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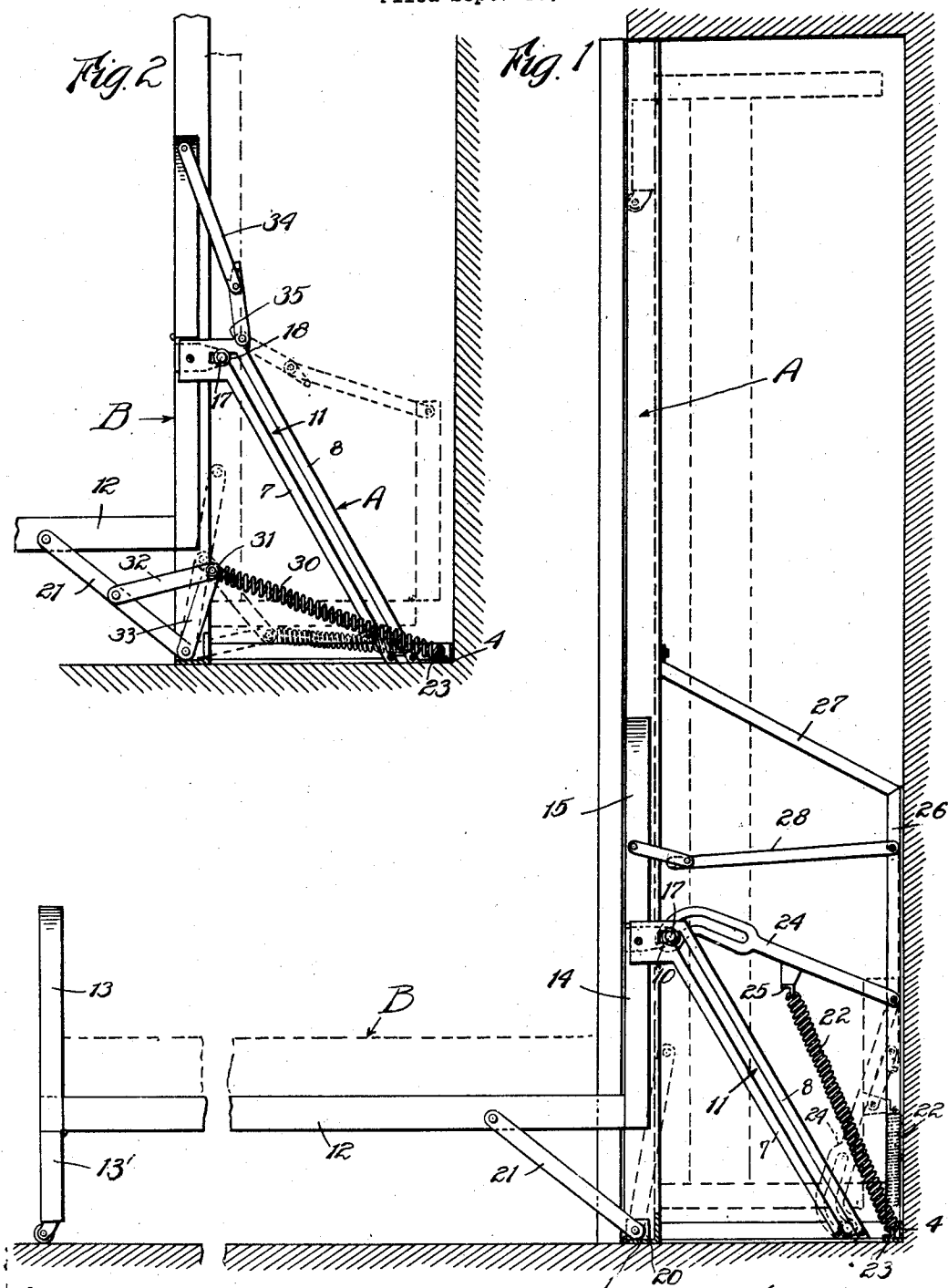
L. MUCHLINSKI

