Dec. 29, 1931. W. A. MATHESON ET AL 1,838,561

BED CONSTRUCTION

Filed Dec. 12, 1927 4 Sheets-Sheet 1

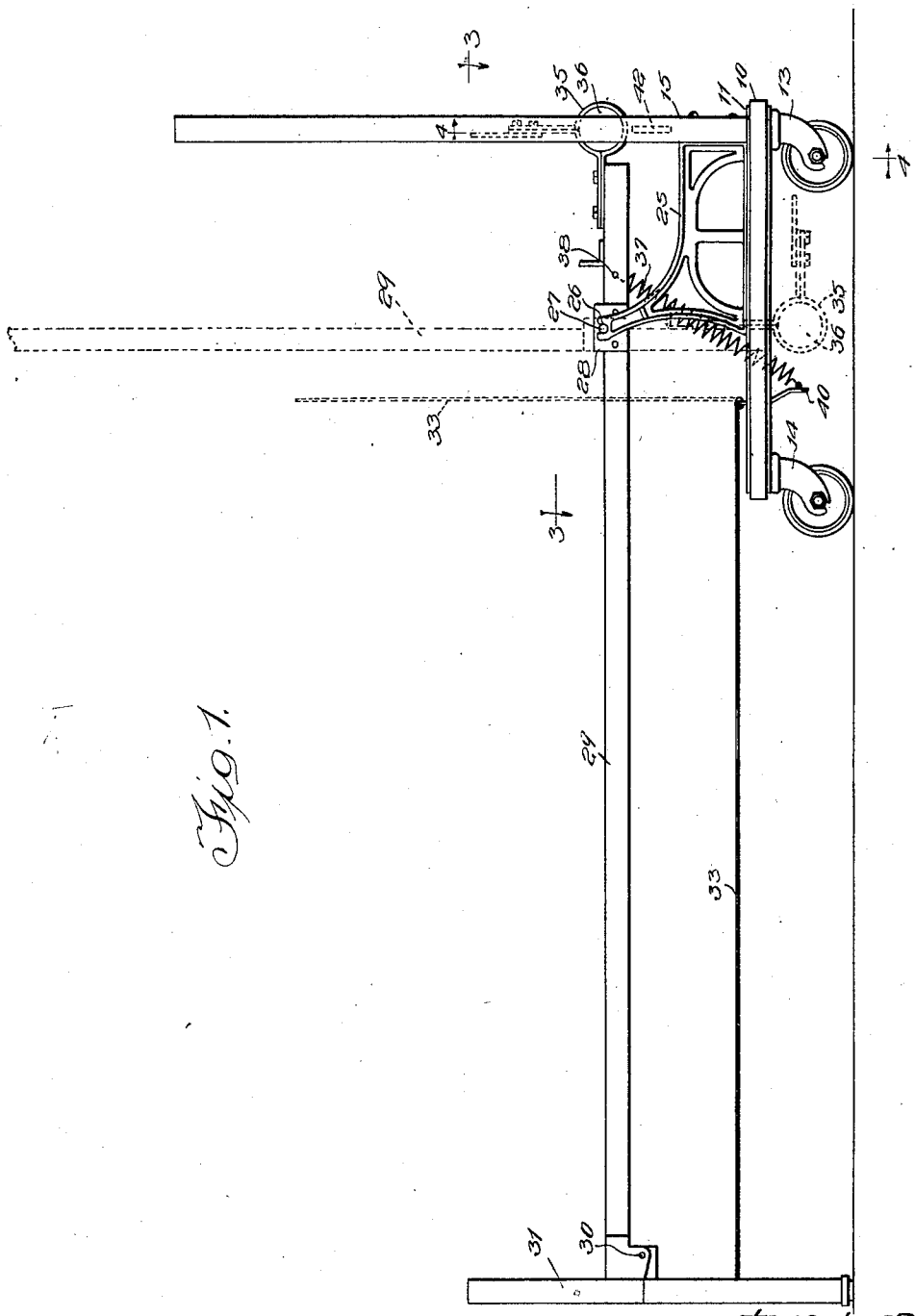


Fig. 1.

