No. 637,670. Patented Nov. 21, 1899.

G. W. SANOR.

FOLDING BED.

(Application filed Jan. 18, 1899.)

(No Model.) 3 Sheets—Sheet 1.

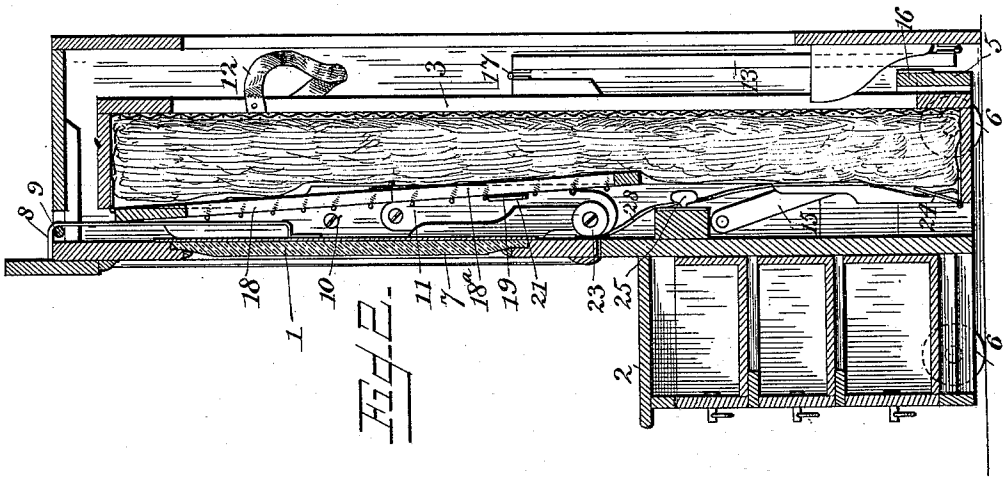
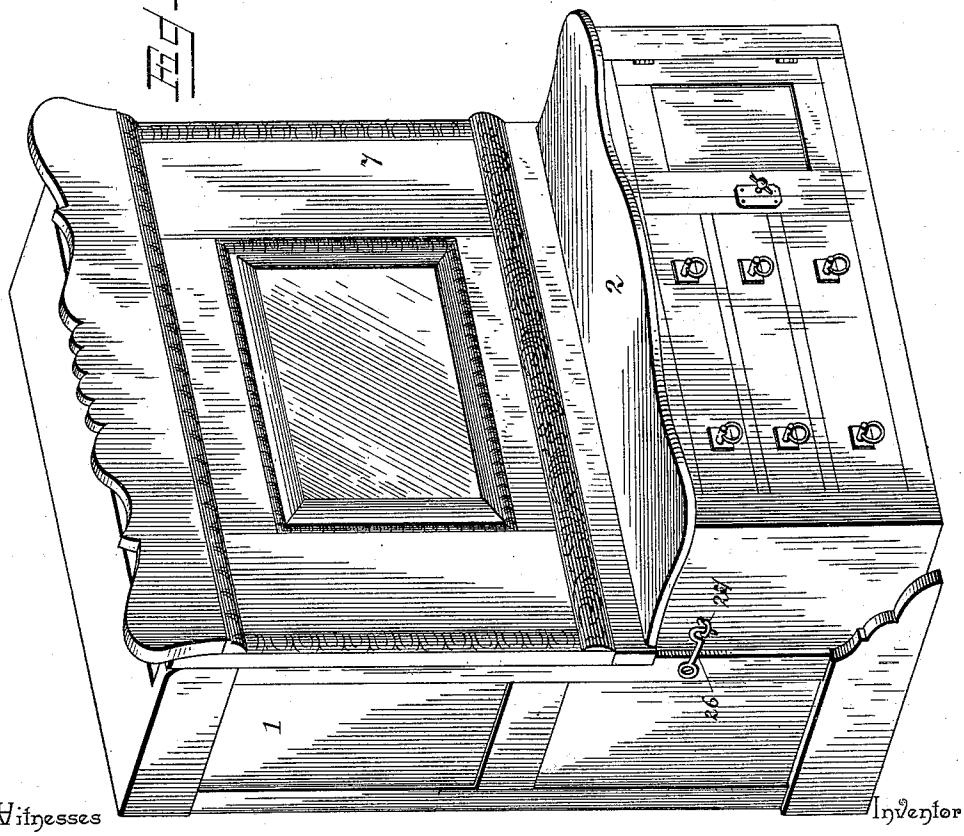


Fig. 2.

