be understood that when the patient's weight is removed from the bar 20, the bar is returned to its normal position by the elastic cords 44, and the circuit to the bell is broken. It may be desirable to prevent the circuit to the bell from being closed. This may be done by removing the pin 50 from the bore 49 in the block 33, and inserting the pin in the bore 51. When the pin is in the bore 51, the pin provides an abutment for the blade-like part 39 of the bar 20 and prevents the part 39 from coming in contact with the contact member 40 of the bell circuit when the bar is depressed. The upward pressure exerted on the bar 20 by the elastic cords 44 may be varied by adding or subtracting from the number of cords 44 or by adjusting the bracket 46 vertically. While, in the form of Figs. 1 through 10, the mattress support 14 has neither a headboard nor a footboard, the mattress support may have both a headboard and a footboard, provided that the bars 20 and 21 can extend freely through both.

In the modified form shown in Figs. 11 through 18, the restraining device is attached to a conventional hospital bed having upright members at its ends which provide, in effect, a headboard and a footboard, indicated at 71 and 72, respectively. The headboard of the hospital bed has the usual upwardly extending laterally spaced bars 73 while the footboard has similar bars 74. The headboard and footboard, which are of metal, each have conventional legs 75 integral therewith and of tubular form. The bed includes four conventional brackets 76, two of the brackets being suitably fixed to the respective sides of the headboard and the other two being fixed to the respective sides of the footboard. The brackets 76 support a conventional flat bed spring 77 in the usual manner and the spring supports a mattress 78. It will be understood that the spring 77 rigidly interconnects the headboard and footboard. The bed may be provided with the customary casters 79 so that it may be moved easily from place to place in a hospital.

The restraining device includes a panel 80, preferably formed of wood, extending across the headboard at the face thereof nearest the footboard. The panel 80 is supported by a pair of elongate members 81 which extend transversely of the bed at opposite sides of the headboard, the arrangement being such that two or more of the bars 73 are interposed between the members 81, as shown in Fig. 11. Bolts 82 extend through the panel 80 and the members 81 to draw the panel tightly against the nearest member 81 and to draw the members 81 toward each other so that they firmly engage the bars 73 of the bed which extend therebetween. In this manner the panel 80 is, in effect, clamped to the bars 73 and it will be understood that the panel, which is of a height less than the bars 73, may be adjusted vertically on the bars after first loosening the bolts 82. A similar panel 83 is arranged in like manner on the footboard. The panel 83 is clamped to the bed by bolts 84 which extend through the panel 83 and through members 85, similar to the members 81, and disposed at opposite sides of the footboard.

In this form of the invention the restraining device includes two alarm bars 86, similar to the alarm bar 20 described above, the bars 86 being disposed at the respective sides of the bed and each having one end loosely received in a hole or recess in the panel 80 so that the other end thereof, the footboard end, may be permitted limited

7

vertical swinging movement. The last-mentioned ends of the bars 86 are received in blocks 87 (Fig. 13), similar to the blocks 33 described above, the blocks 87 being secured to the panel 83. Each block 87 is provided with a bracket 88 like the bracket 46 described above. Each bracket 88, instead of supporting one or more elastic cords, supports one end of a coil spring 88^a. The other end of the spring is connected to the corresponding bar 86 to urge the footboard end thereof upwardly. Each block 87, like the block 33, is provided with an electrical contact for engagement with the corresponding bar when the latter is depressed, and the contacts and the bars are wired in a parallel circuit (see Fig. 13) including a transformer 89 and a bell 90. The arrangement is such that, if either bar is depressed, by the weight of a patient attempting to get out of the bed at one side or the other, the circuit is closed to ring the bell 90 and thereby summon an attendant. As indicated above, the form of Figs. 1 through 10 differs in part from the form of Figs. 11 through 18 in that in the last-mentioned form the floating ends of the bars are not at the headboard end of the bed but are at the other end thereof.

