

Oct. 4, 1932.

L. D. DOBBS

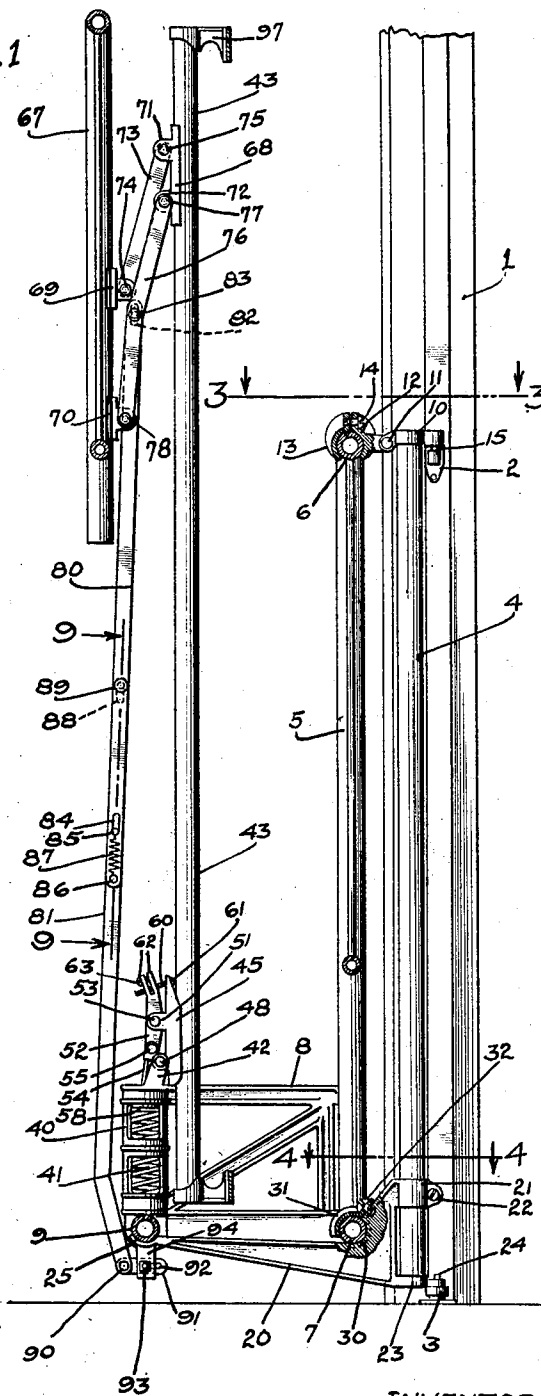
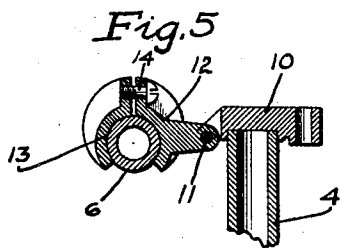
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3-Sheets-Sheet 1