Fig. 1.



Witnesses
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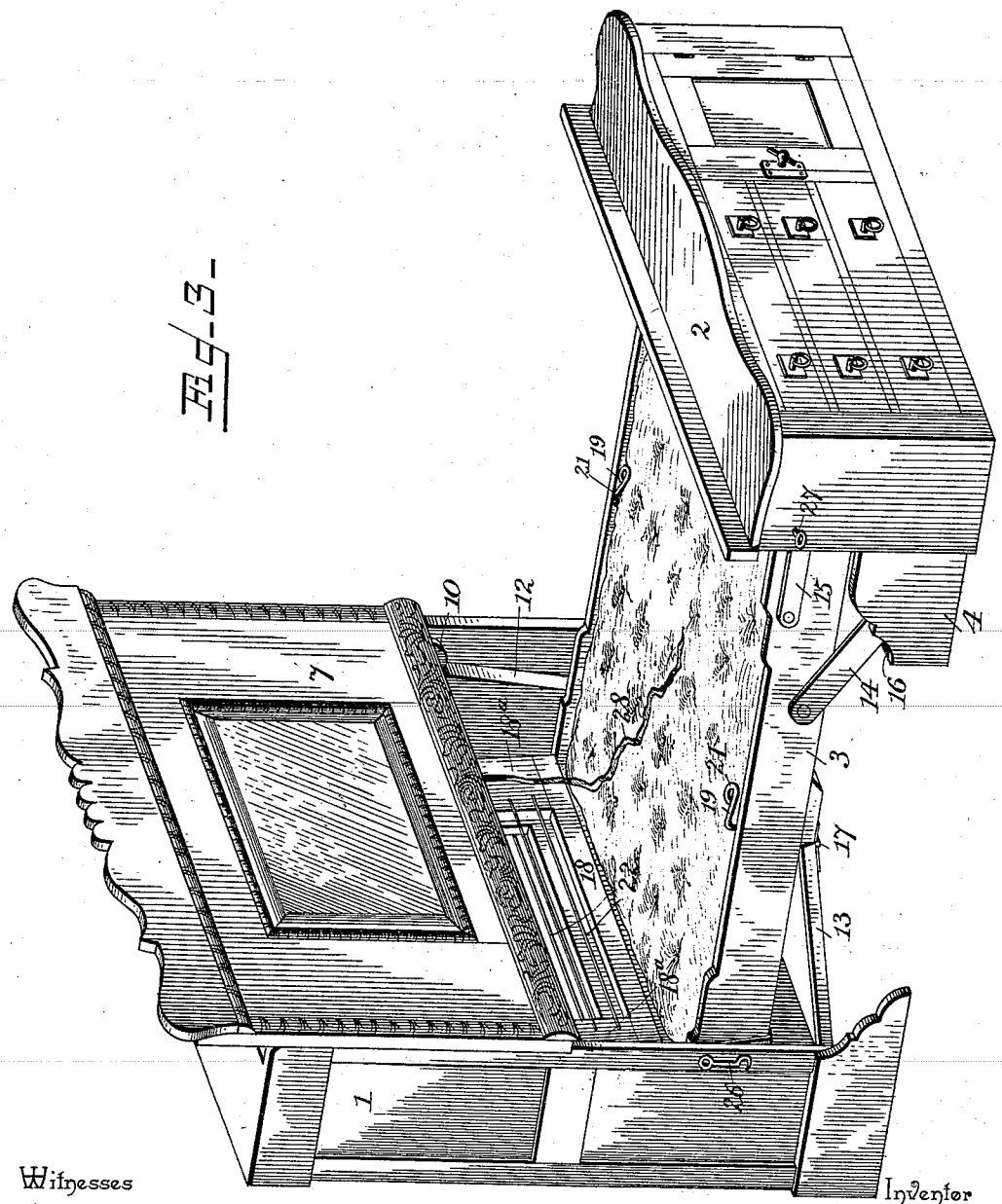
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3 Sheets—Sheet 2.

