No. 817,371. PATENTED APR. 10, 1906.

W. C. JAMES.

FOLDING BED.

APPLICATION FILED SEPT. 29, 1904.

2 SHEETS—SHEET 1

Fig. 1

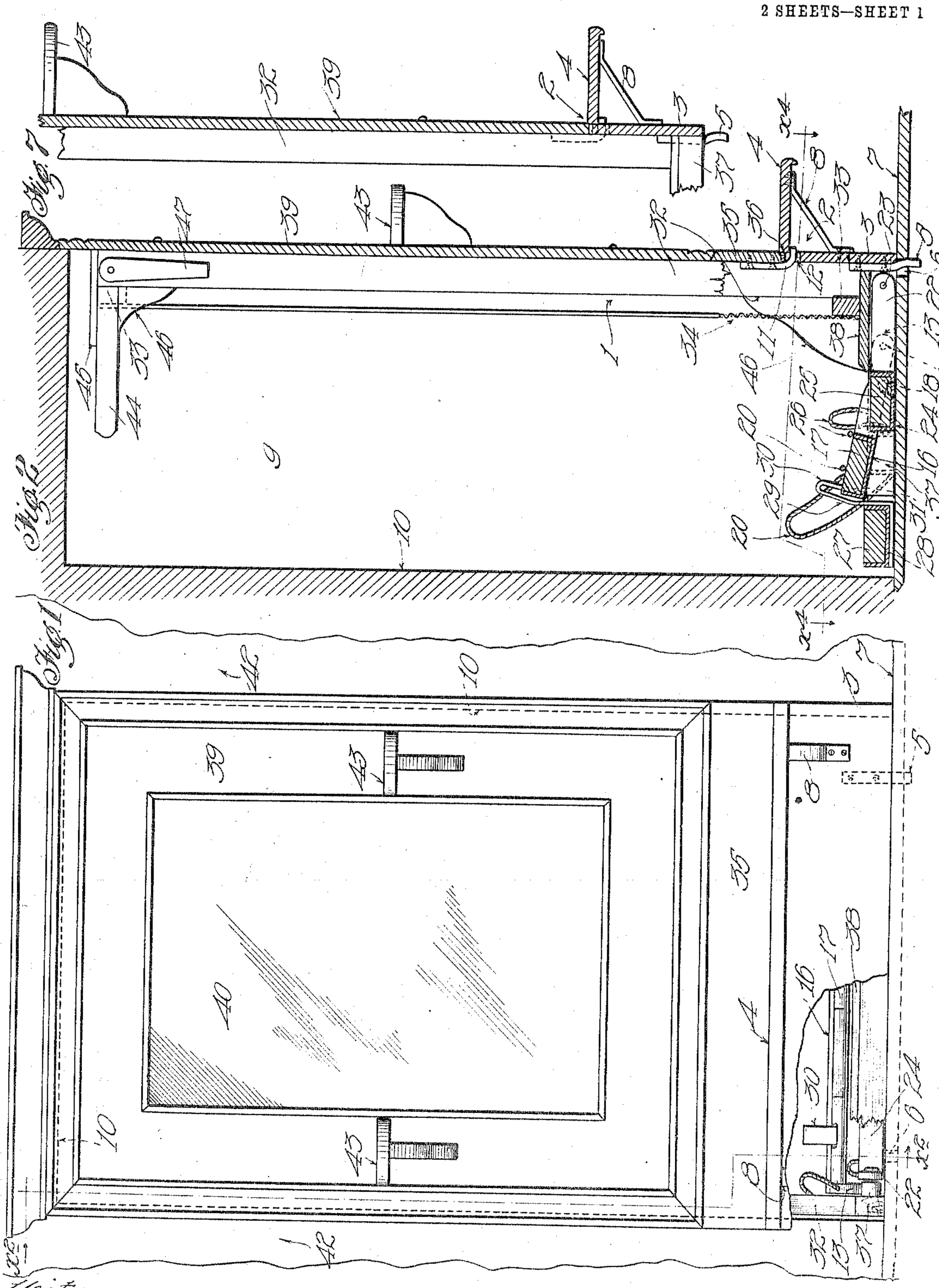

Fig. 2

Witnesses
Augustus Smith
A. P. Knight

Inventor
Willard C. James
by Townsend Bros