The restraining device also includes a bar 91 which, as will appear hereinafter, may be lifted under certain conditions to release the patient from the bed when this is desired by an attendant. To make lifting of the bar 91 relatively easy for a female attendant, the bar may be constructed of a light, metal alloy. The bar 91, similar to the bar 21 described above, is employed to hold down one side of a restraining sheet, indicated generally at 92. One end of the bar 91 is received in either of two laterally spaced sockets 93 provided in the panel 80. The other end of the bar 91 is releasably secured in one of two blocks 94, one of the blocks 94 being shown to advantage in Fig. 14. The block 94 which secures the bar 91 is disposed on the panel 83 (see Fig. 13), providing two bar-receiving sockets 95 aligned with the respective recesses or sockets 93. The block 94, which positions the corresponding end of the bar 91 and constitutes a bar lock, is elongated transversely of the bed and is split horizontally through the centers of the sockets 95. The split sections of the block, one being indicated at 96 and the other at 97, are provided with metal straps 98 and 99, respectively, the straps being hinged together, as at 100. The block section 97 is suitably secured to the panel 83. The strap 98, which is L shaped, is suitably secured to the block section 96, while the strap 99, which is generally U-shaped and embraces the ends of the section 97, is secured to the section 97 in a conventional manner and has an extension 99^a which overlies the end of the block section 96 nearest the longitudinal median line of the bed. The arrangement is such that the section 96 may swing upwardly on the hinge 100 and toward the median line of the bed to release the corresponding end of the bar 91. To lock the bar 91 between the sections 96 and 97 a removable pin 101 is provided which may be inserted through the strap 98, the block section 96 and the strap extension 99^a, as shown in Fig. 14. The pin 101 may be secured to the strap 99 by a chain 102 of a length insufficient for removal of the pin from the block section 96 but sufficient to permit the pin to be withdrawn from the strap extension 99^a. This prevents loss of the pin. The pin may extend through a notch 103 in the section 96 and have a transverse bore 104 therein to be located in the notch when the pin is in position to secure the block sections together in fixed relation to one another. When the pin is in this position the shackle of a padlock may be extended through the bore 104 to lock the pin 101 in its operative position.

The restraining sheet 92 is similar to the sheet 52, described above, and has a side edge looped around the bar 91 and stitched to the sheet to provide a sleeve for the last-mentioned bar. Like the bar 21, the bar 91 may be easily removed from the restraining sheet. To adjust-

8

ably secure the corresponding side portion of the upper edge of the sheet to the bar 91, a bolt 105 (see Fig. 18) is provided which may be received in any one of a plurality of pairs of holes 106 in the bar 91 spaced apart longitudinally of the latter throughout a portion of its length. A nut 107 is provided to secure the bolt in the selected pair of holes and a coupling member 108 of figure-eight form is adapted to extend through the upper edge of the restraining sheet and around the bolt to fit snugly below the head of the latter to prevent patient from pushing the restraining sheet down on the bar 91.

The upper edge of the restraining sheet may be heavily reinforced to prevent tearing of the sheet by a violent patient. For this purpose a comparatively wide band 110 of material may be stitched to the upper marginal portion of the sheet and, as shown in Fig. 18, a cord 111 may further reinforce the upper edge portion of the sheet by being stitched in a fold of the band. The band 110 may be formed of the same material as the restraining sheet or, if desired, may be of heavier material. The band and the cord 111 may extend around the bar 91, as shown in the last-mentioned view. The bar 91, which is shown in the outermost socket 95 and the corresponding socket 93, may be adjusted laterally toward the center line of the bed and positioned in the other socket 95 and the corresponding socket 93, when it is desired to further restrict movement of the patient in the bed. While only two sockets 95 and two sockets 93 are shown, it will be understood that more of these sockets may be provided to increase the range of adjustment of the bar 91 if this is desired.