1,820,672

RECESS FOLDING BED

Filed Sept. 10, 1927

3 Sheets-Sheet 1



Witness:
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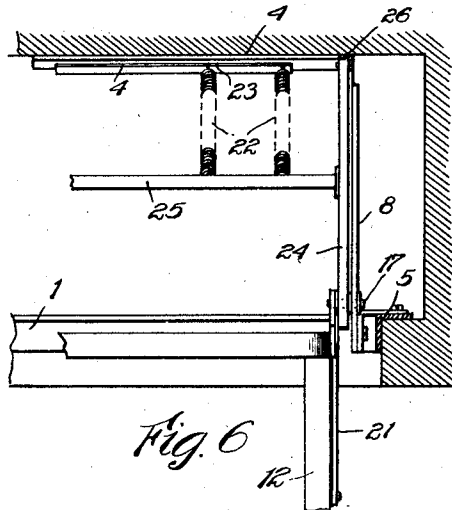
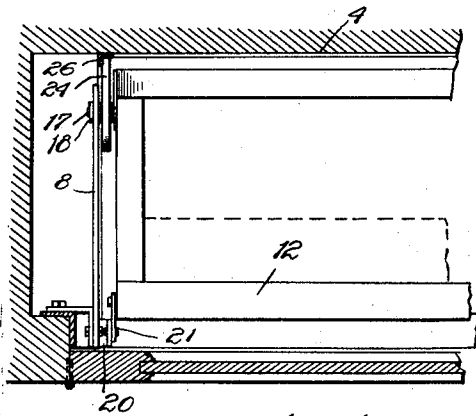
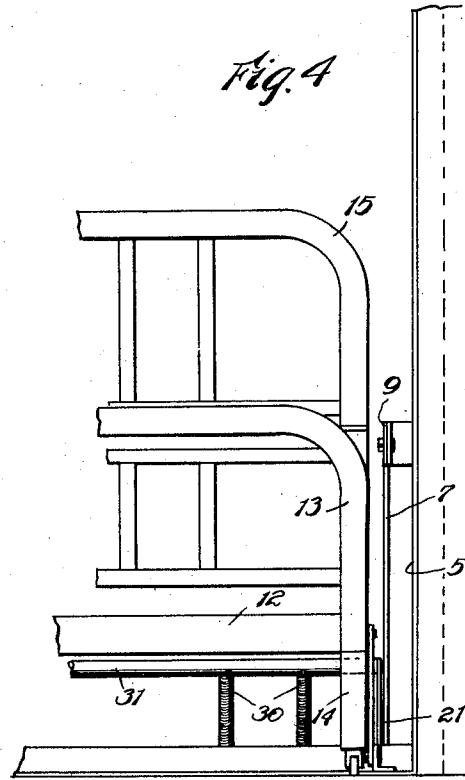
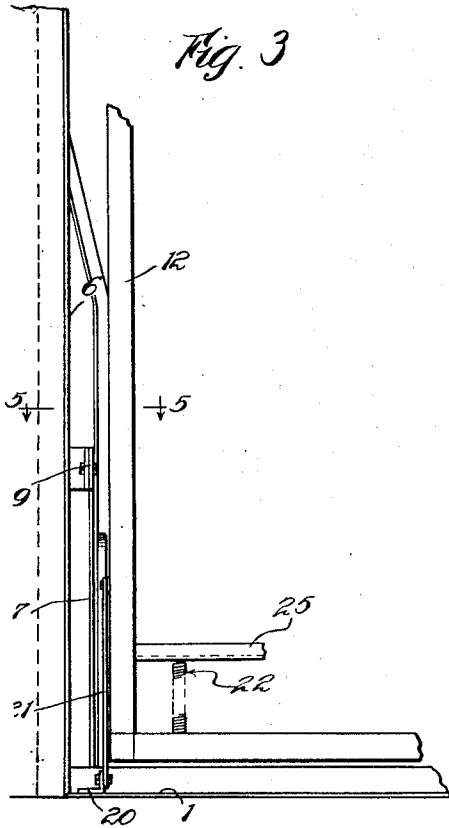
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3 Sheets-Sheet 2