Fig. 1



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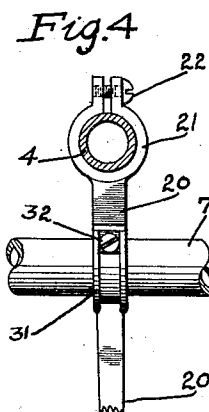
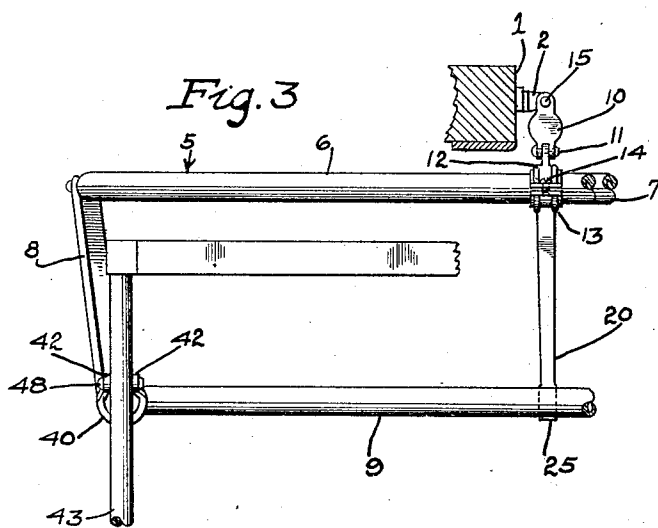
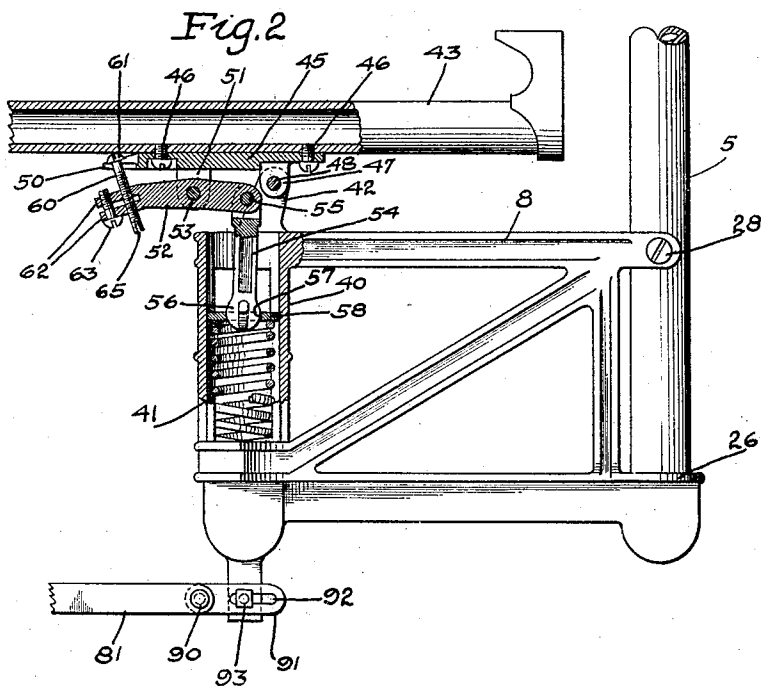
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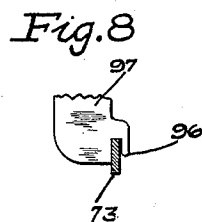
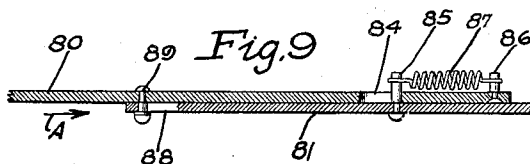
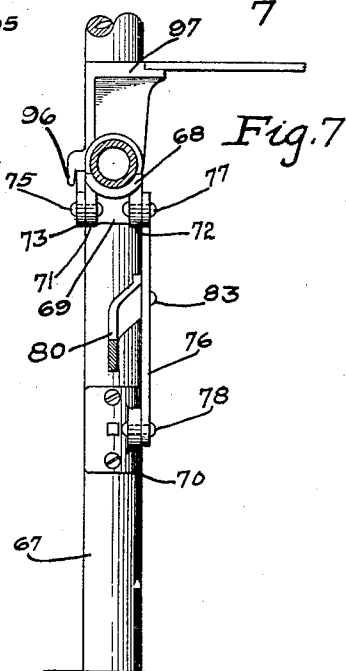
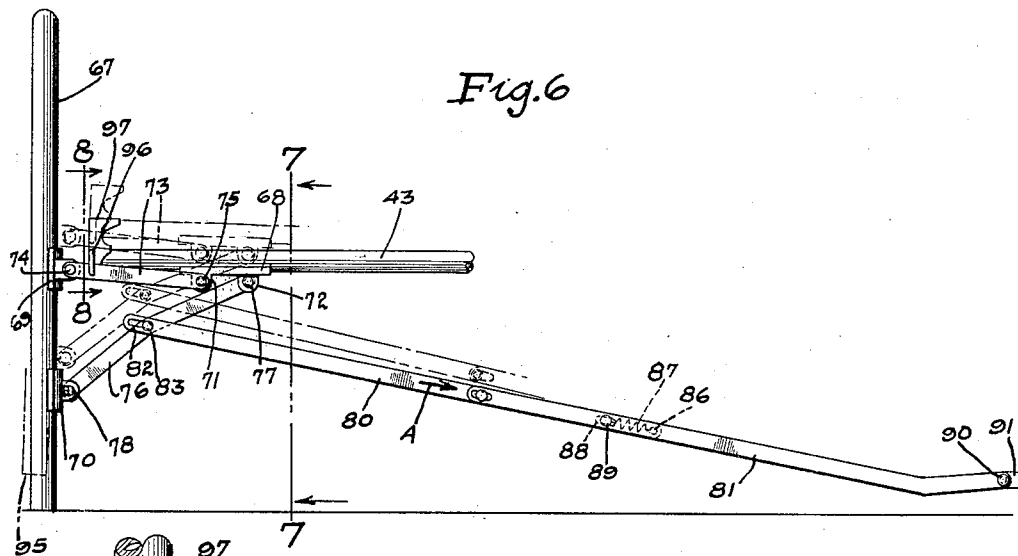
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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BED

Application filed December 11, 1929. Serial No. 413,272.