The side edge of the restraining sheet 92 remote from the last-mentioned side edge thereof is reinforced in a manner similar to the reinforcement of the sheet 52, described above, so that it may be tied down. For this purpose three pairs of strips 112, of wood or other suitable material, are employed. As shown in Fig. 11, the pairs of strips 112 are somewhat spaced apart along the bed and a fold (Fig. 15) of the restraining sheet is sandwiched between the strips of each pair. The strips are clamped on the folded edge of the sheet as by bolts 113 which may extend through grommets provided on the sheet to prevent tearing of the latter, one such grommet being shown in Fig. 15 and indicated at 114. To further prevent the sheet from being torn out of the reinforcing strips a cord 115 may extend longitudinally within the last-mentioned fold and below the reinforcing strips, as shown in Fig. 15. It will be understood that the strips may be removed from the sheet when it is desired to clean the latter. The sheet 92, unlike the sheet 52, has the bottom or lower edge thereof cut on the bias (Fig. 13) so that the reinforced side edge of the sheet is longer than the side edge of the sheet which is secured to the bar 91. The biased edge extends over the bottom edge of the mattress and tends to hold down the bed covers (not shown) in this region so that the patient cannot push his feet out from under the covers. The excess material of the restraining sheet may be tucked under the mattress and the double-back end portion of the last-mentioned side edge of the sheet may be reinforced by a short pair (Fig. 11) of strips 116, similar to the strips 112.

The reinforced side edge of the restraining sheet 92 is tied down by cords 117 similar to the cords 64 described above. Each cord 117 has a looped end running through a conventional block 118 (Fig. 16). The last-mentioned ends of the cords run through eye members 119 provided on a side frame member 120 forming a part of the restraining device. The side frame member 120, which may take the form of a length of angle iron, is spaced below the reinforced edge of the restraining sheet longitudinally of the latter and is supported by the corresponding legs 75 of the bed. The member 120 may have its ends welded to the last-mentioned legs adjacent the ends thereof and, as shown in Fig. 11, the

middle portion of the member may be provided with a floor-engaging caster 120^a. As shown in the last-mentioned view, the cords 117, as well as the eye members 119, are spaced apart lengthwise of the bed, and the other ends of the cords are secured to the strip members 112 and 116 in a suitable manner. The arrangement is such that the reinforced edge of the sheet may be adjustably and very securely tied down to the side frame member 120. As shown in Fig. 11, certain of the cords 117 may extend at an inclination to the reinforced edge of the sheet to effectively resist the pulling down of the corresponding side portion of the upper and lower edges of the sheet, that is, pulling of the sheet by the patient in a direction toward the foot of the bed.

For esthetic and possibly psychological reasons, a curtain 122 may be employed to hide the cords 117 which tie down the sheet 92. This may be especially desirable if the bed is used in a ward or at home. The curtain 122 is supported from a bar 123, similar to the bar 91, and having its ends arranged for support from the headboard and footboard at the side portions thereof remote from the side portions at which the bar 91 is disposed. As indicated above and shown in Fig. 11, the bars 91 and 123 are located inwardly of the respective alarm bars 86, that is, intermediate the center line of the bed and the corresponding alarm bar. As previously indicated, the restraining device includes two of the bar blocks 94, one being employed to releasably secure one end of the bar 91. The other block 94, for the bar 123, is secured to the panel 83 at the side portion thereof remote from the side portion which carries its twin. The sockets 95 of the block are aligned with sockets 124 provided in the panel 80. One end of the bar 123 is releasably secured in one of the sockets 95 of the corresponding block 94 while the other end is received in the corresponding socket 124. The last-mentioned block is arranged on the panel 83 so that the block section 96 swings inwardly toward the center line of the bed on the hinge 100 to release the bar 123 from the block. The bar 123 serves two functions. It not only supports the curtain 122, but it also is adjustable in the sockets 95 and 124 toward and away from the center line of the bed to vary the freedom of movement permitted the patient. The bar 123, like the bar 91, is closely adjacent the mattress and when both of these bars are positioned in the innermost sockets the patient is closely confined in the center of the bed. While only two sockets 95 and two sockets 124 are provided for adjustment of the bar 123 in the illustrated form, a greater number of sockets may be provided to permit a wider range of adjustment if this is desired.

