April 14, 1953 W. D. DRIVER 2,634,434

FOLDING BED

Filed June 29, 1950 3 Sheets-Sheet 1

Fig. 1.

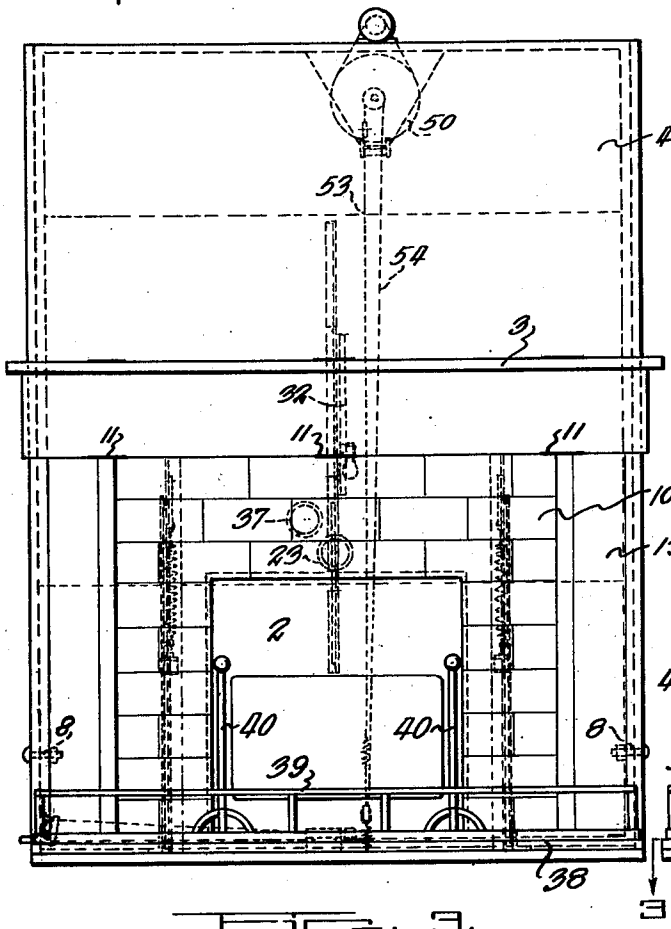


Fig. 2.

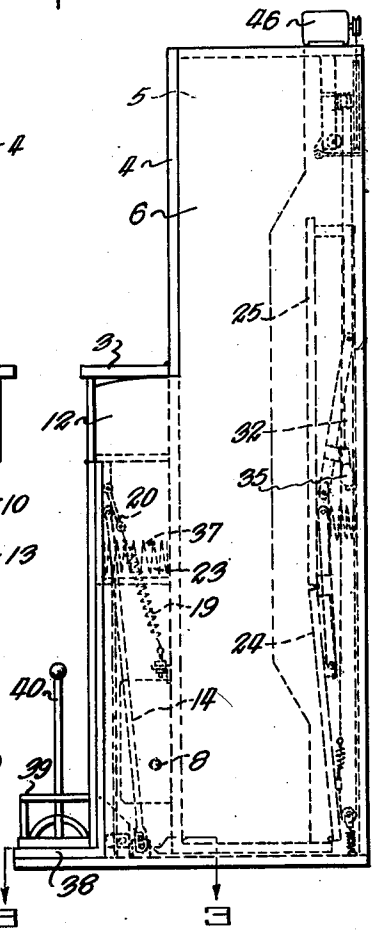
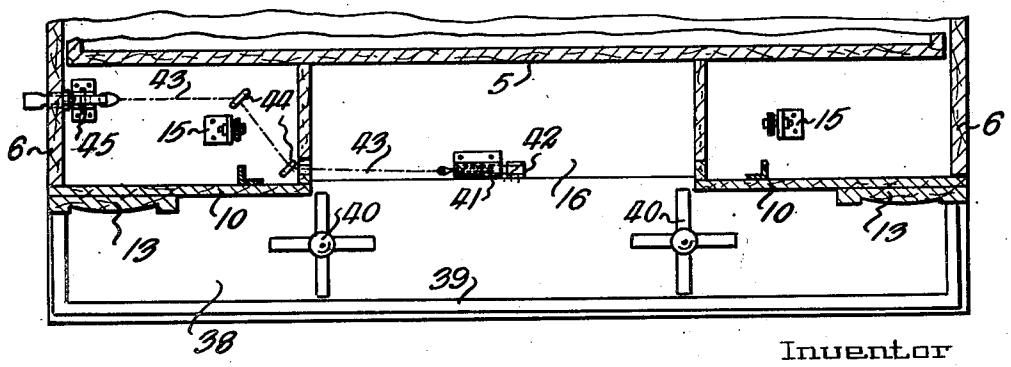


Fig. 3.