Fig. 3.



Witnesses

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(No Model.) 3 Sheets—Sheet 3.

Fig. 5.

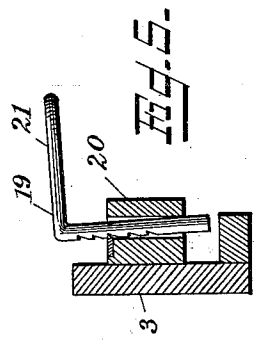


Fig. 4.

Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE W. SANOR, OF PACIFIC, MISSOURI.

FOLDING BED.

SPECIFICATION forming part of Letters Patent No. 637,670, dated November 21, 1899.

Application filed January 18, 1899. Serial No. 702,559. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. SANOR, a citizen of the United States, residing at Pacific, in the county of Franklin and State of Missouri, have invented a new and useful Folding Bed, of which the following is a specification.

My invention relates to folding beds, and has for its object to provide a springless device of this class wherein the bed-frame is approximately counterbalanced to facilitate the extension and folding thereof, and also to provide in connection with the bed a dresser, of which the mirror and frame form the front of the stationary or receiving case and also constitute a counterbalancing element.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a perspective view of a combined folding bed and dresser constructed in accordance with my invention, the same being shown folded or closed. Fig. 2 is a vertical sectional view of the same. Fig. 3 is a perspective view of the device in its open or operative position. Fig. 4 is a central vertical section thereof as shown in Fig. 3 and indicating in dotted lines the positions of the parts in the first step of closing the apparatus. Fig. 5 is a detail sectional view of the clutch or holding device for locking the hinged headboard in its depressed position.

Similar reference characters indicate corresponding parts in all the figures of the drawings.

The device embodying my present invention consists of an improvement upon the construction shown and described in a former patent, No. 553,968, granted to me on February 4, 1896; and, as in said former patent, the device consists, essentially, of a stationary or receiving case 1, a movable or dresser case 2, and a bed-frame 3, supported between and terminally connected with said stationary and movable cases and adapted for either upright or horizontal position, according to the relative positions of the cases. To facilitate the movement of the case 2 toward and from the stationary case and at the same time afford a stable support for the foot end of the bed-frame, I provide the movable case with a rearward extension having sides 4 and a connecting cross-bar 5, supporting-rollers 6 being housed in the case and being preferably of large diameter in order to traverse the surface of the floor or carpet without undue resistance and without the risk of causing injury thereto. The movable or dresser case may be provided with suitable receptacles, such as drawers, cupboards, &c.

When the stationary and movable cases are in their closed relative positions, the lower portion of the front of the stationary case is closed by the movable case, and arranged to close the upper portion of the front of the stationary case is a movable front section 7, consisting in the construction illustrated of a mirror and frame, which may be made of any suitable ornamental configuration, and this movable front section is provided near its upper end with vertical slides 8, consisting of stirrups engaged with a guide-rod 9, connecting the side walls of the stationary or receiving case. These slide-stirrups allow both vertical sliding and swinging movement of the front section during the operation of the apparatus. Also mounted within and upon the side walls of the stationary or receiving case are intermediately-fulcrumed levers 10, of which the front arms are preferably connected by links 11 with the movable front or mirror section, near its lower edge, and of which the rear arms are flexibly connected with the head end of the bed-frame by means of stirrups or cords 12. Inasmuch as the strain upon the links 11 is always tensile it will be understood that other swinging or flexible means of connection may be employed between the lower edge of the front or mirror section and the front arms of the balanced levers 10, the relative lengths of the arms of said levers being such that the weights of the front or mirror section and the head end of the bed approximately counterbalance each other. Furthermore, it will be seen that by reason of the attachment of said front-wall section and the head end of the bed-frame to opposite ends of the levers 10 one of said elements is elevated when the other is depressed, whereby when the head end of the bed is elevated to approach a folded position the front-wall section is allowed to descend