As best shown in Fig. 17, the upper portion of the material which forms the curtain 122 may be folded down on itself and stitched to form two vertically spaced sleeves 125 and 126 extending horizontally throughout the length of the curtain, and the bar 123 may support the curtain by being inserted in either of the last-mentioned sleeves. As shown in Fig. 13, the bar is positioned in the sleeve 126 which, as shown in Fig. 17, is the lower sleeve. As shown in Fig. 13, the bar 123 is positioned in the outermost socket 95 and the part of the curtain which forms the upper sleeve 125 is tucked down between the restraining sheet and a portion of the curtain 122 which extends below the sleeve 126. It will be understood from the foregoing that the bar 123 may be inserted in the upper sleeve 125 when the bar is positioned in the innermost socket 95. This permits adjustment of the bar 123 without raising the lower edge of the curtain which may be tied down to the side frame member 120. The lower edge of the curtain may be hemmed and a cord 128 passed through the hem and through eye members 129 provided on the frame member 120 at the respective ends of the curtain. The ends of the cord 128 may extend upwardly from the respective eye members 129 and terminate in bound loops which may be padlocked, as at 130, to suitable fittings provided on the stationary

brackets 76 at the corresponding side of the bed. Of course, the curtain may be unlocked and raised by an attendant to permit adjustment of the cords 117 which tie down the restraining sheet, and it will be understood that the restraining sheet may be adjusted by the cords in accordance with the size of the patient. It will be further understood that the padlocked curtain tends to prevent unauthorized persons or ambulant patients in a ward from tampering with the cords 117. If the bed is used in a place where there is no danger of tampering, the padlocked cord may be removed from the curtain. It may also be noted here that there is no necessity for padlocking the pins 101 of the respective blocks 94 unless there is a danger that the pins may be tampered with by unauthorized persons or ambulant patients.

In the form of the restraining device shown in Figs. 11 through 18, the patient may be even more quickly restraint of the sheet when the release of a patient is desired by an attendant. To release the patient from the sheet the attendant pulls the pin in the block which secures the bar 91. The restraining sheet, which may be under some tension while the bar is held fast in this block, may then cause the bar to pop out of the block. This movement of the bar may effect its release from the corresponding socket 93. If this does not occur, the bar, which as previously pointed out may be very light, is easily lifted out of the socket 95 and then shifted toward the head of the bed to release the bar 91 from the socket 93. The bar and the restraining sheet may then be easily lifted in the manner shown in broken lines in Fig. 13 and subsequently placed so as to lie on the other side of the patient. The patient is then free of the restraining sheet. This manner of releasing the patient obviates the need of manipulating the cords which tie down the restraining sheet. It will be understood that the bar 123 may be released from support from the headboard and footboard in like manner. When the bar 123 and the curtain 122 are released, the bar may be easily removed from the curtain by sliding the latter off the bar. When the bars 91 and 123 are in their operative positions, they may, like the bar 21, depress the corresponding portion or portions of the mattress to effectively inhibit the pushing of an arm or leg of the patient between these bars and the mattress.

The restraining device includes an abdominal belt 131 similar to the abdominal belt 68 described above and which, if desired, may be provided with a grommated adjustment strap to receive a small padlock. The belt 131 is provided with two diverging and downwardly extending straps 132 which form an acute angle to one another (Fig. 11) and have at their respective lower ends cords 133 which are adjustably tied down to the lower corners of the bed spring.

In accordance with the foregoing disclosure, there is provided a very effective device for restraining intractable persons. One advantage of the device is that it permits a patient limited movement on a bed, and tends to restrain the patient without causing discomfort. Another advantage of the restraining device is that it permits a variable degree of restraint. The device may be quickly secured to restrain a patient and may be quickly released, when this is desired by an attendant. Still another feature of the device is that it includes an alarm to warn an attendant if a patient who is not secured in the bed attempts to leave the bed.

From the foregoing, it will be obvious that a headboard and a footboard may constitute parts of the restraining device and be employed with a bed either having or not having a headboard and a footboard, as in the form of Figs. 1 through 10. It will also be obvious that the restraining device does not necessarily include a headboard and a footboard and that the bars of the restraining device may be supported by adjustable panels on the headboard and the footboard of a conventional bed, as in the form of Figs. 11 through 18. It may also be noted that the bars may be supported from wooden boards,

or the like, of a conventional bed, without the panels. In like manner, the side frame member to which the restraining sheet is tied may be constituted by an element of the restraining device or may be constituted by a side frame member of a conventional bed.