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Fig. 4.

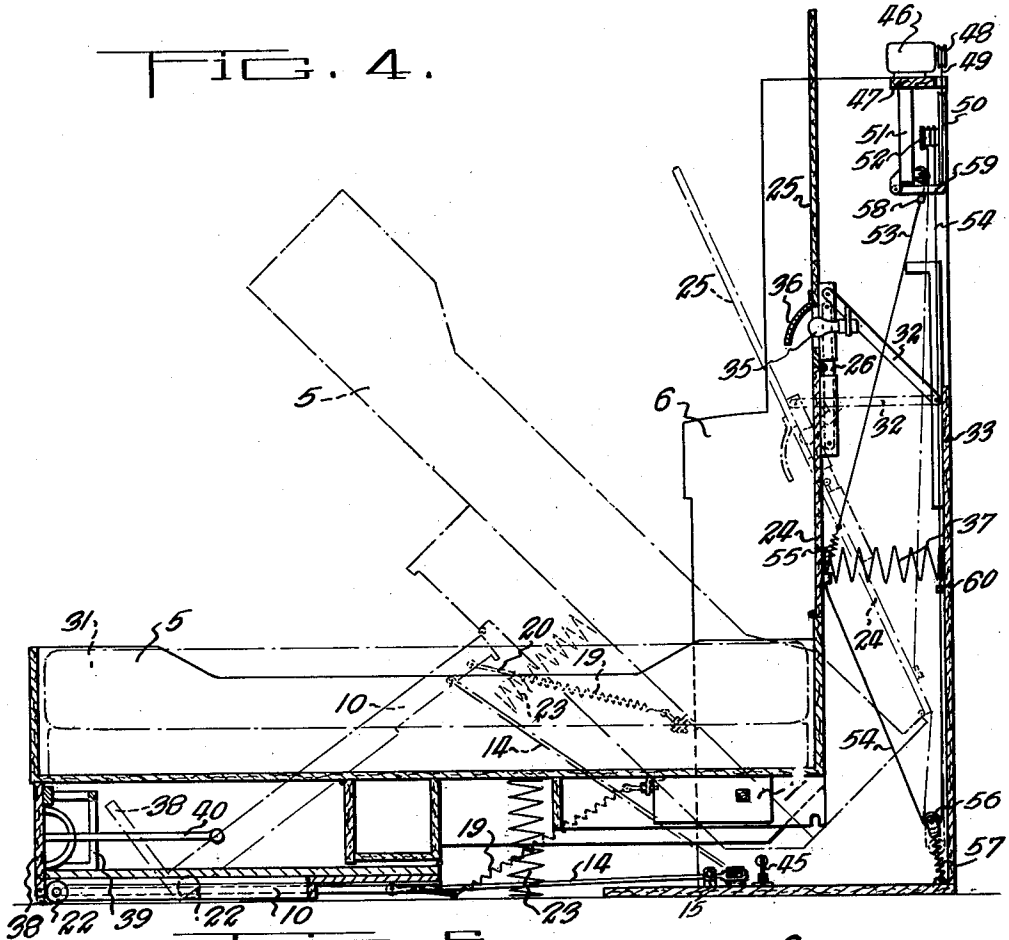
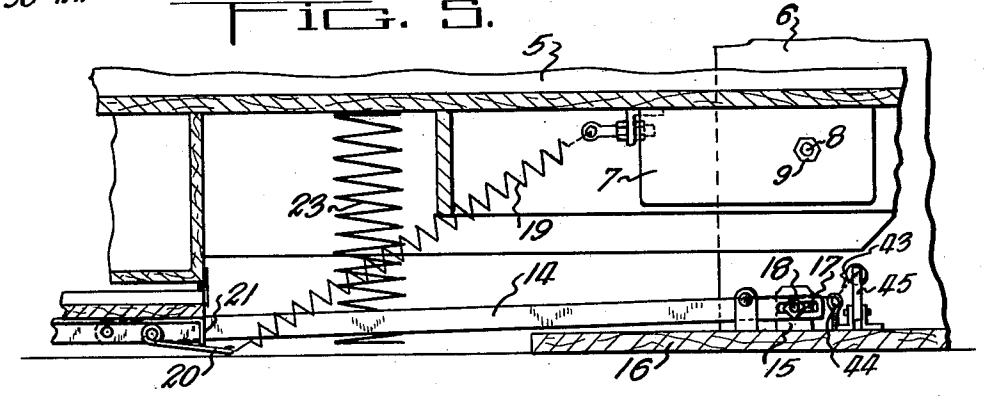


Fig. 5.