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BED CONSTRUCTION

Filed Dec. 12, 1927 4 Sheets-Sheet 2

Fig. 2.

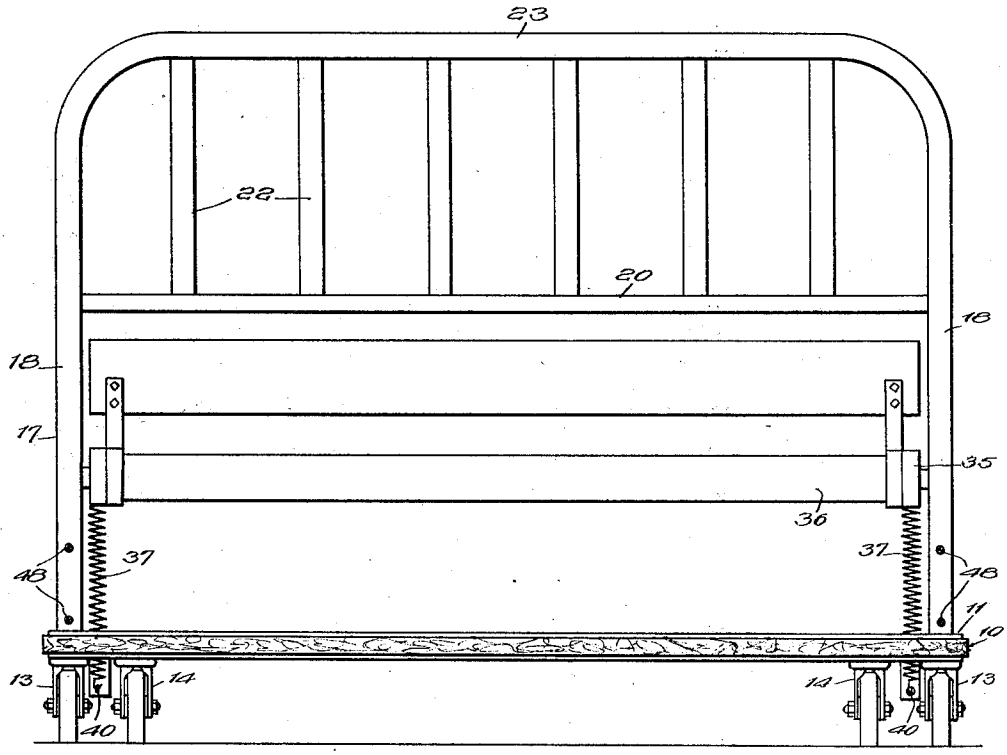
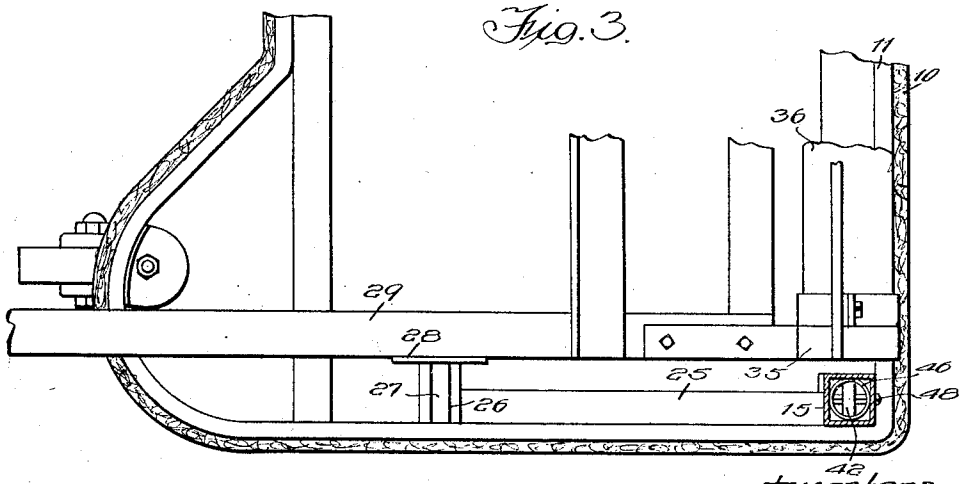


Fig. 3.