to meet the top of the movable or dresser case, and while the head end of the bed is being lowered or depressed to an operative position in extending or opening the bed the front-wall section is elevated and swung forward at its lower edge, and when the bed reaches a fully-open position said front section swings back to a vertical position, but still remains elevated to space its lower edge sufficiently above the plane of the bed-frame to allow access to all portions of the surface of the bed.

Connecting the bed-frame with the stationary or receiving case are arms or links 13, hinged or otherwise pivotally mounted at their rear ends to the back of the case near its lower edge and similarly mounted at their front ends to the bed-frame approximately at the center of its length, and also connecting the bed-frame with the movable or dresser case are arms or links 14, pivotally mounted at their front ends to the inner sides of the walls 4 of said movable frame extension and at their rear ends to the sides of the bed-frame at a distance of approximately one-third of the length of said frame from the foot end. Said links 13 and 14 are hereinafter referred to as "head" and "foot" or "rear" and "front" connecting-links. Also guiding-links 15 connect the bed-frame, near its foot end, with the movable or dresser case approximately in the plane of the upper side of the bed-frame, whereby when the parts are in their normal positions the guiding-links are approximately horizontal. The links 15 are hereinafter referred to as "guiding-links" to distinguish from the connecting-links 13 and 14. The front or foot connecting-links 14 bear at intermediate points upon rests 16, formed by the upper edge of the cross-bar 5, or, preferably, as shown in the drawings, by plates 16, secured to said cross-bar, and these rests are so arranged in central relation with the pivoted front end of the connecting-links that the latter are inclined rearward and upward toward their points of attachment to the bed-frame when the latter is in its horizontal or normal position. Also the rear or head connecting-links 13 incline forward and upward toward their points of attachment to the bed-frame. The function of the guiding-links 15 is to hold the foot end of the bed out of contact with the back of the movable or dresser case during the depression of said foot end of the frame in the first portion of the movement of closing or folding the bed and while the bed-frame is tilted upon the pivot 17, as indicated by the dotted lines in Fig. 4.

Mounted upon the head-rest of the bed-frame is a folding headboard 18, preferably of sectional construction, with an intermediate hinge-joint whereby the sections of the same may be folded to occupy parallel contiguous planes when arranged in an upright position at the head end of the bed-frame to perform the ordinary function of preventing the pillows from becoming displaced rearwardly. This folding headboard, however, is adapted to be extended forward over the bed-frame to hold the bedding in the proper position during the folding of the device, and to maintain the frame in this holding position I employ catches 19, consisting of notched or serrated stems, fitted in sockets 20, having detents to engage the notches or serrations, the stems of said catches being extended laterally to form bearing-arms 21, which engage the upper or outer surface of the headboard. I preferably construct this headboard to form an open frame having parallel side bars 18^a, which extend parallel with the sides of the bed-frame and are connected by cross-wires or any suitable filling, as shown at 22. This headboard, however, performs another function in connection with the apparatus described than that of maintaining the bedding in position, and it performs said further function by reason of the necessity of inclining the front-wall section of the stationary or receiving case for swinging the lower edge of said section forward during the operations of folding and extending the bed-frame. The front-wall section is provided at its lower edge with guide rollers or travelers 23, which are adapted to traverse the parallel side bars 18^a of the headboard during the said operations, whereby the resistance necessary to be overcome in folding or extending the bed is reduced to the minimum.