This invention relates to new and useful improvements in folding beds of the type wherein that portion of the device which supports the usual spring and mattress is pivotally connected at one end to a foot frame, which forms a part of a head frame, in turn swingingly attached in a door opening. In devices of this kind, the mattress and foot frames are swung to a vertical position, and then the whole structure is swung to storage position.

Among the objects of the present invention is to provide means, operable in conjunction with the hinged connection of the mattress frame and the head frame, for counterbalancing the weight of the mattress and foot frames, bed spring, mattress, etc., and to provide means which is adjustable to vary the counterbalancing force. Another object is to provide improved means whereby the head frame may be adjusted transversely with respect to the means by which it is hinged in the door opening. A further object is to provide a foot frame pivoted to the mattress frame and to provide means to cause this foot frame to assume a fixed substantially perpendicular relation to the mattress frame before its foot portions engage the floor, and thus prevent injury to floor or floor covering, as the result of movement after such engagement.

Features of the invention include, along with the broader aspects, all details of construction shown in the drawings.

Objects, advantages and features of the invention will appear in the description of the drawings forming a part of this application and in said drawings:

Figure 1 is a vertical section showing the improved bed structure in folded position;

Figure 2 is a vertical section illustrating the hinging and adjustable counter-balancing mechanism;

Figure 3 is a plan section on line 3—3 of Figure 1 illustrating the means for trans-

versely adjusting the head frame with reference to its pivotal support;

Figure 4 is a plan section on line 4—4 of Figure 1 further illustrating the means for adjustably securing the head frame to its pivotal support, this portion of the apparatus also acting to support a horizontal extension or foot of said head frame;

Figure 5 is a detail vertical section of the top portion of the head frame attaching and adjusting means;

Figure 6 is a fragmentary side elevation illustrating the means for causing the foot frame to assume a fixed, substantially perpendicular, relation to the bed frame;

Figure 7 is a vertical section on line 7—7 of Figure 6;

Figure 8 is a vertical section on line 8—8 of Figure 6 illustrating the stop; and

Figure 9 is a section on line 9—9 of Figure 1 illustrating the extensible linkage between the head frame, and link connections between the mattress and foot frames.

Numerals 1 indicates a door opening; 2 and 3 respectively indicate upper and lower brackets secured to or adjacent one vertical surface of the door opening. Pivotaly attached to the brackets 2 and 3 is a head frame including a swing post 4, a head frame 5 having upper and lower cross bars 6—7, and having frame extensions indicated at 8. These frame extensions are connected transversely at their forward ends by means of a tubular element 9, see Figures 1 and 3.

The head frame 5 is connected to the swing post 4 by means which permits transverse adjustment of the head frame relative to said swing post, and this is a feature of the invention. The swing post is provided at its upper end, see Figure 5, with a cap 10 suitably connected either detachably or by brazing or spot welding. To this element 10 is pivoted as at 11 one member 12 of a clamp, the other member of which clamp is shown at 13. The elements 12 and 13 are held in

clamping engagement with the top rail 6 of the head frame by means of a set screw 14. The element 10 is pivoted to the element 2 by means of a pin 15. By inspection of Figure 3, it will be seen that the pivot 11 provides means detachably securing the clamp to the cap plate 10 of the swing post. The head frame is adjustably connected at its lower end to a bracket 20 which bracket includes an extension having a split collar 21 (see Figures 1 and 4) clampingly attached to the swing post 4 by means of the screw 22. The lower end of the bracket has an extension 23 in which the lower end of the swing post is socketed. A pin 24 pivotally connects this extension to the lower hinge bracket 3 which is, in this instance, attached to the floor. The outer end of the arm or bracket 20 is provided with a depression 25 which receives the transverse tubular member 9 which cross-connects and is socketed in the frames 8. These frames 8 are secured by suitable means to the side posts of the head frame which means includes (see Figure 2) a lower socket member 26 and a screw 28.