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BED CONSTRUCTION

Filed Dec. 12, 1927 4 Sheets-Sheet 3

Fig. 4.

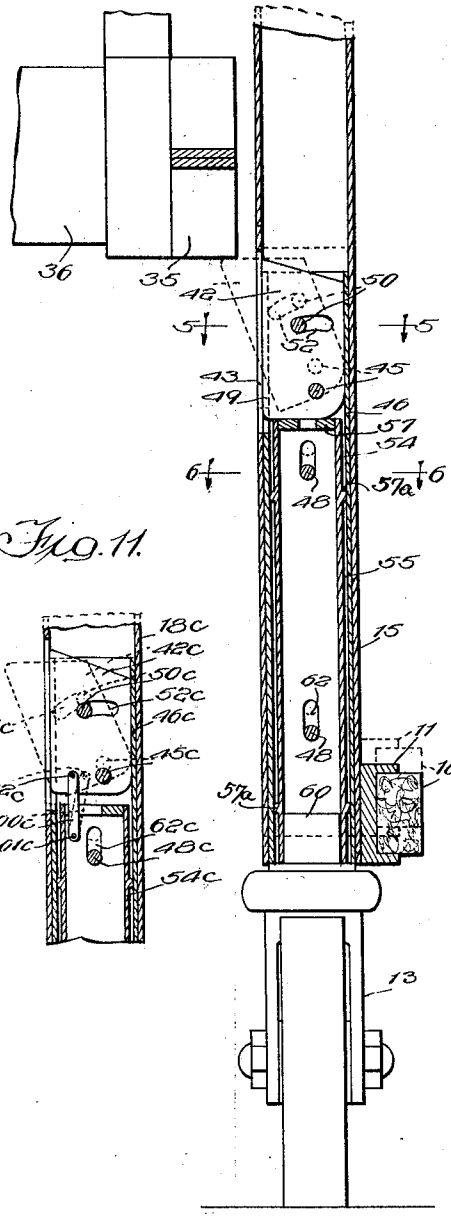


Fig. 5.

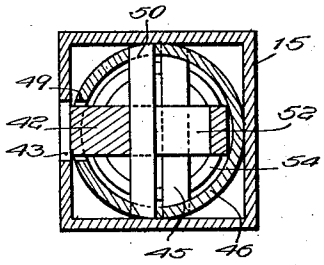
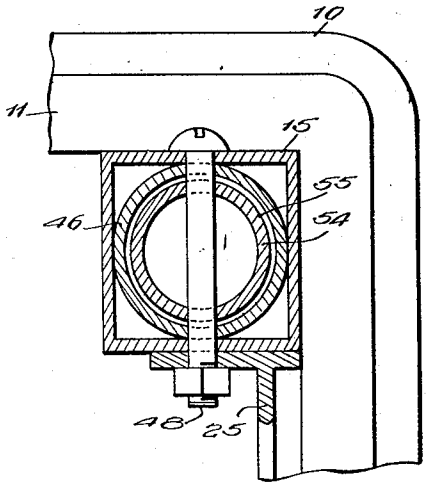


Fig. 11.

Fig. 6.



