

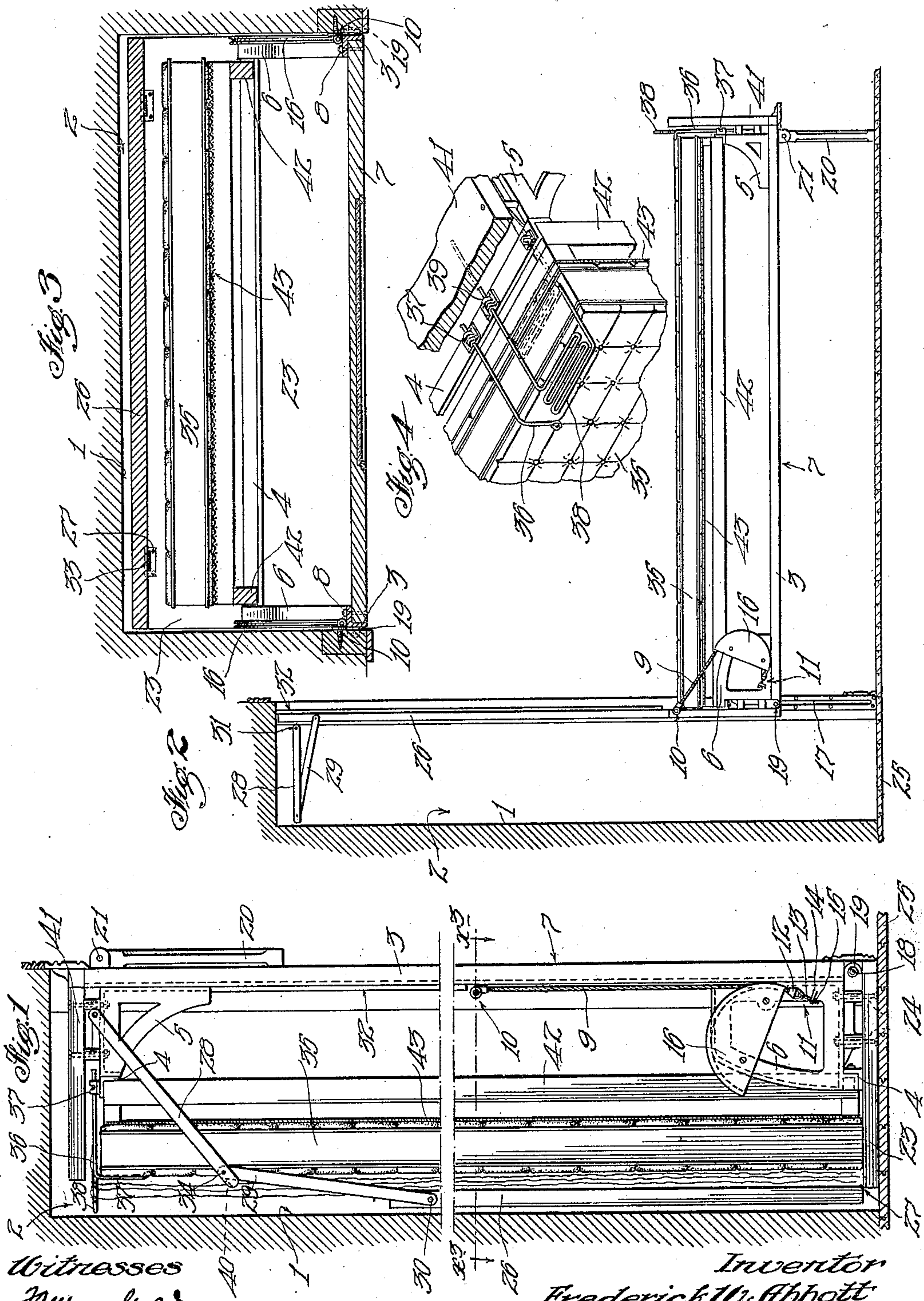
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FOLDING BED.

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934,644.

Patented Sept. 21, 1909.



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UNITED STATES PATENT OFFICE.