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Fig. 6.

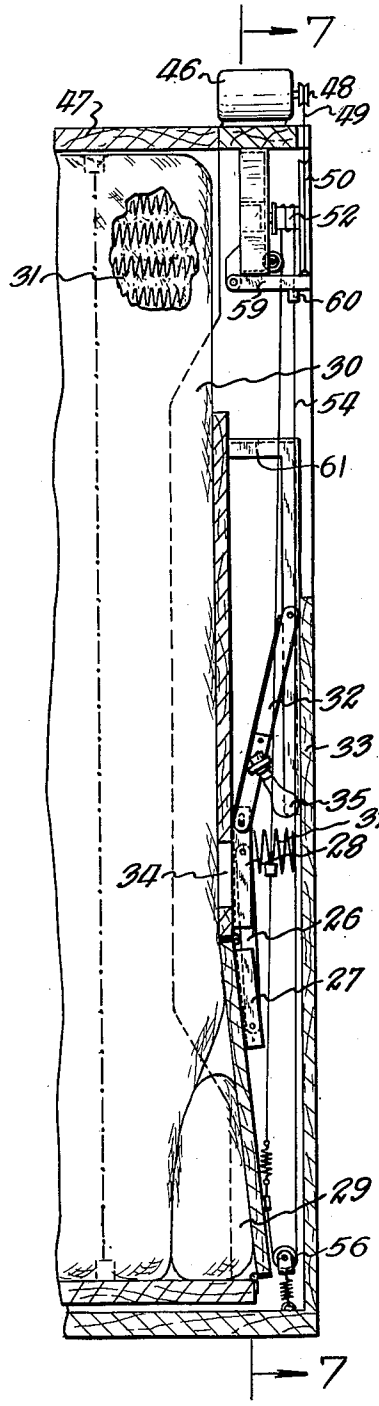
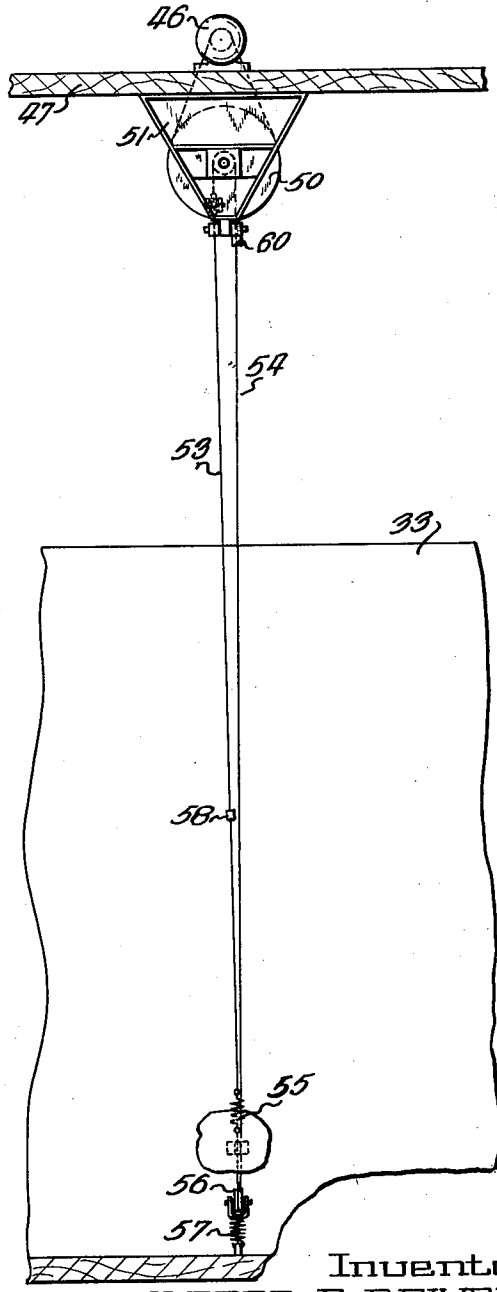


Fig. 7.



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UNITED STATES PATENT OFFICE

2,634,434

FOLDING BED

Wilfred D. Driver, Thessalon Township, Ontario, Canada

Application June 29, 1950, Serial No. 171,102

10 Claims. (Cl. 5—145)

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My invention relates to improvements in folding beds, and the object of the invention is to design a folding bed structure which when in the closed position simulates a fireplace, mantlepiece and chimney breast adapted to be normally positioned against a wall of the room in which the bed is contained, or set within a suitable recess wherein the chimney breast face of the structure is flush with the wall.