His Attys

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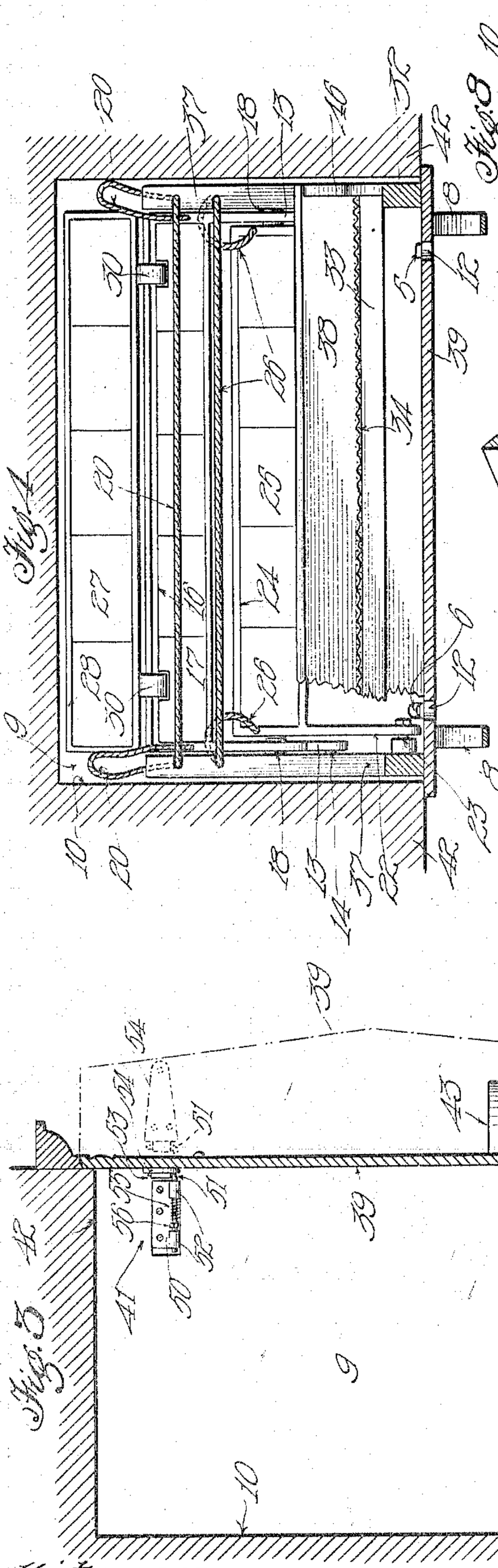

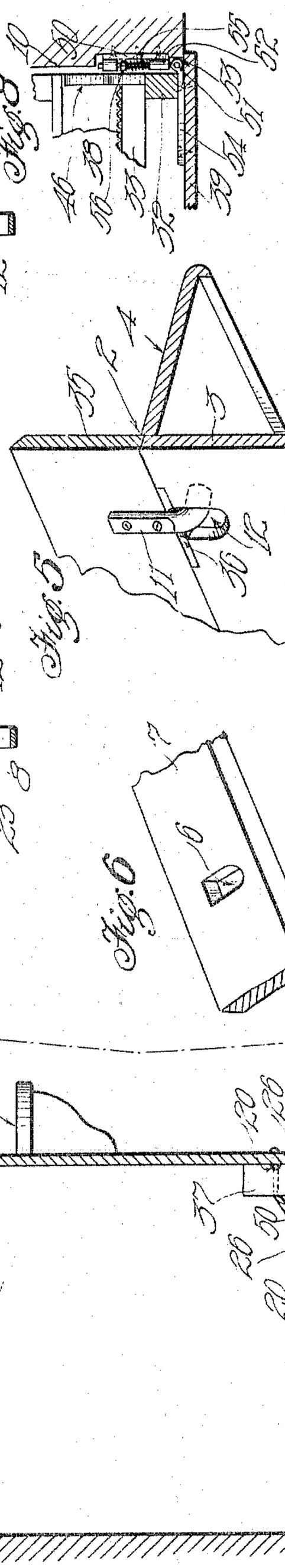

Witnesses
J. Swanfield
A. P. Knight

Inventor
Willard C. James
by Townsend Bros
His Attys

UNITED STATES PATENT OFFICE.