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To all whom it may concern:

Be it known that I, FREDERICK W. ABBOTT, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Improvement in Folding Beds, of which the following is a specification.

This invention relates to folding beds of the class wherein the bed folds or turns up into a frame or wall recess, and the main object thereof is to provide improved means for the pivotal support of the bed in such manner that the head end of the bed is raised automatically from the floor when the bed is lowered, and at the same time the bed is extended fully into the room, or exteriorly of the frame.

A further object of the invention is to minimize the depth of recess required for the reception of the bed when raised.

Another object of the invention is to avoid as far as possible the use of counter-weight devices for balancing the bed, the support of the bed being such that the bed is to a large extent self-balancing.

Another object of the invention is to provide improved head board means for the bed adapted to close the bed-containing recess in the casing when the bed is lowered.

Another object of the invention is to provide improved means for ventilating the bed clothing.

The accompanying drawings illustrate the invention.

Figure 1 is a side elevation of the bed in raised position with the containing recessed casing in section. Fig. 2 is a similar view showing the bed in lowered position. Fig. 3 is a horizontal section on the line x^3-x^3 in Fig. 1. Fig. 4 is a fragmentary perspective showing a bed clothes hanger on the bed frame.

1 designates a wall, supporting frame, or casing having a recess 2 into which the bed is adapted to fold or turn up. The bed comprises a frame consisting of longitudinal members or bars 3, preferably of angle iron connected or secured to transverse members 4, also preferably of angle iron; corner pieces 5 being provided at each foot corner of the bed, and corner pieces or brackets 6 being provided at each head corner of the bed, all of the aforesaid parts being rigidly connected to form a rigid frame. The front or face 7 of the bed, that is to say, the part that

appears when the bed is raised, is not an essential part of the bed frame construction and may therefore be relatively light. Said front is shown as consisting of wood and fastened at 8 to the bed frame, but it may be of any light material. The fastening at 8 is by screw bolts as indicated in Fig. 3 which enable the front to be attached or removed when the bed frame is in place. At its head end the bed is supported by flexible suspension means consisting of wire cables 9, whose upper ends are pivoted at 10 to the sides of the fixed frame 1 and whose lower ends are connected at 11 to the bed frame; for example, to the brackets 6 thereon, the connection of these cable suspension devices being preferably adjustable to regulate the effective length of the cable and the height of support of the bed when in raised position. For this purpose the end of the cable has a yoke-shaped head 12 formed thereon and a screw 13 passes rotatably through a lug 14 on the bracket 6 and engages a nut 15 in said yoke-shaped head to draw on the cable. Means are provided on said bed frame for engaging said flexible suspension means in such manner as to deflect, bend or roll up the same as the bed is lowered, thereby lifting the head end of the bed, said means consisting of a segmental plate 16 secured or rigidly connected to the bracket 6 at each side of the bed, the outer face of said plate being grooved to engage and roll on the wire cable 9 and being preferably curved to give a smooth rolling action in the turning down of the bed. In practice I have found a deflecting plate of semicircular shape to operate satisfactorily. Means are also provided for guiding the inner or head end of the bed in such manner that when the bed is lowered it will be fully extended into the room, and when the bed is raised the outer face thereof will be substantially flush with the outside of the casing. Said guiding means consists of grooves or tracks 17 formed in the respective sides of the casing and pins 18 preferably provided with rollers 19 engaging in said grooves, said pins being located at or near the head end of the bed and near the outer face or front thereof. The part of the bed to which these pins are attached, said part being the lower head corner of the bed when the bed is lowered, is thereby constrained to move in a vertical path. The deflecting or lifting plate 16 is secured to the bed frame at a distance from this corner or

away from said corner toward the foot of the bed, so that when the bed is lowered or turned down this plate will move forwardly or outwardly, and the cable passing over the same is thereby pulled forwardly and outwardly as well as bent over the periphery of the plate. By reason of the bending of the cable and of the deflection or pulling thereon outwardly away from the vertical, the cable exerts a lifting action on the head end of the bed as the bed is turned down. At its outer end the bed frame has legs 20 pivoted at 21 to the bed frame, which legs swing down onto the floor when the bed is lowered and fold down against the bed front when the bed is raised.