A further and particular object of the invention is to so design the structure that the mattress supporting frame and mattress resting thereon is vertically positioned behind the fireplace, mantlepiece and chimney breast face when the bed is in the closed position, the mattress supporting frame being pivotally attached between the lower portions of the sidewalls of the fireplace assembly and adapted to swing outwardly and downwardly when the bed is swung from the vertical to the horizontal position.

Another object of the invention is to mount the fireplace, mantlepiece and chimney breast face assembly of the structure upon the lower or outer face of the mattress supporting frame, and wherein the outer face portion of the fireplace assembly is hingedly secured to the under face of the mantle shelf structure to constitute a spring held supporting strut member having its lower edge rollable upon the floor to resiliently support the mattress frame when the frame is being swung into either the closed or the open position.

A further object of the invention is to so arrange my structure that the bed may be made up in the normal manner before being swung from the open horizontal position into the vertical closed position; a blanket retaining board being hingedly secured to the head of the bed for the purpose of pressing against the bed clothes and pillows when the bed is in the vertical closed position, to retain the bed clothes and pillows against falling out of place.

Another object of the invention is to so arrange the structure that the blanket retaining board is substantially vertical when the bed is open, and to provide a reading light in the board which projects upwardly through an orifice in the board, the reading light being so mounted that it is retracted when the bed is swung from the open to the closed position.

A further object of the invention is to provide several compressible and elongatable spiral springs which assist in the bed opening and closing operations.

Another object of the invention is to furnish, in certain cases, an electric motor actuated pull

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cable assembly which may be used for opening and closing the bed structure, and thus obviate any manual effort on the part of the person swinging the bed into either the open or closed position.

With the foregoing and other objects in view as shall hereinafter appear, my invention consists of a combined folding bed and simulated fireplace constructed and arranged all as hereinafter more particularly described and illustrated in the accompanying drawings in which:

Fig. 1 is a front elevational view of the device in the closed position and showing the faces of the fireplace, mantle shelf and chimney breast.

Fig. 2 is a side elevational view of the structure as shown in Fig. 1.

Fig. 3 is an enlarged horizontal sectional view taken through the line 3—3, Fig. 2.

Fig. 4 is a vertical cross-sectional view through the structure and showing the bed in the downwardly swung or open position.

Fig. 5 is an enlarged vertical cross-sectional view through a portion of the bed supporting structure when in the open position, and showing the bed strut member spring tensionally elongated under the action of the strut member in its forwardly extending horizontal position.

Fig. 6 is a further enlarged vertical cross-sectional view through the rear portion of the structure, and showing the made-up bed contained therein, and

Fig. 7 is a schematic view of the pull cable and electric motor assembly, being substantially taken through the line 7—7, Fig. 6.

Like characters of reference indicate corresponding parts in the different views of the drawings.

The underlying objective of my invention is to provide a structure of the character described wherein the under or forward face of the swingable assembly supporting the mattress is formed to simulate a fireplace, mantle shelf and chimney breast, so that when the bed is in the upwardly swung position it is not readily apparent to the casual observer that the structure is other than a fireplace and chimney breast; the chimney breast face, fireplace and mantle shelf portions of the structure being positioned underneath the bed when the bed is in the open horizontal position.

Referring to Figs. 1 and 2, 2 is the fireplace aperture, 3 the mantle shelf, and 4 the chimney breast. The mattress containing frame 5 is pivotally mounted between a pair of vertical side members 6 which form the sides of the struc-

ture assembly. The mattress frame 5 may be pivotally mounted in any suitable manner. In the drawings I show a pair of plates 7 which extend from the lower face of the mattress frame 5 and are swingably supported upon a pair of pins 8 protruding inwardly from the inner faces of the fireplace sides 6. The pins 8 are in the form of bolts having nuts 9 threaded thereon.

The fireplace aperture 2 is surrounded by the usual rectangular panel frame 10 which protrudes beyond the plane of the face of the chimney breast 4. The upper face of the frame 10 is swingably connected by hinges 11 to the bottom edge of an open topped receptacle 12 upon which the mantle shelf 3 is hingedly supported.

The panel frame 10 is faced with a pair of side panels 13. The frame 10 with its panels 13 has a dual purpose in providing a decorative effect for the fireplace face and also constituting a swingable mattress frame supporting strut which functions in supporting the mattress frame 5 when it is being swung from the vertical to the horizontal position, or vice versa, as will be apparent upon reference to Fig. 4.