While two forms of the restraining device have been illustrated in the drawings and described above, it will be apparent that the restraining device may take other forms and is susceptible of various changes in details without departing from the principles of the invention and the scope of the claims.

What I claim is:

1. In a restraining device for use with a bed mattress and a bed spring, a headboard, a footboard, a side frame member extending between the headboard and the footboard at one side of the mattress, a bar having its ends supported from the headboard and the footboard respectively and closely overlying the mattress at the side edge portion thereof remote from the first-mentioned side of the mattress, a restraining sheet to cover a patient's chest and extend over at least a portion of the patient's legs, the sheet having one side edge thereof secured to the bar and having the remote side edge at the first-mentioned side of the mattress, said sheet having means thereon to secure the last-mentioned edge to said member, and an alarm mechanism to warn an attendant if an unsecured patient leaves the mattress from the first-mentioned side thereof, said mechanism comprising a vertically depressible alarm-actuating bar extending the length of the mattress at the first-mentioned side thereof, which is depressed by the patient's weight as the patient leaves the first-mentioned side of the mattress, the last-mentioned bar being spring urged in an upward direction and having its ends supported from the headboard and footboard respectively.

2. A restraining device as defined in claim 1, wherein the bar to which the restraining sheet is secured is supported from the headboard and the footboard to enable the bar to be adjusted toward and away from the center of the mattress and thereby vary the degree of confinement of the patient.

3. A restraining device as defined in claim 2, wherein the bars are supported from the headboard and footboard for vertical adjustment of the bars.

4. A restraining device as defined in claim 3, wherein the sheet is secured to the first-mentioned bar by a sleeve part of the sheet which embraces the bar.

5. A restraining device as defined in claim 4, wherein the sheet is secured to the side frame by a plurality of elongate flexible members spaced apart along at least a major part of the length of the sheet.

6. In a bed structure for an intractable person, a headboard, a footboard, side frame members extending between the headboard and the footboard, a bed spring, a mattress on the bed spring, a bar having its ends supported from the headboard and footboard respectively and closely overlying the mattress at one edge portion thereof, a restraining sheet to cover a patient's chest and extend over at least a portion of the patient's legs, the sheet having one side edge thereof secured to the bar and having the remote side edge at the other side of the bed, said remote edge having means thereon to secure the edge to the corresponding side frame member, and an alarm mechanism to warn an attendant if an unsecured patient leaves the bed from the last-mentioned side thereof, said mechanism comprising a vertically depressible alarm-actuating bar extending the length of the mattress at the side thereof at which the sheet is secured to the side frame member, which is depressed by the patient's weight as the patient leaves the last-mentioned side of the bed, the last-mentioned bar being spring urged in an upward direction and having its ends supported from the headboard and footboard respectively.

7. In a bed structure for an intractable person, a headboard, a footboard, side frame members extending be-

tween the headboard and the footboard, a bed spring, a mattress on the bed spring, a bar having its ends supported from the headboard and footboard respectively and closely overlying the mattress at one edge portion thereof, a restraining sheet to cover a patient's chest and extend over at least a portion of the patient's legs, the sheet having one side edge thereof secured to the bar and having the remote side edge at the other side of the bed, said remote edge having means thereon to secure the edge to the corresponding side frame member, a transverse strap to reinforce the upper edge of the restraining sheet and overlying the upper marginal portion thereof, the strap having means at its ends for securing the strap to the respective side frame members, and an alarm mechanism to warn an attendant if an unsecured patient leaves the bed from the last-mentioned side thereof, said mechanism comprising a vertically depressible alarm-actuating bar extending the length of the mattress at the side thereof at which the sheet is secured to the side frame member, which is depressed by the patient's weight as the patient leaves the last-mentioned side of the bed, the last-mentioned bar being spring urged in an upward direction and having its ends supported from the headboard and footboard respectively.