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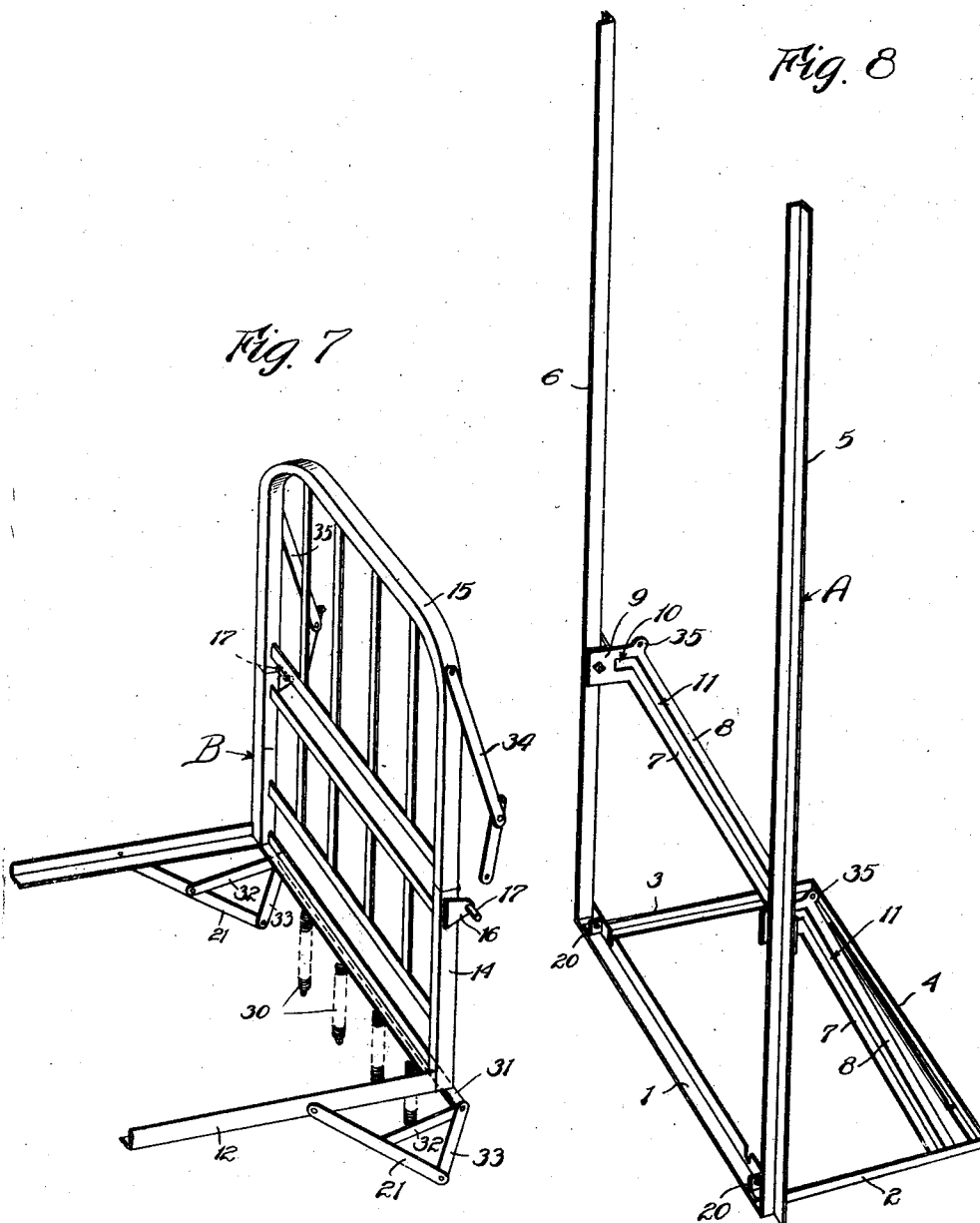
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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RECESS FOLDING BED

Application filed September 10, 1927. Serial No. 218,690.

This invention relates to improvements in folding beds, more particularly of the type wherein the bed body is foldable into and out of a recess in a wall. Heretofore, such beds have been objectionable because the head of the bed remained in the recess when the bed was extended or unfolded, and one of the main objects of this invention is to provide suitable operating mechanism whereby the bed body is moved entirely out of the recess when extended.