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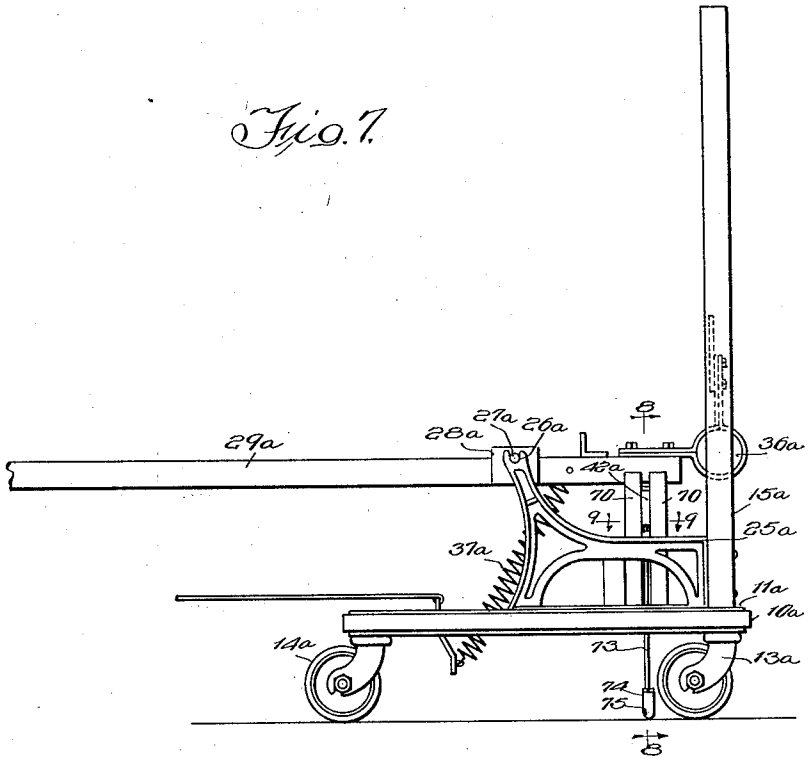
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Dec. 29, 1931. W. A. MATHESON ET AL 1,838,561

BED CONSTRUCTION

Filed Dec. 12, 1927 4 Sheets-Sheet 4

Fig. 7.



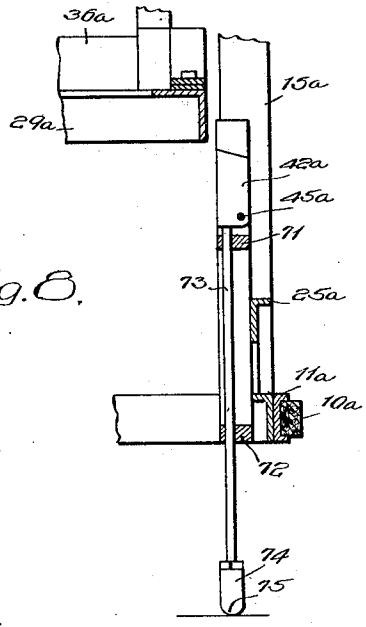


Fig. 8.

Fig. 9.

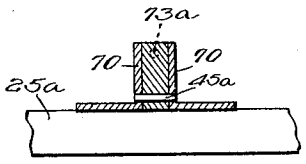
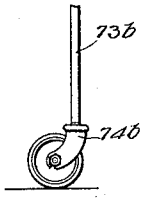


Fig. 10.



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Patented Dec. 29, 1931 1,838,561

UNITED STATES PATENT OFFICE

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BED CONSTRUCTION

Application filed December 12, 1927. Serial No. 239,478.

Our invention relates to bed construction and more particularly to the construction of beds which may be folded or collapsed.

A particular object of our invention is to provide improved devices of the kind described that can not fold, collapse, or jack-knife accidentally.

One form of the invention is embodied in a bed comprising a wheeled truck upon which the side rails of the bed are pivoted, a foot frame being pivotally secured to the side rails. The head frame of the bed is preferably rigidly secured to the truck and the side rails and the foot frame are counterbalanced by a weight and a plurality of springs. In this embodiment of the invention, the springs tend to jack-knife the bed or to tip the truck toward the foot frame when the foot frame is in its functionally operative position. To prevent such tipping of the truck, we provide a plurality of latch members which are mounted in the head frame and are so arranged that when the truck tends to tilt toward the foot frame, the latch members engage the weight and prevent displacement of the truck relative to the side rails. However, the latch members are normally in functionally inoperative positions and do not prevent the side rails and the foot frame from being folded into functionally inoperative positions.

Another embodiment of the invention is embodied in a bed which is similar in construction to the bed described above but in this instance, the latch members are adapted to engage the side rails instead of the weight and are normally held in inoperative positions by slidably journaled plungers which normally engage the floor upon which the bed is supported.

In another embodiment of the invention, we provide a bed which is similar in construction to the bed described above. To prevent jack-knifing of the bed, latch members engageable with the side rails of the bed are normally held in functionally inoperative positions by plungers which are provided at their lower ends with casters, or the equivalent, adapted to ride upon the floor.