8. In a restraining device for a bed having a headboard, a footboard, a bed spring supported from the headboard and footboard, and a mattress on the spring, the combination of a bar extending lengthwise of the mattress and closely overlying one side portion thereof, means on both the headboard and the footboard for rigidly supporting the respective ends of the bar, a restraining sheet to cover a patient's chest and extend over at least a portion of the patient's legs, the sheet having one side edge thereof secured to the bar and having the remote side edge at the other side of the bed, a side frame member at said side of the bed at a level below the mattress and supported from the headboard and the footboard, said remote edge of the sheet having means thereon to secure the edge to the side frame member, and an alarm mechanism to warn an attendant if an unsecured patient leaves the bed from the last-mentioned side thereof, said mechanism comprising a vertically depressible alarm-actuating bar extending the length of the mattress at the side thereof at which the sheet is secured to the side frame member, which is depressed by the patient's weight as the patient leaves the last-mentioned side of the bed, the last-mentioned bar being spring urged in an upward direction and having its ends supported by said means on the headboard and footboard.

9. A restraining device as defined in claim 8, wherein the first-mentioned bar is supported from said means for adjustment toward and away from the center of the bed to vary the confinement of the patient in the bed.

10. A restraining device as defined in claim 9, wherein the alarm mechanism includes a second alarm-actuating bar at the opposite side of the bed from the first-mentioned alarm-actuating bar, the second bar having its ends supported by said means on the headboard and footboard.

11. In a restraining device for a bed having a headboard, a footboard, a bed spring supported from the headboard and footboard, and a mattress on the spring, the combination of a first bar extending lengthwise of the mattress and closely overlying one side edge portion thereof, a second bar extending lengthwise of the mattress and closely overlying the other side edge portion thereof, means on both the headboard and the footboard for rigidly supporting the respective ends of the bars, a restraining sheet to cover a portion of a patient's body, the sheet having one side edge thereof secured to the first bar and having the remote side edge at the other side of the bed, the sheet extending under the second bar, a side frame member at said side of the bed at a level spaced below the mattress and supported from the head-

13

board and the footboard, said remote edge of the sheet having a plurality of elongate flexible members secured thereto at spaced intervals and securing the last-mentioned edge of the sheet to the side frame member, a curtain supported from the second bar to extend over the sheet-securing members, the first and second bars being adjustable toward and away from each other to vary the confinement of the patient in the bed, the first bar having a quick releasable connection to the said means on the headboard and the footboard to permit release of the patient from the sheet, and an alarm mechanism to warn an attendant if an unsecured patient leaves the bed from either side thereof, said mechanism comprising vertically depressible alarm-actuating bars at the respective sides of the bed, either of which may be depressed by the patient's weight as the patient leaves the corresponding side of the bed, the last-mentioned bars being spring urged in an upward direction and having their respective ends supported from said means on the headboard and footboard.

12. In a restraining device for a bed having a headboard, a footboard, a bed spring supported from the headboard and footboard, and a mattress on the spring, the combination of a first bar extending lengthwise of the mattress and closely overlying one side edge portion thereof, a second bar extending lengthwise of the mattress and closely overlying the other side edge portion

14

thereof, means on both the headboard and the footboard for rigidly supporting the respective ends of the bars, a restraining sheet to cover a portion of a patient's body, the sheet having one side edge thereof secured to the first bar and having the remote side edge at the other side of the bed, the sheet extending under the second bar, a side frame member at said side of the bed at a level spaced below the mattress and supported from the headboard and the footboard, said remote edge of the sheet having a plurality of elongate flexible members secured thereto at spaced intervals and securing the last-mentioned edge of the sheet to the side frame member, and a curtain supported from the second bar to extend over the sheet-securing members, the first and second bars being adjustable toward and away from each other to vary the confinement of the patient in the bed, the first bar having a quick releasable connection to said means on the headboard and the footboard to permit release of the patient from the sheet.

References Cited in the file of this patent

UNITED STATES PATENTS

648,621	Hooper	May 1, 1900
2,102,281	Pringle	Dec. 14, 1937
2,284,448	Reinholz	May 26, 1942
2,784,395	Gorby	Mar. 5, 1957