Also, in such beds, it has usually been necessary to attach one or more support brackets, plates, or like members to the walls or floor of the closet for anchoring the links, guides, and other members of the bed. While these pieces could be comparatively easily attached in the older types of buildings having wooden door frames, floors, or joists, in the more modern structures of cement and metal, places for fastening the members are not as readily available. Every installation required considerable special construction, and the supports were mainly built into the recess or closet. Obviously this involved considerable labor and expense, and, since the structure could not be standardized by the bed manufacturer, the support was apt to be weak and the fastenings insecure. Therefore, another object of this invention is to provide a wall bed having a support or framework which can be built independently, ready to be set into the closet without depending upon the walls or building structure for fastenings. The building walls are not damaged in the installation, and the closet can either be made very small or the bed may be installed in any size or shape of closet, without making special provisions for the bed.

Other objects are to provide a simple folding mechanism for the beds which can be manufactured at low expense, and which is durable and reliable in use; to provide a wall bed which can be easily handled without heavy lifting or pulling; to provide a folding bed having a rigid vertical support for the head end, when the bed is unfolded; to provide such a device in which the operator or occupant is safeguarded from injury due to

failure or breakage of any of the parts; and to provide an independent supporting frame which can be separately installed and the bed thereafter attached in position.

Illustrative embodiments of this invention are shown in the accompanying drawings in which:

Figure 1 is a cross-sectional view of the bed and recess, showing the bed in full lines in the unfolded position, and in broken lines in the position folded into the recess, the section being taken just inside of the framework on the near side of the bed.

Fig. 2 is a fragmental view taken similarly to Fig. 1, showing a simplified arrangement of the counter-balance spring and the head folding brace.

Fig. 3 is a front elevation of the lefthand lower corner of the form shown in Fig. 1, with the bed in the folded position.

Fig. 4 is a view of the right-hand lower portion of the form shown in Fig. 2, with the bed unfolded or open.

Fig. 5 is a plan section taken on the line 5-5 of Fig. 3.

Fig. 6 is a plan section taken similarly to the view of Fig. 5, but showing the bed unfolded.

Fig. 7 and Fig. 8 are perspective views of the bed and frame respectively of the construction shown in Fig. 2.

In the structures illustrated, the bed body is pivotally secured to the supporting frame by means of a link at either side, and the bed body is positively guided, as by a pin secured to the bed body frame engaging in a suitable guideway in the support frame, so that the links swing from a folded position slightly beyond the horizontal, to an outwardly inclined position, the bed being rotated on the pivotal axis at the outer ends of the links from a vertical position in the recess to a horizontal position on the floor, and being swung entirely out of the recess by the pivotal movement of the links.

To describe the construction and operation more in detail, reference is made to the several views of the accompanying drawings, and the main essential construction which is

common to both forms which have been shown will now be described.

The support frame A consists essentially of the sill member 1, and the light angle iron base frame consisting of the rearwardly extending side members 2 and 3, which are secured to the sill member, the transverse member 4, connecting the rear ends of said side members, and the vertical side members 5 and 6 which are mounted at the ends of the sill member 1.

At either side of the support frame are secured the guide members which consist of the two spaced bars 7 and 8 which are secured to the side members 2 of the base frame at the lower end, and extend in an inclined direction to terminate in stampings 9 at the upper end, which are removably secured by bolting to the side members 5 and 6. The slot 10 in the stamping is formed to provide a short horizontal portion at the upper end of the slot or guideway 11 which is formed between the members 7 and 8.

The bed body B is of the usual form of metal construction and consists of a rectangular bottom frame 12, the foot frame 13, the hinged legs 13', attached to the foot frame, the end frame 14, and the head frame portion 15 which is hinged to the portion 14. At the sides of the end frame 14 are attached plates 16 in which are mounted the pins 17. The pins 17 are slidably engaged in the guide slots 11 when the bed is assembled into the frame A, and the pins are preferably provided with washers 18 at either side of the guide members to prevent the pins from withdrawing from the slots.