Many other objects and advantages of the construction herein shown and described will be obvious to those skilled in the art from the disclosure herein given.

To this end our invention consists in the novel construction, arrangement and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the drawings, wherein like reference characters indicate like or corresponding parts:

Fig. 1 is a side elevation of a bed which embodies the invention;

Fig. 2 is a rear elevation of the improved bed;

Fig. 3 is an enlarged section taken on line 3—3 of Fig. 1;

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

Fig. 5 is an enlarged section taken on line 5—5 of Fig. 4;

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

Fig. 7 is a fragmentary side elevation of a bed which embodies another form of the invention;

Fig. 8 is an enlarged section taken on line 8—8 of Fig. 7;

Fig. 9 is an enlarged section taken on line 9—9 of Fig. 7;

Fig. 10 is a fragmentary elevation of a plunger adapted to be employed in place of the plungers shown in Figs. 7 and 8; and

Fig. 11 is a section taken through a portion of apparatus which embodies still another form of the invention.

Referring for the present to Figs. 1 to 6, inclusive, wherein we have shown a preferred form of the invention embodied in a collapsible or folding bed, the reference character 10 designates generally a supporting frame or truck which preferably comprises a pressed steel frame 11 supported upon a plurality of casters which are preferably swiveled in the frame 11. In this embodiment of the invention, we preferably provide two casters 13 at the rear end of the frame 11 and two casters 14 at the front end of this frame, the casters 13 and 14 being preferably substantially identical in construction. Carried by the frame

11 at the rear end thereof is a head frame 15 which preferably comprises an inverted U-shaped tubular member 17 which has its ends rigidly secured to the frame 11 by any suitable means. As best shown in Fig. 2, the tubular member 17 provides two substantially vertical hollow head posts 18 whose longitudinal axes are perferably coincident with the vertical axes around which the casters 13 are arranged to swivel. It will be readily apparent as this description progresses that we are not limited to a head frame of the kind described in Figs. 1 to 6, inclusive, but that head frames of any suitable construction may be employed and if so desired, may be dispensed with entirely. However, in this instance, the head frame 15 comprises a substantially horizontal bar 20 extending between and rigidly secured to the hollow post 18 and a plurality of relatively short vertical posts 22 extend between the bar 20 and a substantially horizontal portion 23 forming part of the tubular member 17.

Carried by the frame 11 and rigidly secured thereto are two brackets 25, each of the brackets 25 being preferably formed with a socket 26, or the equivalent, in which a trunnion 27 is pivoted. The trunnions 27 are preferably formed integral with plates 28, or the equivalent, which are rigidly secured to side rails 29 forming part of the improved bed. It will be noted that the trunnions 27 are positioned intermediate the foot and head ends of the side rails 29 and that they are positioned much closer to the head ends of the side rails than they are to the foot ends thereof. Pivoted to the foot ends of the side rails 29 by means comprising pins 30, or the equivalent, is a foot frame 31 adapted to rest upon the floor to support the foot end of the bed when the bed is in its functionally operative position. Means comprising a link 33 is preferably provided for bringing the foot frame 31 into a folded position with respect to the side rails 29 when the side rails are swung into the positions wherein they are shown in dotted lines in Fig. 1. It may be mentioned that the details of construction of the side rails 29, the foot frame 31 and the means for bringing the foot frame into a folded position with respect to the side rails 29 are not part of this invention.

Secured to the head ends of the side rails 29 by bent straps 35, or the equivalent, is a weight 36 which cooperates with a plurality of tension springs 37 to counter-balance the foot frame 31 and those portions of the side rails 29 which are disposed to the left of the trunnions 27 in Fig. 1. One end of each spring 37 is preferably secured to one of the side rails 29 by a pin 38, or the equivalent, and the other end of the spring is preferably secured to a bracket 40 which is rigidly secured to the frame 11. It will be noted that the pins 38 are disposed to the right of the trunnions 27 in Fig. 1 and that the springs 37 tend to angularly displace the side rails 29 in a clockwise direction (Fig. 1) to bring the side rails 29 into the positions wherein they are shown in dotted lines in Fig. 1. It will also be noted that the springs 37 tend to rotate the truck 10 as a unit around the trunnions 27 so as to jack-knife the bed. Heretofore, this has been a serious fault in beds of this type.