In connection with the foot end of the bed-frame I employ a locking device for preventing the depression thereof when the parts are in their normal positions, and in the construction illustrated said locking device consists of a latch or tongue 24, having a slot to engage a turn-button 25; but it will be understood that this is only one of various forms of locks which may be used in this relation to insure the desired relative positions of the foot end of the bed-frame and the movable or dresser case when the apparatus is in its normal or operative position. Also suitable catches, such as a hook 26 and eye 27, may be employed for securing the movable or dresser case in its closed position with relation to the stationary or receiving case.

With the members of the apparatus in the closed positions indicated in Figs. 1 and 2 the only operation necessary to open the bed after the movable or dresser case has been disengaged from the stationary or receiving case is to apply a slight forward impulse to the movable case to draw the foot end of the bed-frame forward until the head connecting-links 13 are inclined forward. When the device is folded, these connecting-links occupy vertical positions parallel with the bed-frame, and as the weight of the bed-frame is carried in a great measure by these links 13 it will be seen that there is no tendency for such weight to advance the movable or dresser case accidentally. When the movable or dresser case has been advanced, however, a sufficient distance to incline the links 13, the weight of the bed-frame will then tend to ad-

vance the movable case; but such tendency will be resisted to a certain extent by the rearward pressure of the lower edge of the movable front-wall section. When, however, the parts reach the dotted position indicated in Fig. 4, to throw the weight of the head end of the bed-frame upon the rear arms of the balanced levers 10 the downward movement of said head end of the bed-frame will be counterbalanced by the weight of the front-wall section, after which the completion of the extension of the bed may be accomplished with but slight exertion upon the part of the operator and without the risk of jar when the parts reach their extended positions.

Attached to the lower free edge of the front-wall section is a cord or tape 28 of sufficient length to extend to a point within reach of an operator standing in front of the movable or dresser case, and when it is desired to fold the bed (the foot end thereof having been disengaged from the locking device employed for connecting the same to the movable case and the headboard having been secured in position to hold the bedding) the free end of the tape is grasped and drawn forward to swing the lower edge of the front-wall section away from the stationary or receiving case. This movement of the front-wall section is imparted to the levers 10 to move the latter from their former vertical position to a forwardly-inclined position, whereupon a slight rearward pressure against the movable or dresser case will cause the elevation of the head end of the bed-frame and the corresponding depression of the front-wall section to the relative position indicated in dotted lines in Fig. 4. From this point the completion of the folding operation may be accomplished by rearward pressure upon the movable or dresser case, and owing to the approximately balanced relation of the parts but slight effort is necessary upon the part of the operator, and should this pressure be relaxed or uninterrupted the only result will be the comparatively slow return of the parts to the position indicated in dotted lines in Fig. 4, where the bed-frame is balanced by the front-wall section.

From the above description it will be seen that I have entirely avoided the use of springs in the construction of my improved folding bed and have also avoided the use of independent weights or other counterbalancing means which do not form essential features of the apparatus. The front-wall section, which in the construction illustrated constitutes the mirror of the dressing-case, performs the function of a counterbalance for the bed-frame, and as the movement of this front-wall section must be accomplished under any circumstances in order to move it sufficiently from the plane of the bed-frame to avoid inconveniencing the occupant of the bed, and as the elevation of this wall-section must be accomplished during the depression of the bed-frame, and vice versa, I have utilized the weight of the front-wall section to counterbalance that of the bed-frame, whereby a single set of devices not complicated by auxiliary means are sufficient to insure the desired relative disposition of the parts without necessitating undue effort by the operator.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having described my invention, what I claim is—

1. In a folding bed, the combination of a stationary case having a movable wall-section, a movable case adjustable relatively to the stationary case, a bed-frame connecting said cases, and connections between the bed-frame and said wall-section for causing simultaneous movement thereof, substantially as specified.

2. In a folding bed, the combination of a stationary case having a vertically-movable member, a movable case, a bed-frame connecting said cases, and connections between said bed-frame and movable member, for communicating motion from one to the other, substantially as specified.