A pair of swingable guide levers 14 are provided to constitute steadying braces between the structure and the swingable panel frame 10 when the bed is being swung. The guide levers 14 are pivotally connected at their forward ends to the upper corner portions of the rear face of the panel frame 10, and at their rear ends are pivotally mounted upon bosses 15 carried upon the upper face of the baseboard 16 of the structure. The rear ends of the levers 14 are formed with slots 17 through which pins 18 on the bosses 15 protrude to slide within the slots. By the provision of the pin receiving slots 17, the levers 14 are permitted to adjust themselves as the mattress frame 5 and panel frame 10 are swung about their respective centres when the bed is being opened or closed.

A pair of elongatable spiral springs 19 extend between the plates 7 and a pair of swingable arms 20 are mounted upon the upper corner portions of the rear face of the panel frame 10. When the bed is in the closed position the springs 19 extend upwardly and forwardly from the bottom of the vertical mattress frame 5 to the top of the vertical panel frame 10, as illustrated in Fig. 2.

When the bed is swung into the open position, as illustrated in Fig. 4, the panel frame 10 is swung outwardly, and the springs 19 are tensionally elongated and thus cushion the forward swinging movement of the panel frame 10 rolling upon the floor under the weight of the mattress frame 5 and contained mattress and bedding. Upon reference to Fig. 5 it will be seen that the arms 20 are so pivotally connected to the rear or under face of the panel frame 10, that when the bed is in the open position, the arms 20 rest against a stop 21 on the upper end of the panel frame 10, so that the arms are inclined downwardly whereby the lines of tension of the elongated springs 19 are so arranged that the springs do not tend by themselves to lift the foot of the bed from off the floor. The lower end of the panel frame 10 carries floor engaging rollers 22.

The under face of the mattress containing frame 5 constitutes in its upper portion the face of the chimney breast 4, and its lower portion which is positioned behind the fireplace panel frame 10 and side panels 13 when the bed is closed carries a compressible spiral spring 23

which presses against the rear face of the panel frame 10 when the bed is in the closed position for the purpose of assisting such frame 10 in swinging forwardly when the bed is being opened. During the opening operation the frame 10 swings clear of the outer end of the spring 23.

A blanket retaining board is hingedly secured to the upper edge of the head member of the mattress containing frame 5 and consists of two sections 24 and 25 hingedly connected together at their abutting edges. In order to retain the upper section 25 in alignment with the lower section 24 when the bed is in the open position, as illustrated in Fig. 4, a vertical brace member 26 extends along the back faces of the two sections. This brace is slidably and pivotally secured to a bracket 27 on the section 24 and a bracket 28 on the section 25 whereby the sections are permitted to swing out of the aligned position shown in Fig. 4 into the position shown in Fig. 6 wherein they press upon the pillow 29 and blankets 30 resting upon the mattress 31 in the mattress containing frame 5. A supporting lever 32 extends forwardly from the back 33 of the structure and is pivotally connected at its forward end to the bracket 28 on the blanket board section 25. When the bed is closed the lever 32 extends downwardly in the position shown in Fig. 2, and as the bed is being opened the lever swings upwardly in a clockwise direction as the blanket board rises, as shown in Fig. 4.

A bed light containing aperture 34 is formed within the blanket board section 25 and an electric light bulb 35 is mounted upon the lever 32 to project into the aperture 34 when the bed is in the open position and the blanket board extending forwardly from the head thereof, as shown in Fig. 4. When the bed is swung upwardly to be closed, the lever 32 swings downwardly in a counterclockwise direction whereby the light bulb 35 carried thereon moves from out of the aperture 34 to extend downwardly behind the blanket retaining board when the bed is closed, as illustrated in Fig. 2. The upper edge of the light containing aperture 34 carries a light deflecting shade 36. To hold the blanket board tightly against the bedding on the mattress a compressible spiral spring 37 is carried upon the inner face of the back 33 of the structure and bears against the lower section 24 of the blanket retaining board, whereby the board is pressed outwardly against the bedding when th bed is closed, as illustrated in Fig. 6.

The lower edge of the panel frame 10 carries a forwardly projecting hearth board 38 which rests upon the baseboard 16 and carries a fireplace fender and dogs 39 and 40. When the panel frame 10 is swung from the vertical position into the horizontal position when the bed is opened, the hearth board 38 forms the support for the foot end of the bed, as illustrated in Fig. 4.

When the bed is in the closed position, as illustrated in Figs. 1 and 2, the panel frame 10 is retained against forward swinging movement under the influence of the spring 23, by a bolt 41 which is mounted upon the hearth board 38 to engage a bolt eye 42 carried upon the baseboard 16. The bolt is spring held in the engaging position and is retracted by means of a pull cable 43 extending through guide eyes 44 to a foot actuated plunger 45, whereby actuation of the plunger 45 by the foot of the operator withdraws the bolt 41 from the bolt eye 42 to

release the panel frame 10 for forward swinging movement in lowering the bed.