To prevent jack-knifing of the bed when the truck 10 tips toward the foot frame 31 and the posts 18 are lifted out of their normal positions, we preferably provide a plurality of latch members 42 in the posts 18. Figs. 4, 5 and 6 are sections through one of these posts and if these figures are inspected, it will be noted that each latch member 42 normally occupies a position wherein it does not project from the post although each post is slotted as at 43 so that the associated latch member 42 may swing into a position such as that illustrated in dotted lines in Fig. 4. When a latch member 42 is in a position corresponding to the dotted line position shown in Fig. 4, it is obvious that it will engage the weight 36 if the truck 10 is tipped forwardly upon its casters 14 toward the foot frame 31. Of course, the side rails could be extended so that they could be engaged directly by the latch members. As best shown in Fig. 4, each latch member 42 is pivoted by a pin 45 to a tube 46 which is preferably seated in the lower end of one of the posts 18, bolts 48, or the equivalent, being preferably provided to hold the tube 46 in place in the post 18. A slot 49 formed in the upper end of each tube 46 is aligned with the slot 43 formed in the associated post 18 so that the associated latch member may swing into a position wherein it is engageable with the weight 36. Carried by the tube 46 is a pin 50 which projects through an arcuate slot 52 formed in the latch member 42, the arrangement being such that the pin 50 limits the distance the latch member may project from the associated post. Referring to Figs. 5 and 6, it will be noted that, in this embodiment of the invention, the posts 18 are substantially rectangular in cross section and that the tubes 46 are circular in cross section.

Slidably journaled in each tube 46 is a tubular member or plunger 54 which is preferably provided with an exterior cylindrical surface 55 of less diameter than the interior surface of the tube 46. However, we preferably provide a plurality of annular flanges 57*a* upon the tubular member or plunger 54, which flanges 57*a* slidably engage the interior surface of the tube 46. At its upper end, the tube 46 is preferably closed by a disk 57, or the equivalent, engageable with the bottom edge of the associated latch member 42. A plug 60 preferably rigidly secured in the lower end of the tubular member or plunger 54 has the associated caster 13 swiveled to it.

Obviously, if the head frame 15 and the rear end of the truck 11 are raised from the floor, the weight of the casters 13 and the tubular members or plunger 54 will cause the casters to remain in engagement with the floor, the casters 13 and the tubular members or plungers 54 being displaced with respect to the post 18. This displacement of the tubular members or plungers 54 with respect to the posts 18 is limited by the bolts 48 which pass through slot 62 formed in the tubular members or plungers 54.

Referring to Fig. 4, it will be noted that the lower edges of the latch members 42 normally rest upon the upper ends of the tubular members or plungers 54 and upon the disks 57 carried thereby and that the latch members are pivoted to the tubes 46 in such manner that when the posts 18 are displaced in an upward direction to bring the lower edges of the latch members out of engagement with the tubular members or plungers 54 and the disks carried thereby, the latch members will gravitate into positions corresponding to the dotted line position shown of one of the latch members in Fig. 4. And if the posts 18 are subsequently lowered, the lower edges of the latch members 42 will be engaged by the upper ends of the tubular members or plungers 54 and by the disks 57 to swing the latch members 42 into positions wherein they do not project from the posts 18.