A sub head board 23 is attached by bolts 24 to the head brackets 6, and when the bed is fully raised, the inner end of said sub head board may rest on the floor 25 of the recess, the outer end of the bed, however, being preferably supported at such time by the cable means 9. The main head board 26 is hinged at 27 to said sub head board so as to buckle or fold up toward the bed, and the upper end of said main head board is connected by toggle links 28, 29 to the supporting frame, one end of said toggle links being pivoted to the head board at 30 and the other end to the fixed frame or casing at 31 in such manner that as the bed turns downwardly and the sub head board rises, the main head board rising therewith folds up the toggle links 28, 29, and the said toggle links thereby are caused to guide or shove the upper end of the head board forwardly until it comes to rest against a fixed stop 32 at each side of the recess. The hinges 27 are provided with springs 33 so as to tend to hold the main head board forwardly and insure that the toggle links 28, 29 will not cross the dead center of the pivoted connection 34 and will always be in position for operation. Stop lugs 40 may also be provided on the toggle links to hold them from passing too far.

The mattress indicated at 35 is held in place by a mattress clamp 36, slidably and adjustably mounted in the usual friction clamp 37 and bent at right angles to engage over the edge of the mattress.

In connection with the above described folding bed, I preferably provide means for ventilating the bed clothing, such means consisting of arms 38 slidably mounted in friction clamps 39 similarly to the usual mattress clamps and having their outer portions zigzagged or bent backward and forward to form a plurality of spring clip portions adapted for the insertion and retention of the bed clothing therein.

41 designates the foot board.

When the bed is folded up and occupies the position shown in Fig. 1, the front thereof comes nearly or substantially in the plane

of the wall or front of the frame, the bottom of the bed front extending to the floor and the top thereof to the top of the opening in the frame, and the back face of the front member coming to rest against the stop 32 at the sides and top of the supporting frame 1, in which position the bed is supported partly by the suspension cables 9 and partly by its rear edge resting on the floor of the recess. The head board is concealed back of the bed frame and is folded down into the rear part of the recess. When desired to use the bed, the upper portion thereof is pulled forward and outward and swings downward to the position shown in Fig. 2. In this operation the cables 9 wind up on the deflector plates 11, or conversely, the said plates wind up on said cables, so as to lift the inner or head end of the bed. At the same time the rollers 19 or pins 18 travel in the tracks 17 of the fixed frame, causing the inner or head end of the bed to travel in a substantially vertical path, so that the deflector plate 16 is thrown outward or forward and the cables 9 are still further deflected and shortened as regards their vertical reach, the lift of the bed being due to combined winding up and outward throw of the deflector plates and cables. As the bed frame turns down in this manner, the legs 20 swing downwardly to vertical position and come to rest on the floor to support the outer end of the bed. The head board is pushed up by the swinging upward of the top of the sub head board, and the toggle links 28, 29 are thereby folded from the position shown in Fig. 1 to the position shown in Fig. 2 with the result that the head board is pushed forward and comes to rest against the back of the fixed stop or bead 32 on the fixed frame 1.

When the ventilating or bed-clothes rack devices or holders are used, they are pushed outwardly to the full line position in Fig. 4, and the outer edges of the sheets, etc., are folded and inserted between the successive bends or parts of the holders. On then swinging the bed to vertical or closed position, shown in Fig. 1, the clothes will hang from the holders in sufficiently separated position to allow ventilation. When the bed is turned down the holders may be pulled from the full line to the dotted line position shown in Fig. 4, thereby drawing the bed clothes tight at the foot without removing them from the holders.

The bed above described swings forwardly in a longitudinal direction, but the invention is not limited to longitudinal movement, as it is equally applicable to the class of beds which swing from the side.