If it is desired to manipulate the device by power means rather than manually, I furnish an electric motor and pull cable mechanism. An electric motor 46 is mounted upon a top board 47 extending between the upper edges of the side members 6 and carries a pulley 48 which is connected by a belt 49 to a pulley 50 freely mounted upon a bracket 51 secured underneath the top board 47. The pulley 50 has a drum 52 concentrically attached to its outer face, and a pair of cables 53 and 54 are wound oppositely to each other upon the drum.

The free end of the cable 53 is attached to the end of a spiral spring 55 secured to the back of the blanket retaining board section 24, the spring being provided as a safety feature to prevent undue tensioning of the cable. The free end of the cable 54 is passed over a pulley 56 positioned at the base of the structure back 33 and is attached to the section 24 of the blanket retaining board underneath the point of attachment of the spring 55. The pulley 56 hangs upon the cable 54 and is carried by a cable tensioning spiral spring 57 extending upwardly from the rear edge of the baseboard 16. The pulley 50 is of a much greater diameter than the pulley 48 on the motor 46 whereby the pulley 50 will rotate at a much slower speed than the motor pulley 48.

To lower the bed into the horizontal or open position, the motor is rotated in a direction whereby the rotation of the drum 52 pulls the cable 53 upwardly thus pulling the section 24 of the blanket retaining board upwardly whereby the mattress containing frame 5 is swung downwardly. In order to prevent undue strain upon the cable 53 when the bed reaches its vertical position, I position a clamp 58 upon the cable and provide an upwardly swingable brake bar 59 upon the lower end of the bracket 51 and which is adapted to bear against the rim of the pulley 50 in an upward thrust. The clamp 58 is so positioned upon the cable 53 that as the bed swings into its lowermost position, the clamp 58 engages the lower face of the brake bar 59 to swing such bar upwardly into braking engagement with the rim of the pulley 50, whereby the pulley 50 is braked to a standstill. The driving belt 49 between the motor pulley 48 and the pulley 50 is relatively slack so that when the pulley 50 is braked to a standstill the belt 49 will slip.

To raise the bed the motor 46 is rotated in the opposite direction whereby pull is exerted upon the cable 54 which draws the blanket retaining board section 24 downwardly to swing the mattress containing frame 5 upwardly into the closed position. The cable 54 carries a suitably positioned clamp 60 which moves into engagement with the brake bar 59 to stop rotation of the pulley 50 as previously described. When the bed is in the folded position the upper end portion of the section 25 of the blanket retaining board rests against a shoulder piece 61 carried upon the back 33 of the structure.

To provide a completely automatic actuation of the bed, a controlling switch for the electric motor 46 may be incorporated within the foot operated plunger 45 wherein actuation of the plunger to release the bolt 41 closes the switch to actuate the motor. Upon release of the bolt 41 the panel frame 10 is swung forwardly under the influence of the compressed spring 23 whereby its lower edge rolls over the floor upon the rollers 22, as illustrated in dotted lines in Fig. 4; the downward movement of the mattress containing frame 5 causing the panel frame 10 to swing forwardly against the resilience of the spiral springs 19 after the panel frame 10 passes out of contact with the end of the released compressed spring 23.

When the mattress containing frame 5 is raised either manually or through the operation of the electric motor 46, the panel frame 10 is withdrawn under the tension of the spiral springs 19, a slight manual pressure being only required to return the panel frame into the closed position as shown in Figs. 1 and 2.

From the foregoing description it will be apparent that I have devised a folding bed structure particularly designed for placing against a wall or in a recess with the chimney breast flush with the wall and in which the face of such structure may be designed to simulate a fireplace, mantlepiece and chimney breast without interfering with the operation of the folding mechanism, and wherein I utilize the panel frame of the fireplace as a strut for supporting the mattress containing frame when it is being swung and when it is in the lowered position.

Although I have shown and described a particular embodiment of my invention, it is to be understood that I may make such changes and alterations as I may from time to time deem necessary, without departing from the spirit of my invention as set forth in the appended claims.