The manner in which the bed shown in Figs. 1 to 6, inclusive, is used or handled is believed to be obvious but for the purposes of this disclosure, a brief explanation will be made. When the bed is not in use, the side rails 29 preferably occupy the positions wherein they are shown in dotted lines in Fig. 1, the foot frame 31 being folded back to occupy positions parallel to and adjacent the side rails. Obviously, when the bed is folded in this manner, it may be stored in a closet, or the like, or may be positioned in a corner of a room. When the bed is to be used, the side rails and the foot frame are pulled down into the positions wherein they are shown in full lines in Fig. 1. The springs 37 and the counter weight 36 counter-balance the side rails and the foot frame so that it requires comparatively little effort to swing the side rails and the foot frame from their functionally operative positions to their functionally inoperative positions or vice versa. However, as set forth above, the springs 37 tend to angularly displace the truck 10 in a counter clockwise direction (Fig. 1) around the trunnions 27 to jack-knife the bed. Thus, the truck tends to tip forwardly on its casters 14 toward the foot frame 31 when the foot frame is in its functionally operative position. Such jack-knifing of the bed is prevented by the latch members 42 as when the truck 10 tends to tip toward the foot frame 31, the posts 18 are displaced away from the floor upon which the bed rests and the latch members are lifted from the upper ends of the tubular members 54 and the disks 57 carried thereby. This permits the latch members 42 to fall into positions wherein they project from the tubular posts 18 and lie in the path of the weight 36. Obviously, this prevents further upward movement of the posts and therefore prevents the truck from tipping into a position wherein the bed will be jack-knifed.

Referring now to Figs. 7, 8 and 9 wherein we have shown a bed embodying another form of the invention, we have employed similar reference numerals to designate parts of this bed which are substantially identical in construction to the bed shown in Figs. 1 to 6, inclusive. However, in the case of the bed shown in Figs. 7, 8 and 9, the letter "a" is added to the reference numerals which are employed to indicate parts similar to those provided in the bed shown in Figs. 1 to 6, inclusive. Thus, it will be noted that the improved bed shown in Figs. 7 to 9, inclusive, comprises a truck 10*a* having a frame 11*a* and casters 13*a* and 14*a*. Mounted upon the truck 10*a* is a head frame 15*a* and brackets 25*a*. Pivoted in sockets 26*a* provided in the brackets 25*a* are trunnions 27*a* preferably formed integral with plates 28*a*. which are rigidly secured to side rails 29*a*. Of course, the side rails 29*a* carry a foot frame (not shown) of any suitable construction. The side rails 29*a* and the foot frame (not shown) are counterbalanced by a weight 36*a* and tension springs 37*a* which are substantially identical in construction to the aforementioned weight 36 and springs 37, respectively. To prevent jack-knifing of the bed shown in Fig. 7, we preferably provide a plurality of latch members, one of which is shown at 42*a*. Each latch member 42*a* is pivoted by a pin 45*a* to two spaced angle irons 70 which are rigidly secured to the frame 11*a*, the latch member 42*a* being positioned between the angle irons 70. Slidably journaled in blocks 71 and 72 positioned between the angle irons 70 is a plunger 73 which at its lower end is provided with a foot 74 having a rounded surface 75 adapted to rest upon the floor. As best shown in Figs. 7 and 8, when the truck 10*a* and the side rails 29*a* occupy the relative positions wherein they are shown in these figures, the lower edge of the latch member 42*a* rests upon the upper end of the plunger 73 and the latch member 42*a* occupies a position wherein it will not engage the adjacent side rail 29*a* if the side rails are angularly displaced in a counterclockwise direction (Fig. 7) to collapse or fold the bed. However, if due to the action of the springs 37*a* or for any other reason, the truck 10*a* tends to pivot or move in a counterclockwise direction (Fig. 7) around the trunnions 27*a*, the rear

end of the truck 10*a* will be displaced in a direction away from the floor and the pivot point of the latch members 42*a* will also be raised. Then, as the weight of the plungers 73 causes the feet 75 thereof to remain in engagement with the floor, the latches 42*a* will gravitate into positions wherein they will engage the side rails 29*a* and prevent further angular displacement of the truck 10*a* in a counterclockwise direction (Fig. 7) around the trunnions 27*a*. Of course, the latch members 42*a* do not prevent the bed from being folded in a normal manner. Thus the side rails 29*a* may be quickly and easily swung into substantially upright positions and the foot frame (not shown) will fold back against them.

In Fig. 10, we have illustrated another embodiment of the invention; thus, we have shown a plunger 73*b* adapted to be employed in place of the plunger shown in Fig. 8. The plunger 73*b* is provided at its lower end with a caster 74*b*. Obviously, when the plungers 73 of the bed shown in Figs. 7 to 9, inclusive, are replaced by plungers 73*b* resembling those shown in Fig. 10, the casters 74*b* ride upon the floor. A bed embodying the construction shown in Fig. 10 is operated in substantially the same manner as a bed which embodies the construction shown in Figs. 7 to 9, inclusive.