WILLARD C. JAMES, OF LOS ANGELES, CALIFORNIA.

FOLDING BED.

No. 817,371. Specification of Letters Patent. Patented April 10, 1906.

Application filed September 29, 1904. Serial No. 226,510.

To all whom it may concern:

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

The main object of this invention is to provide a folding bed which is simple in construction and easy to operate.

A further object of the invention is to reduce the amount of force required to pull the bed out from an upright position and to reduce the jar of the bed on reaching an upright position.

Another object of the invention is to provide a shelf means that will serve as a pivotal support on which the bed turns.

Another object of the invention is to make the bed free of permanent attachment to any fixed frame parts. The bed is particularly adapted for use as a part of a house construction, occupying a recess in a wall of an apartment, and its construction is such that it may be set in said recess or removed therefrom without any interference with other parts, and the only provision that has to be made for it is to make two holes or sockets in the floor of the recess to receive two claws or pins on the pivotal bed-support.

Another object of the invention is to provide a mirror-front for the folding bed that is so mounted as to be available for use as a mirror even when the bed is down.

Another object of the invention is to provide a folding-bed construction wherein exposed hinges are avoided, the pivotal connections being hidden, thereby giving a better appearance.

The accompanying drawings illustrate the invention.

Figure 1 is a partly-broken front elevation of the bed. Fig. 2 is a vertical section on line x^2 x^2 in Fig. 1. Fig. 3 is a vertical section on the plane of Fig. 2, but showing the bed in lowered position. Fig. 4 is a horizontal section on line x^4 x^4 in Fig. 2. Fig. 5 is a detail perspective of part of the pivotal support for the bed. Fig. 6 is a perspective showing one of the floor-sockets for engaging such pivotal support. Fig. 7 is a fragmentary vertical section showing a modified form of headboard. Fig. 8 is a fragmentary horizontal section with a hinge for a swinging closure for the bed-containing recess.

The bed comprises a frame 1, which is preferably of simple construction, consisting substantially of an ordinary "bed-spring" and a pivotal support 2, on which said frame rests and turns. Pivotal support 2 is desirably formed as an angle member or bracket, one leg 3 of which always rests on the floor and turns on its lower edge and the other leg 4 of which extends at right angles to leg 3 in a horizontal direction when the bed is upright and turns down to rest on the floor when the bed is lowered. Leg 3 of the pivotal support is desirably provided with means engaging or connecting with the floor to fix the position of the bed—for example, with claws, fingers, or pins 5, that extend into holes or sockets 6 in a base 7. The two parts 3 4 of angle member 2 may be connected by braces 8.

The bed is desirably arranged in a recess 9, formed in a wall 10, constituting part of an apartment construction. In this case the sockets or holes 6 are made in the floor of said recess to receive the pins 5.

The connection of bed-frame 1 to pivotal support 2 is such as to permit free pivotal movement of such parts, but prevent longitudinal movement, the bed-frame 1 in the lowering movement first moving bodily with member 2 and then turning on the angle or corner of member 2 as soon as the latter comes to rest with both legs standing on the floor. For this purpose bed-frame 1 may have lugs, hooks, or bent pins 11 engaging in holes or sockets 12 in the corner of angle member 2.

Counterweight means are connected to the bed in such manner as to facilitate the initial forward movement of the bed, but to resist the final downward movement. For this purpose arms or levers 13 are pivoted at 14 on the sides of the bed-frame 1 and are connected at their outer ends by a beam or bar 16, carrying counterweights 17. Bosses or abutments 18 are provided on floor or base 7, engaging levers 13 when the bed is raised so as to hold the weighted end of the lever in elevated position, said weighted end thereby acting through levers 13, fulcrumed on supports 18, to tip the bed-frame 1 forward. Levers or arms 13 are connected to the bed-frame 1 by cords or suitable flexible connections 20, which when the bed is raised are slack, but which when the bed reaches a certain angular position in its descent are tautened so as to pick up the weighted arms, and thereby resist the further downward move-

ment and compensate for the increase in downward tendency of the bed due to forward displacement of its center of gravity.