What I claim as my invention is:

1. A folding bed structure of the character described comprising a pair of stationary vertical spaced-apart side members, a mattress containing frame pivotally mounted at its head end between the side members and swingable from a vertical position between the side members to a horizontal position extending outwardly from the side members, a strut extending longitudinally of the bottom of the mattress containing frame and hingedly secured to the frame intermediately of the length of the frame and having its free end swingable from one end of the frame to the other, said strut depending downwardly from the mattress frame in parallel relation to the lower portion of the mattress frame when the frame is in the vertical position and extending forwardly in parallel relation to the upper portion of the mattress frame when the frame is in the horizontal position, a bed supporting member projecting from the free end of the strut at right-angles thereto and upon which the foot of the mattress containing frame rests when the frame is in the horizontal position, floor engaging rollers upon the free end of the strut, resilient means governing the swinging movement of the strut in relation to the mattress containing frame, a blanket retaining board hingedly secured to the upper edge of the head member of the mattress containing frame, a back board extending between the rear edges of the two side members, a compressible spring positioned between the blanket retaining board and the back board, and a vertically swingable lever for holding the blanket retaining board in a substantially vertical position when the bed is either opened or closed, said lever being pivotally connected to the back board and pivotally connected to the blanket retaining board.

2. A folding bed structure of the character described comprising a pair of stationary vertical spaced-apart side members, a mattress containing frame pivotally mounted at its head end be-

tween the side members and swingable from a vertical position between the side members to a horizontal position extending outwardly from the side members, a strut extending longitudinally of the bottom of the mattress containing frame and hingedly secured to the frame intermediately of the length of the frame and having its free end swingable from one end of the frame to the other, said strut depending downwardly from the mattress frame in parallel relation to the lower portion of the mattress frame when the frame is in the vertical position and extending forwardly in parallel relation to the upper portion of the mattress frame when the frame is in the horizontal position, a bed supporting member projecting from the free end of the strut at right-angles thereto and upon which the foot of the mattress containing frame rests when the frame is in the horizontal position, floor engaging rollers upon the free end of the strut, a strut swinging elongatable spiral spring extending between the strut and the head end of the mattress containing frame, a swingable arm mounted upon the upper portion of the rear face of the strut and to the free end of which the spiral spring is attached, and a stop protruding downwardly from the upper edge of the rear face of the strut and against which the swingable arm rests when the strut is in the forwardly extending position and whereby the strut is inclined in relation to the longitudinal axis of the spiral spring.

3. A folding bed structure as claimed in claim 2, wherein the mattress containing frame is pivotally mounted between the side members intermediately of the length of the frame and in the vicinity of the head end of the frame, a blanket retaining board hingedly secured to the upper edge of the head member of the mattress containing frame and formed of lower and upper sections hingedly connected at their adjacent edges, a back board extending between the rear edges of the two side members, a vertically swingable lever for holding the blanket retaining board in a substantially vertical position when the bed is either opened or closed, said lever being pivotally connected to the back board and pivotally connected to the upper section of the blanket retaining board, and a compressible coiled spring interposed between the front face of the back board and blanket retaining board.

4. A folding bed structure as claimed in claim 2, wherein the mattress containing frame is pivotally mounted between the side members intermediately of the length of the frame and in the vicinity of the head end of the frame, a blanket retaining board hingedly secured to the upper edge of the head member of the mattress containing frame and formed of lower and upper sections hingedly connected at their adjacent edges, a back board extending between the rear edges of the two side members, a vertically swingable lever for holding the blanket retaining board in a substantially vertical position when the bed is either opened or closed, said lever being pivotally connected to the back board and pivotally connected to the upper section of the blanket retaining board, a compressible coiled spring interposed between the front face of the back board and blanket retaining board, the upper section of the blanket retaining board having an electric light bulb receiving orifice therein, and an electric light bulb mounted upon the vertically swingable lever and positioned to project into the orifice when the lever is in its uppermost position.

5. A folding bed structure as claimed in claim 2, wherein the base of the mattress containing frame is formed to simulate a fireplace and chimney breast, and wherein the panel frame surrounding the fireplace opening is hingedly mounted and constitutes the swingable strut.

6. A folding bed structure of the character described comprising a pair of stationary vertical spaced-apart side members, a mattress containing frame pivotally mounted at its head end between the side members and swingable from a vertical position between the side members to a horizontal position extending outwardly from the side members, a strut extending longitudinally of the bottom of the mattress containing frame and hingedly secured to the frame intermediately of the length of the frame and having its free end swingable from one end of the frame to the other, said strut depending downwardly from the mattress frame in parallel relation to the lower portion of the mattress frame when the frame is in the vertical position and extending forwardly in parallel relation to the upper portion of the mattress frame when the frame is in the horizontal position, a bed supporting member projecting from the free end of the strut at right-angles thereto and upon which the foot of the mattress containing frame rests when the frame is in the horizontal position, floor engaging rollers upon the free end of the strut, a blanket retaining board hingedly secured to the upper edge of the head member of the mattress containing frame, a back board extending between the rear edges of the two side members, a strut swinging elongatable spiral spring extending between the strut and the head end of the mattress containing frame, a swingable arm mounted upon the upper portion of the rear face of the strut and to the free end of which the spiral spring is attached, and a stop protruding downwardly from the upper edge of the rear face of the strut and against which the swingable arm rests when the strut is in the forwardly extending position and whereby the strut is inclined in relation to the longitudinal axis of the spiral spring.