Short brackets 20 are secured to the sill member 1, to which are pivotally connected the lower ends of the fulcrum links 21. The outer ends of the links 21 are pivotally connected to the bottom frame 12 of the bed, at the sides thereof. When the bed is extended, the outer end is supported by the legs 13' which swing up against the bottom frame when the bed is folded, as shown in dotted lines in Fig. 1; and the upper portion 15 of the head frame is hinged to fold inwardly so as to economize in the depth of the space required for the folded bed.

In the form shown in Figs. 1, 3, 5 and 6, the counter-balance springs 22 are anchored at their lower ends to a small angle sectioned member 23 which is riveted to the rear base frame member 4, and the springs are applied to the bed through the levers 24. The springs 22 are attached at their upper ends to a transverse member 25 which is mounted on the levers 24, and said levers are pivoted to the upright frame members 26 which are attached to the rear corners of the base frame, and connected at their upper ends to the side members 5 and 6 by means of the slanting brace 27. The levers 24 bear, at their outer ends,

upon the pins 17, the ends of the levers being slotted to receive the pins.

In this construction, the position of the head portion 15 of the bed body is governed by means of the jointed braces 28 which are pivotally connected at one end to the head frame 15, and at the rear end to the vertical frame members 26.

In the extended position, the head end of the bed body is supported vertically by the pins 17, since the pins are then engaging in the horizontal portions 10 at the upper ends of the guideways 11, and the bed body is held longitudinally by the links 21 which are then in an outwardly inclined position. The braces 28 are then under tension to hold the portion 15 upright because the hinge is at the front side and the frame can only swing forwardly.

The outer ends of the levers 24 are curved to apply the tension of the counter-balance springs in an angular direction to move the pins inwardly, so as to tend to lift the outer end of the bed, and lighten the load of lifting the same. The weight on the bed body, even at the head end, can have no tendency to cause the bed to fold, unless the outer end of the bed body is lifted. As the springs 22 contract the pins 17 are moved inwardly in the slots of the levers 24 and the effective lever arms are shortened thereby allowing the tension in the springs to exert a substantially uniform force on the bed body.

In the form described above, as the bed body is lifted, the springs 22 exert pressure on the pins 17 through the levers 24, to force the pins downwardly into guide slots and to rotate the bed body upon both of the pivotal axes at the ends of the links, so that the body is turned and also swung inwardly by the rotation of the links, all positions being positively determined by means of the pins in the guideways. The force of the springs decreases as the springs are shortened, and the center of gravity of the body simultaneously moves over the pivotal support at the lower ends of the links 21.

In the folded position, the weight of the bed body is moved beyond the link supports and the pins 17 rest in the lower ends of the guide slots 11. The links then slant inwardly to hold the bed body stable in that position, but only a slight pull is required to start the bed to unfolding and move the load across the pivotal axis of support. The curved ends of the levers 24 are also effective in exerting a counter-rotational effort to assist in starting the unfolding, since a lifting force is thereby exerted to raise the links.

In the folded position, the brace member 28 is again extended and under tension to hold the head body frame 15 vertical. In unfolding, the greater portion of the weight of the body is counter-balanced by the springs which increase in tension and effec-

tiveness of application as the load is moved out on the point of support. In the unfolded position, the links assume their outwardly inclined position to oppose the tendency of the springs to move the bed body inwardly, but only a slight lifting force is required to dislodge the pins 17 from their horizontal seat in the upper end of the guideway.

In the form shown in Figs. 2, 4, 7 and 8, the counter-balance springs 30 are anchored to the angle member 23, which is secured to the rear member 4 of the base frame, but the force of the springs is applied directly to the links 21. The tubular cross member 31 is rigidly attached to the links 21 by means of the angularly disposed braces 32 and 33 at either end, and the forward ends of the springs 30 are attached to said cross member 31. In this arrangement, the springs are entirely behind the bed body, and are underneath the head when the bed is folded, as indicated in dotted lines in Fig. 2.