The construction of bed frame shown has certain advantages in strength and simplicity, the longitudinal rail members 3 being connected to the transverse or end rail members 4 by corner castings or brackets 5, 6,

which rise above the rails 3 so that the end rail members 4 are above the rails 3 when the bed is down. The side rails 42 of the bed spring 43 are connected to the cross rails 5 and serve to complete the frame.

What I claim is:—

1. A folding bed comprising a supporting means, flexible suspension means connected thereto, and a folding bed having its head end connected to and supported by such suspension means and provided with deflecting means to engage the suspension means and deflect the same to raise the head end of the bed when the bed is turned down.

15 2. A folding bed comprising supporting means, flexible suspension means connected thereto, a bed frame having its head end connected to and supported by such suspension means and provided with deflecting means 20 for engaging the flexible suspension means by rolling engagement to lift the head end of the bed when the bed is turned down.

3. A folding bed comprising a supporting frame, a bed frame, suspension means 25 connected to the supporting frame and to the bed frame to support the latter, and means on the bed frame operating on the suspension means to lift the adjacent part of the bed frame when the bed is turned down.

30 4. A supporting frame, a bed frame, flexible suspension means connected to the supporting frame and to the bed frame, and segment means on the bed frame engaging the flexible suspension means to lift the adjacent portion of the bed frame when the bed 35 is turned down.

5. A supporting frame provided with a track at each side, a bed frame having projecting parts engaging and guided in said 40 tracks, flexible suspension means connected to the supporting frame and to the bed to support the latter, and means on the bed frame engaging the suspension means to lift the adjacent portion of the bed when the bed 45 is turned down.

6. A supporting frame having a track at each side, a bed frame having projecting parts engaging and guided in said tracks, cables pivotally connected at their upper 50 ends to the sides of the supporting frame and secured at their lower ends to the bed frame, and segment means on the bed frame for engaging said cable to bend and roll on the same when the bed is turned down to lift 55 the adjacent portion of the bed.

7. A supporting frame having a track at each side, a bed frame having projecting parts engaging and guided in said tracks, cables pivotally connected at their upper 60 ends to the sides of the supporting frame and secured at their lower ends to the bed frame, and segment means on the bed frame for engaging said cable to bend and roll on

the same when the bed is turned down to lift the adjacent portion of the bed, the connection of the cable to the bed frame being adjustable. 65

8. The combination of a supporting frame and a bed frame mounted to move therein from the vertical to horizontal position, a 70 head board member pivotally connected to the bed frame, and toggle links connected to the head board and to the supporting frame to guide the upper end of the head board forwardly in its upward movement. 75

9. The combination of a supporting frame and a bed frame mounted to move therein from the vertical to horizontal position, a head board member pivotally connected to the bed frame, and toggle links connected to 80 the head board and to the supporting frame to guide the upper end of the head board forwardly in its upward movement, and fixed stop means on the supporting frame against which the head comes to rest in its 85 forward position.

10. The combination of a supporting frame and a bed frame mounted to move therein from the vertical to horizontal position, a head board member pivotally connected to the bed frame, and toggle links connected to 90 the head board and to the supporting frame to guide the upper end of the head board forwardly in its upward movement, and provided with means to hold the toggle links 95 from passing the dead center.

11. A supporting frame formed with a recess, a bed mounted in said recess to turn from the vertical to horizontal position, the mounting of said bed comprising flexible 100 suspension devices connected to the supporting frame and to the bed frame, deflecting means on the bed frame for engaging the suspension devices to lift the adjacent portion of the bed when the bed is turned down, 105 a sub head board on the inner end of the bed, a head board hinged to the upper end of the sub head board, and toggle links pivotally connected to one another to the head board and to the supporting frame to guide 110 the head board forward in its upward movement.

12. A folding bed frame, a support, suspension means connected to the frame and support, and means on the bed frame to act 115 on the suspension means when the bed is turned down to raise the adjacent part of the bed, thereby effecting a counter balancing action on the bed.

In testimony whereof, I have hereunto set 120 my hand at Los Angeles Cal. this 14th day of March 1906.

FREDERICK W. ABBOTT.

In presence of—

ARTHUR P. KNIGHT,
BELL HALL.