3. In a folding bed, the combination of a stationary case having a vertically-movable member, a movable case, a bed-frame connecting said cases, and connections between the bed-frame and said movable member, whereby the latter counterbalances the head end of the former, substantially as specified.

4. In a folding bed, the combination of a stationary case, having a vertically-movable front-wall section, a movable case, a bed-frame connecting said cases, and connections between the front-wall section and the head end of the bed, whereby the latter is counterbalanced by the former, substantially as specified.

5. In a folding bed, the combination of a stationary or receiving case having a vertically-movable front-wall section consisting of a mirror and frame, a movable or dresser case adjustable toward and from the stationary case, a bed-frame connecting said cases, and connections between the front-wall section and the head end of the bed, whereby the latter is counterbalanced by the former, substantially as specified.

6. In a folding bed, the combination of a stationary case having a vertically-movable front-wall section, a movable case, a bed-frame connecting said cases and vertically movable at its head end, and connections between the head end of the bed-frame and said front-wall section, whereby motion in opposite directions is communicated from one to the other, substantially as specified.

7. In a folding bed, the combination of a stationary case having a vertically-movable front-wall section, a movable case adjustable toward and from the stationary case, a bed-frame connecting the cases, and connections,

including a balanced lever, between the head end of the bed-frame and said front-wall section, substantially as specified.

8. In a folding bed, the combination of a stationary case having a vertically-movable front-wall section, a movable case adjustable toward and from the stationary case, a bed-frame connecting said cases, a balanced lever mounted upon the stationary case, and flexible connections between the arms of said lever and the front-wall section and head end of the bed-frame, respectively, substantially as specified.

9. In a folding bed, the combination of a stationary case having a vertically-movable front-wall section, a movable case, a bed-frame having longitudinal surfaces, and connecting said cases to fold into the stationary case, and travelers on the said front-wall section for traversing said longitudinal surfaces on the bed-frame, substantially as specified.

10. In a folding bed, the combination of a stationary case having a movable front-wall section, a movable case, a bed-frame connecting said cases and adapted to fold within the stationary case, travelers carried by the front-wall section, a headboard carried by the bed-frame and hinged for forward extension to lie approximately parallel with the bed-frame, and adapted to be traversed by said travelers, and catches to hold the headboard in its extended position, substantially as specified.

11. In a folding bed, the combination of a stationary case having a movable front-wall section, a movable case, a bed-frame connecting said cases and adapted to fold within the stationary case, travelers carried by the front-wall section, and a folding headboard mounted upon the bed-frame for extension approximately parallel therewith to be traversed by said travelers, said headboard comprising foldably-connected sections, substantially as specified.

12. In a folding bed, the combination of a stationary case having a movable front-wall section, a movable case, a bed-frame connecting said cases and adapted to fold within the stationary case, travelers carried by the front-wall section, a folding headboard carried by the bed-frame for extension approximately parallel with the bed-frame to be traversed by said travelers, and means for securing the headboard in its forwardly-extended position, substantially as specified.

13. In a folding bed, the combination of a stationary case having a movable front-wall section, a movable case, a bed-frame connecting said cases and adapted to fold within the stationary case, travelers carried by the front-wall section, a folding headboard carried by the bed-frame for extension approximately parallel with the bed-frame to be traversed by said travelers, and means consisting of catches mounted upon the bed-frame, for securing the headboard in its extended position, substantially as specified.

14. In a folding bed, the combination of a stationary case having a movable front-wall section, a movable case, a bed-frame connecting said cases and adapted to fold within the stationary case, travelers carried by the front-wall section, a folding headboard carried by the bed-frame for extension approximately parallel with the bed-frame to be traversed by said travelers, and locking devices for securing the headboard in its extended position, the same consisting of catches having serrated shanks, and sockets, to receive said shanks, provided with detents to engage the serrations thereof, substantially as specified.