The frame 20 is provided with a socket 30 which receives the lower transverse tubular element 7 of the head frame. A clamping element 31, having a corresponding socket, is arranged as shown in Figures 1 and 4, and a clamping screw 32 secures the parts. In assembling, the tubular elements 6 and 7 are placed against elements 12, 20, and elements 13 and 31 are then applied, and the parts clamped by means of the screws 14 and 32. If on trial, the frame 5 does not have the proper transverse position, the clamps may be released and the frame properly adjusted lengthwise and reclamped. This is a very valuable feature of the invention. The means for detachably and adjustably connecting the head frame and supporting it also form an important feature of the invention, not only facilitating adjustment of the parts after assembly but facilitating assembly.

Another important feature of the invention pertains to the means now to be described for pivotally connecting the mattress frame section of the bed to the head frame and for counter-balancing the weight of the bed frame spring and mattress, and for adjusting the counter-balancing force required to offset the weight of the frame, spring and mattress. Referring to Figures 1 and 2. Each frame 8 has the form of a casting, and the two frames together form a kind of socket, downwardly into which the head end of the mattress frame swings, in the manner shown in Figure 1. Each frame 8 has a vertical tubular housing 40, within which is placed a compression spring 41. Each frame 8 is provided with ears 42. Each of the side rails 43 of the mattress frame has detachably secured thereto a plate or bracket 45, the de-

tachable connection being made by means of screws 46, see Figure 2. This is a feature. This bracket 45 has a projection 47 through which projection and the ears 42 passes a pivot 48, thus swingingly connecting the mattress frame to the foot frame 8 of the head frame, at a point outwardly from the head frame in a direction toward the foot of the bed. The plate 45 has formed therein at one end a slot 50, and also has ears or projections 51 between which is detachably pivoted a lever 52, by means of a pivot 53. One end of the lever 52 has pivoted thereto a plunger 54, the pivot being indicated at 55. The lower end 56 of this plunger is substantially spherical and fits into a corresponding opening 57 of a plate 58, forming a swiveled joint. The plate rests upon the top of the compression spring. Means for adjusting this lever with respect to the plate 45, consists of a screw having a shank 60 in threaded engagement with one end of the lever 52 as shown, said shank passing through the slot 50 and having a head 61 which is disposed as shown between plate 45 and rail 43, the shank being thus locked against translation. The end of the lever 52 is notched to form spring fingers 62 through which the shank 60 passes, and with which it has threaded engagement. A set screw 63 functions to flex the fingers toward one another and lock the screw shank 60 against turning. The shank 60 has a screw driver slot 65 for rotating the shank to adjustably rock the lever 52 and vary the tension of spring 41. All constructional details of the foregoing device are claimed, along with the broader ideas of means which provide an adjustment of the tension of the spring 41. What might be termed a micro-metric adjustment is thus provided for the spring 41.

Another valuable feature of the invention relates to the means for causing a pivoted foot frame to assume a substantially perpendicular and fixed relation to the mattress frame, before its foot portions engage the floor, to prevent adjusting motions thereof after engagement, and therefore to prevent marring of the floor or floor covering.

Referring to Figures 1, and 6 to 8. The foot frame is indicated at 67, and is pivoted by means of links to the side bars 43 of the mattress frame, see Figures 1 and 6. Sets of linkages are arranged, one set at each side of the bed. Each set includes brackets 68, one attached to each side bar 43 of the mattress frame, along with a pair of brackets 69—70 attached in spaced relation as shown, one pair to each vertical side bar of the foot frame 67. The bracket 68 provides spaced lugs respectively numbered 71 and 72. As shown in Figure 7, the lugs 72 and 71 of plate 68 are arranged at opposite sides, the lug 71 at the outer side and the lug 72 at the inner side of the plate. A straight link 73

is pivoted as at 74—75 respectively to the upper plate of the foot frame and the lug 71 of plate 68 or that lug which is nearest the foot frame. A second link 76 is connected as at 77—78 respectively to the lug 72 which is farthest from the foot frame and to the lowermost bracket 70 of the foot frame. The links 73 and 76 are therefore so connected and arranged that they lie in substantially parallel relation, when the mattress frame is raised (see Figure 1) and act to cause the foot frame to also assume a position substantially parallel with the mattress frame. The linkage is, moreover, arranged so as to bring the foot frame to a substantially perpendicular position with respect to the mattress frame, before said mattress frame reaches its lowermost position, that is before the foot frame touches the floor.