7. A folding bed structure as claimed in claim 1, wherein the swinging bed is power actuated by a reversible motor carried by the upper ends of the vertical side members, a motor driven cable drum, and a pair of oppositely wound cables extending from the drum and connected to the blanket retaining board, one cable being arranged to pull the board upwardly and the mattress containing frame downwardly and the other cable arranged to pull the board downwardly and the mattress containing frame upwardly under the influence of the rotated drum.

8. A folding bed structure as claimed in claim 1, wherein the swinging bed is power actuated by a reversible motor carried by the upper ends of the vertical side members a motor driven belt pulley, a cable drum on the motor concentrically attached to the belt pulley, a pair of oppositely wound cables extending from the drum and connected to the blanket retaining board, one cable being arranged to pull the board upwardly and the mattress containing frame downwardly and the other cable arranged to pull the board downwardly and the mattress containing frame upwardly under the influence of the rotated drum, a belt pulley and cable drum supporting bracket carried by the upper ends of the side members and a brake bar swingably mounted on the bracket to engage the rim of the belt pulley and alongside which the cables pass, and adjustable clamps

upon the cables provided to impinge against and swing the bar into braking engagement with the rim of the belt pulley.

9. A folding bed structure of the character described comprising a pair of stationary vertical spaced-apart side members, a mattress containing frame pivotally mounted at its head end between the side members and swingable from a vertical position between the side members to a horizontal position extending outwardly from the side members, a strut extending longitudinally of the bottom of the mattress containing frame and hingedly secured to the frame intermediately of the length of the frame and having its free end swingable from one end of the frame to the other, said strut depending downwardly from the mattress frame in parallel relation to the lower portion of the mattress frame when the frame is in the vertical position and extending forwardly in parallel relation to the upper portion of the mattress frame when the frame is in the horizontal position, a bed supporting member projecting from the free end of the strut at right-angles thereto and upon which the foot of the mattress containing frame rests when the frame is in the horizontal position, floor engaging rollers upon the free end of the strut, resilient means governing the swinging movement of the strut in relation to the mattress containing frame, the mattress containing frame being pivotally mounted between the side members intermediately of the length of the frame and in the vicinity of the head end of the frame, a blanket retaining board hingedly secured to the upper edge of the head member of the mattress containing frame and formed of lower and upper sections hingedly connected at their adjacent edges, a back board extending between the rear edges of the two side members, a vertically swingable lever for holding the blanket retaining board in a substantially vertical position when the bed is either opened or closed, said lever being pivotally connected to the back board and pivotally connected to the upper section of the blanket retaining board, and a compressible coiled spring interposed between the front face of the back board and blanket retaining board.

10. A folding bed structure of the character described comprising a pair of stationary vertical spaced-apart side members, a mattress containing frame pivotally mounted at its head end between the side members and swingable from a vertical position between the side members to a horizontal position extending outwardly from the side members, a strut extending longitudinally of the bottom of the mattress containing frame and hingedly secured to the frame intermediately of the length of the frame and having its free end swingable from one end of the frame to the other, said strut depending downwardly from the mattress frame in parallel relation to the lower portion of the mattress frame when the frame is in the vertical position and extending forwardly in parallel relation to the upper portion of the mattress frame when the frame is in the horizontal position, a bed supporting member projecting from the free end of the strut at right-angles thereto and upon which the foot of the mattress containing frame rests when the frame is in the horizontal position, floor engaging rollers upon the free end of the strut, resilient means governing the swinging movement of the strut in relation to the mattress containing frame, the mattress containing frame being pivotally mounted between the side members intermediately of the length of the frame and in the vicinity of the head end of the frame, a blanket retaining board hingedly secured to the upper edge of the head member of the mattress containing frame and formed of lower and upper sections hingedly connected at their adjacent edges, a back board extending between the rear edges of the two side members, a vertically swingable lever for holding the blanket retaining board in a substantially vertical position when the bed is either opened or closed, said lever being pivotally connected to the back board and pivotally connected to the upper section of the blanket retaining board, a compressible coiled spring interposed between the front face of the back board and blanket retaining board, the upper section of the blanket retaining board having an electric light bulb receiving orifice therein, and an electric light bulb mounted upon the vertical swingable lever and positioned to project into the orifice when the lever is in its uppermost position.

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