15. In a folding bed, the combination of a stationary case having a movable front-wall section, a movable case, a bed-frame connecting said cases and adapted to fold within the stationary case, travelers carried by the front-wall section, a folding headboard carried by the bed-frame for extension approximately parallel with the bed-frame to be traversed by said travelers, and locking devices for securing the headboard in its extended position, the same consisting of serrated shanks having laterally-extended arms to overlap the headboard, and sockets, to receive the shanks, provided with detents to engage the serrations of the shanks, substantially as specified.

16. In a folding bed, the combination of a stationary case having a front-wall section mounted for vertical and swinging movement, a movable case adjustable toward and from the stationary case, a bed-frame connecting said cases and adapted to fold within the stationary case, levers fulcrumed at intermediate points upon the stationary case, flexible connections between the front ends of said levers and the front-wall section, and other flexible connections between the rear ends of said levers and the head end of the bed-frame, substantially as specified.

17. In a folding bed, the combination of a stationary case having a front-wall section mounted for vertical and swinging movement, said section having a slide-stirrup, and the stationary case having a guide-rod engaging said stirrup, a movable case adjustable toward and from the stationary case, a bed-frame connecting said cases and adapted to fold within the stationary case, and a balanced lever mounted in the stationary case and having its arms connected respectively with the front-wall section and the head end of the bed-frame, substantially as specified.

18. In a folding bed, the combination of a stationary case, a movable case adjustable toward and from the stationary case, a bed-frame adapted to fold within the stationary case, connecting-links hingedly mounted at their extremities respectively upon the stationary case and the bed-frame at fixed points, and connections between the foot end of the bed-frame and said movable case, substantially as specified.

19. In a folding bed, the combination of a stationary case, a movable case adjustable toward and from the stationary case, a bed-

frame adapted to fold within the stationary case, counterbalancing devices connected with the head end of the bed-frame, connecting-links hingedly mounted at their extremities respectively upon the stationary case and the bed-frame at fixed points, and connections between the foot end of the bed-frame and said movable case, substantially as specified.

20. In a folding bed, the combination of a stationary case, a movable case adjustable toward and from the stationary case, a bed-frame adapted to fold within the stationary case, rear connecting-links hingedly mounted at their rear ends upon the stationary case and at their front ends upon the bed-frame at fixed points approximately at the center of the length thereof, and swinging connections between the foot end of the bed-frame and the movable case, substantially as specified.

21. In a folding bed, the combination of a stationary case, a movable case adjustable toward and from the stationary case, a bed-frame adapted to fold within the stationary case, rear connecting-links hingedly mounted at their rear ends upon the stationary case and at their front ends upon the bed-frame at fixed points approximately at the center of the length thereof, front connecting-links pivotally mounted at their rear ends upon the bed-frame at fixed intermediate points, and pivotally mounted at their front ends upon the movable case, and means for limiting the rearward-swinging movement of the upper ends of said front connecting-links, substantially as specified.

22. In a folding bed, the combination of a stationary case, a movable case adjustable toward and from the stationary case, a bed-frame adapted to fold within the stationary case, rear connecting-links hingedly mounted at their rear ends upon the stationary case and at their front ends upon the bed-frame at fixed points approximately at the center of the length thereof, front connecting-links pivotally connected at their lower extremities to the movable case and at their upper extremities to fixed intermediate points of the bed-frame in rear of the foot end thereof, and stops arranged in the path of the rearward-swinging movement of said front connecting-links, substantially as specified.

23. In a folding bed, the combination of a stationary case, a movable case adjustable toward and from the stationary case, a bed-frame adapted to fold within the stationary case, rear connecting-links hingedly mounted at their rear ends upon the stationary case and at their front ends upon the bed-frame at fixed points approximately at the center of the length thereof, front connecting-links connecting the bed-frame at fixed intermediate points with the movable case, stops arranged in the paths of the rearward-swinging movement of said front connecting-links, and guiding devices for the foot end of the bed-frame, substantially as specified.