In the extended position of the bed, the springs are stretched and the force of the springs is applied on the longest radius about the rotational axis at the lower ends of the links 21. This force tends to lift the lower end of the bed body but also tends to force the pins 17 against the upper side of the horizontal slot portions 10, rather than to move the pins rearwardly in the slot, unless the outer end of the bed body is lifted. Therefore, in the unfolded position there is no tendency to fold up or "jack-knife." In this form the head brace 34 is shown as being attached to brackets 35 which are provided on the upper ends of the guide members 8.

As soon as the head of the bed body is raised, the pins enter the inclined portions of the guideway and the springs tend to lift and swing the body until the pins rest in the bottoms of the slots 11, in the same manner as in the form described above. In the folded position the springs are considerably shortened, and exert their force on a very short radius of application; consequently, the springs exert very little resistance to initially moving the bed body to swing the center of gravity over the rotational support.

It is manifest that the frames in either of the forms shown can be readily installed in the closet or recess. The bed body can then be mounted by turning it to enter the pins 17 in the guide slots 11 and then securing the lower ends of the links 21 to the brackets 20 on the sill member 1. The ends of the counter-balance springs are easily secured to the base frame after the bed body is in place. In the form shown in Fig. 1, the levers 24 may be engaged on the pins 17 by unbolting the upper ends of the guide members if necessary.

The bed is stable in either the unfolded or folded position; very little effort is required to open or close the bed; the character of the

support is not dependent upon the building construction; the bed occupies a minimum amount of space when folded, and the bed body is projected entirely out of said space when unfolded and ready for use.

While but two illustrative embodiments of this invention have been herein shown and described, it will be understood that details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

I claim:

1. In a wall recess bed, a supporting frame structure comprising upright angle irons having flanges projecting laterally for fitting the inner corners of a door frame in a wall recess, a supporting base adapted to rest upon the floor and extending rearwardly from the angle irons and combined guiding and bracing members extending upwardly from the rear portion of the base to the angle irons, and a bed pivoted to said frame structure for movement from a horizontal position extending from said frame structure to a vertical position within said frame structure and guided in said movement by the combined guiding and bracing members of the supporting frame structure.

2. In a wall recess bed, a bed body, a support comprising an outwardly inclined guideway having a short horizontal section at its upper end, a pin secured to the bed body and slidably engaged in said guideway, a link for pivotally connecting the bed body to the support, a lever pivoted to said support comprising a curved end portion having an arcuate slot therein for receiving said pin and camming it from the horizontal portion of said guideway to the inclined portion thereof when the bed body is lifted, and a spring attached at one end to said support and at its other end to said lever for actuating the latter and counterbalancing the weight of the bed body.

3. In a wall recess bed, a bed body, a support comprising an outwardly inclined guideway, a pin secured to the bed body and slidably engaged in said guideway, a link pivotally connecting the bed body with the support, counterbalancing mechanism comprising a lever pivotally mounted on the support, a spring connected at one end with said lever and at its other end with said support for actuating said lever, and an end section on said lever having a slot therein receiving said pin for providing a slidable connection between said bed body and counterbalancing means to effectively utilize the tension in said spring as the latter approaches its contracted limit.

4. In a wall recess bed, a bed body, a support comprising an outwardly inclined guideway having a short horizontal portion at its upper end, a pin secured to the bed body and

slidably engaged in said guideway, a link
pivotally connecting the bed body to the sup-
port, counterbalancing mechanism compris-
ing a lever pivotally mounted on the support
15 having a longitudinal slot therein for receiv-
ing said pin, a spring connected at one end
with said lever and at its other end with said
support for actuating said lever, and a curved
end portion on said lever having an arcuate
10 slot therein communicative with said longi-
tudinal slot for providing a slidable connec-
tion between said bed body and counterbal-
ancing means, to effectively utilize the ten-
sion in said spring as the latter approaches
15 its contracted limit, said curved portion
being adapted to cam said pin from the hori-
zontal portion of said guideway to the in-
clined portion thereof during the initial up-
ward rotation of the foot portion of said bed
20 body.

Signed at Chicago this 8th day of Septem-
ber, 1927.

LEON MUCHLINSKI.

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