In Fig. 11 we have shown mechanism which embodies another form of the invention and may be used in place of some of the mechanism shown in Fig. 4. The reference character 18*c* designates a hollow post which forms part of a folding bed substantially identical to the bed shown in Figs. 1 to 6, inclusive. However, in this instance, a latch member 42*c* is used in place of the latch member 42 shown in Fig. 4, the latch member 42*c* being pivoted by a pin 45*c* to a tube 46*c* which is secured in the post 18*c*. The tube 46*c* and the post 18*c* are slotted so that the latch member 42*c* may move into the position wherein it is shown in dotted lines in Fig. 11, displacement of the latch member 42*c* around the pin 45*c* being limited by a pin 50*c* which rides in a slot 52*c* formed in the latch member 42*c*. The pin 50*c* is carried by the tube 46*c*. Bolts 48*c*, or the equivalent, are provided for securing the tube 46*c* to the post 18*c* and a tubular member 54*c* slidably journaled in the post 18*c* is provided with slots 62*c* which permit longitudinal displacement of the post 18*c* relative to the tubular member 54*c*. A link 100*c* has one of its ends pivoted by a pin 101*c* to the tubular member 54*c* and has the other of its ends pivoted by a pin 102*c* to the latch member 42*c*. Of course, the tubular member 54*c* has a caster (not shown) swiveled to its lower end and the construction is such that when the bed of which the post 18c forms a part tends to jack-knife, the post 18*c* moves upward and raises the pin 45*c* in such manner that the link 100*c* causes the latch member 42*c* to swing into the position wherein it is shown in dotted lines in Fig. 11. When the latch member is in this position, it is adapted to engage the weight (not shown) or an equivalent part provided upon the bed of which the post 18*c* forms a part.

Having thus described our invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of our invention; hence we do not wish to be understood as limiting ourselves to the exact form, construction, arrangement and combination of parts herein shown and described, or uses mentioned.

What we claim as new and desire to secure by Letters Patent is:

1. In a device of the class described, a truck, a head frame comprising slotted vertical tubular members, body supporting means pivoted to said head frame, a foot frame carried by said body supporting means, means for counter-balancing said body supporting means and said foot frame, a latch member having means by which it is pivotally secured in one of said slotted vertical tubular members, and means telescoping within said vertical tubular member and normally engaging said latch member for maintaining it in inoperative position, said means being movable by gravity out of engagement with said latch member when said head member is raised, said latch member being movable through said slot into engagement with said body supporting means upon said movement of said head member.

2. In a bed, the combination of a head frame including a tubular portion having a slot formed therein, a body supporting frame secured to the head frame for pivotal movement relatively to the head frame into and out of functional operative positions, and means for preventing jack-knifing of the bed structure, said means including a member arranged within said tubular portion of the head frame and being movable through said slot of the tubular portion into and out of operative relationship with the body supporting frame.

3. In a bed, the combination of a head frame having a tubular leg, a body supporting frame pivotally secured to the head frame for movement to and from body supporting positions, a member arranged for movement in said leg, means for limiting movement of said member, an element adapted for cooperation with the body supporting frame to limit pivotal movement of the body supporting frame, said tubular leg having an opening, said element being movable in a vertical plane in said opening into and out of cooperating relation with the body supporting frame, said member arranged in said leg

providing means for controlling movement of said element.

4. In a bed, the combination of a head frame having a tubular leg, a body supporting frame pivotally secured to the head frame for movement to and from body supporting positions, a member arranged for movement in said leg, means for limiting movement of said member, an element adapted for cooperation with the body supporting frame to limit pivotal movement of the body supporting frame, said element being pivoted and having the pivot thereof offset with relation to the center of gravity thereof, said tubular leg having an opening, said element being movable in said opening into and out of cooperating relation with the body supporting frame, an end of said member arranged in said leg being in engagement with an end of said pivotal element and providing means for controlling movement of said element.

In testimony whereof, we have hereunto signed our names.

WILLIAM A. MATHESON.
WILLIAM P. BOWER.