24. In a folding bed, the combination of a stationary case, a movable case adjustable toward and from the stationary case, a bed-frame adapted to fold within the stationary case, rear connecting-links hingedly mounted at their rear ends upon the stationary case and at their front ends upon the bed-frame at fixed points approximately at the center of the length thereof, front connecting-links pivotally connected at their lower extremities to the movable case and at their upper extremities to fixed intermediate points of the bed-frame in rear of the foot end thereof, and guiding-links also connecting the bed-frame with the movable case, substantially as specified.

25. In a folding bed, the combination of a stationary case, a movable case adjustable toward and from the stationary case, a bed-frame adapted to fold within the stationary case, rear connecting-links hingedly mounted at their rear ends upon the stationary case and at their front ends upon the bed-frame at fixed points approximately at the center of the length thereof, front connecting-links pivotally connected at their lower extremities to the movable case and at their upper extremities to fixed intermediate points of the bed-frame in rear of the foot end thereof, and guiding-links pivotally connected at their front ends to the movable case and at their rear ends to the bed-frame in front of the pivotal points of the rear ends of said front connecting-links, substantially as specified.

26. In a folding bed, the combination of a stationary case, a movable case adjustable toward and from the stationary case, a bed-frame adapted to fold into the stationary case, rear connecting-links connecting the stationary case with fixed intermediate points of the bed-frame, and connections between the bed-frame and the movable case whereby the foot end of the bed-frame is depressible, and locking devices for the foot end of the bed, including a latch and an engaging button, for supporting the foot end of the bed in its elevated position, substantially as specified.

27. In a folding bed, the combination of a stationary case, a movable case adjustable toward and from the stationary case, a bed-frame adapted to fold within the stationary case, connections between the bed-frame and the movable case, the bed-frame being fulcrumed upon said connections for tilting movement to depress the foot end thereof, links connecting the stationary case with the bed-frame at points in rear of the said fulcrum-points of the bed-frame, and manually-operable means connected with the head end of the bed-frame for imparting an initial upward movement thereto, substantially as specified.

28. In a folding bed, the combination of a stationary case, a movable case adjustable toward and from the stationary case, a bed-frame, connections between the bed-frame and the movable case, said bed-frame being

fulcrumed upon said connections for tilting movement to depress its foot end, swinging connections between the stationary case and the bed-frame, and manually-operable means, connected with the head end of the bed-frame, for imparting an initial upward movement to said head end, to tilt the bed-frame upon its said fulcrum, substantially as specified.

29. In a folding bed, the combination of a stationary case, a movable case adjustable toward and from the stationary case, a bed-frame, connections between the bed-frame and the movable case, said bed-frame being fulcrumed upon said connections for tilting movement to depress its foot end, swinging connections between the stationary case and the bed-frame, and means for elevating the head end of the bed-frame, the same including levers connected with the head end of the bed-frame, and exposed means, connected with the levers, for imparting movement to the bed-frame to tilt it upon its said fulcrum, substantially as specified.

30. In a folding bed, the combination of a stationary case, a movable case adjustable toward and from the stationary case, a bed-frame, connections between the bed-frame and the movable case, said bed-frame being fulcrumed upon said connections for tilting movement to depress its foot end, swinging connections between the stationary case and the bed-frame, and means for elevating the head end of the bed-frame, the same including levers connected with the head end of the frame, and a swinging member connected with said levers, substantially as specified.

31. In a folding bed, the combination of a stationary case, a movable case adjustable toward and from the stationary case, a bed-frame, connections between the bed-frame and the movable case, said bed-frame being fulcrumed upon said connections for tilting movement to depress its foot end, swinging connections between the stationary case and the bed-frame, and means for elevating the head end of the bed-frame, the same including levers connected with the head end of the frame, and a swinging member connected with said levers, and having an operating-tape, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

GEORGE W. SANOR.

Witnesses:
WM. WOLF,
B. WOLF.