The means now to be described has the form of an extensible linkage for securing the links 73—76 to prevent motion of the foot portions of the foot frame, after engagement with the floor, that is to yieldably yet positively lock the foot frame in perpendicular relation to the mattress frame, before said frame touches the floor.

The means above mentioned comprises two links respectively designated 80—81. The link 80 is slotted as at 82 and is connected by a pin 83 passing through the slot, to the link 76. The opposite end of this link 80 is provided (see Figure 9) with a slot 84, and the link 81 has a pin 85 extending through this slot. The link 80 is further provided with a pin 86 and a spring 87 connects the pins 85—86. The link 81 is provided with a slot 88 and a pin 89 carried by link 80 passes therethrough. The slots 84—88 and the pin connections form guides, and permit the elements to move with respect to one another lengthwise. The function of the spring 87 is to draw the parts to the position shown in Figure 9 to lengthen the linkage. It, therefore, appears that the linkage, including the elements aforesaid, is longest when in the position shown in Figure 1, that is when the bed is in upright position. The opposite end of the link 81 (see Figures 1 and 3) is pivoted as at 90 to a bracket 91 which is slotted as at 92. A pin 93 passes through the slot and adjustably connects the bracket 91 to an extension 94 of the frame 8. By this means the bracket 91 can be adjusted to vary the lengthwise position of the linkage for purposes to be later set forth.

The operation of this linkage is as follows: First assuming the bed in the uppermost position shown in Figure 1. The pivots 48—90 and 83 are so related that as the mattress frame swings downwardly the lowermost or innermost end of the slot 82 engages, by thrust motion, the pin 83 and moves the links 76—73 and therefore the head

frame, to the positions shown in full lines in Figure 6. However, by the practice of this invention, although the foot frame 67 moves during the greater portion of the movement of the mattress frame downwardly, its motion is positively interrupted before the foot portions of the foot frame reach the floor. The position at which this motion substantially stops is indicated by dotted lines in Figure 6, the bottom or floor engaging portion of the foot frame being indicated in that figure in dotted lines at 95 and the position of links 73 and 76 also being shown. The swinging motion of the elements of the foot frame 67 is interrupted by a stop 96 formed on the transverse connecting end piece 97 of the mattress frame, the upper edge of the link 73 engaging the stop as shown in Figures 6 and 8. At the position represented by dotted lines, the linkage 80—81 has not as yet been shortened, but during continued downward movement of the frame 43, the link 80 is moved lengthwise against the action of the spring 87 in direction of the arrow A, see Figures 6 and 9, thereby yieldably yet forcibly holding the link 73 against the stop, so that no further motion of the foot frame can take place, and therefore so that all adjusting motions of said frame are stopped before its foot portions touch the floor.

I claim as my invention:

1. A head frame having a spring, a bed frame, means pivoting said bed frame above said spring, means adapted to compress the spring when the bed frame is lowered, a lever pivoted to the bed frame adjacent the housing, means pivoting one end of the lever to the spring compressing means and means adjustably connecting the opposite end of the lever with the bed frame, said means including a screw and means detachably securing its head to the bed frame, and means on the lever for clamping the screw after adjustment.

2. A head frame having a tubular housing, a compression spring in said housing, a bed spring frame and means pivoting said frame to the head frame at a point directly over the housing, a plunger in the housing adapted to act on the spring to compress it, a lever pivoted to the bed spring frame adjacent the housing but at a point nearer the foot portion than to the spring frame pivoting means, means pivoting one end of the lever of the plunger at a point adjacent the spring frame pivoting means, a screw having threaded engagement with the opposite end of the lever and having a head above the lever, means rotatably but nontranslatably securing the head of the screw to the bed spring frame, the lower end of the screw having a slot by which the screw can be rotated, which slot is accessible from beneath the lever.

3. A head frame having a spring socket,
a compression spring in said socket, a bed
spring frame, means pivoting said frame to
the bed frame, a plunger adapted to com-
5 press the spring, a lever pivoted to the bed
spring frame, means pivoting one end of the
lever to the plunger, a screw having thread-
ed engagement with the opposite end of the
lever and means rotatably but non-translat-
10 ably securing the head of the screw to the
bed spring frame, the opposite end of the
screw having a slot by which the screw can
be rotated.

In witness whereof, I have hereunto set
15 my hand this 3d day of December, 1929.

LOYLE D. DOBBS.

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