Further counterbalancing means are provided for the same purpose comprising arms 22, pivoted at 23 to the bed-frame 1 and carrying a cross-bar 24 with weights 25, said arms being connected to frame 1 by cords 26, which have less slack than the cords 20, so as to pick up arms 22 before arms 13. Another counterweight 27 may be provided to come into action after the main counterweight 17 to relieve or ease off the final descent of the bed-frame onto the floor, said counterweight 27 being carried by bar 28, having upwardly-extending arms 29, with hooks or guides 30 engaging over a bar 31 of the member 16, which bar slides in said guides until it reaches the upper end thereof, when it picks up the bar 28. Bars 16 24 28 may be formed as U-beams or channel-irons, the channels of which receive the respective counterweights, which may be ordinary bricks. This construction prevents the additional counterweight 27 from swinging toward the pivot 36 while said additional counterweight 27 is being lifted, but holds it farther from said pivot than the main counterweight.

The bed-frame 1 is preferably constructed of an ordinary bed-spring, consisting of stringers 32 and cross-bars 33, between which is stretched the spring 34, a cross-piece or board 35 being secured across the bottom of the bed and carrying the hooks or pins 11 to engage the sockets 12 in the pivotal support 2. Plates 36 are provided on the corner of said support to engage the hooks as the latter turns over thereon, as shown in Fig. 3. By reference to said figure it will be seen that this engagement of the hooks 11 with the sockets 12 forms a detachable connection between the bed-frame and the support 2. Posts 37 are secured at the corners at the head end of the spring-frame, the pivots of arms 13 22 and the cords 20 26 being all attached to said posts, and a board 38 is secured across the head of the bed between said posts to form the lower part of the headboard. Cords 20 26 are desirably extended through holes in posts 37 and across between said posts, so as to serve as guards to prevent the pillows from falling backward into the recess as the bed is being turned up.

The upper part 39 of the headboard preferably is formed with a mirror 40 on its front and is hinged at 41 on one side independent of the mounting of the bed to the casing 42 of recess 9, so as to allow it to be turned to one side, as indicated in dotted lines in Fig. 3, to allow the bed to be lowered. After the bed is lowered the mirror may be retained in that position for use or may be swung back to complete the headboard. Shelves 43 may be provided on the front of the headboard member 39. The parts are so constructed that when the bed is in upright position (see Fig. 2) the upright leg of pivotal support 2 and the cross-board 35 resting thereon will just reach to the bottom of the mirror-frame or headboard member 39, and when the bed is down the lower headboard member 38 will reach to the same height, so that in either case there will be a close fit and no apparent joint, this effect being aided by beveling the bottom of member 39 and the top of members 35 38.

At the foot of the spring bed-frame are secured posts 44 and cross-board 45 to complete the foot end of the bed, angle-pieces 46 being, if desired, secured between the posts 37 44 and the stringers 32 of the spring bed-frame. Legs 47 are pivoted at the outer ends of stringers 32 to support the outer end of the bed in lowered position.

In normal raised or upright position (shown in Fig. 2) the bed-frame is supported in vertical position by the bottom of the cross-piece 38 resting on the top of the vertical leg 3 of the angle member or support 2 and the posts 37 extending along and resting upon the floor or base 7. Moreover, the several members 3, 35, and 39 are under these conditions all arranged in one plane to form a complete closure for the recess, and the weight of all the said members will rest on the floor at the bottom of the lowermost member 3.

The hinged mirror-carrier 39 is closed, so that its bottom will come against the top of the cross-piece 38, forming a complete closure for the bed-containing recess. Weighted bars 24 and 28 will rest on the floor with their attached cords slack, and weighted bar 16 will be held up from the floor by engagement of the supporting-arms 13 with the fulcrums 18, the inner ends of said arms acting in the manner of a lever of the first order to pry up or lift the part of the bed-frame to which they are connected, so as to tend to throw the bed-frame forward.

When the bed is to be lowered, the swinging mirror-carrier 39 is first swung to one side, as indicated in dotted lines in Fig. 3. The bed is then grasped, for example, by taking hold of one of the stringers and drawn forward, the bed-frame 1 turning, together with the pivotal support member 2, the whole structure rocking forward on the lower end of the leg 3 of the supporting member until the other leg of said member strikes the floor, thereby arresting the pivotal movement thereof, the further descent of the bed being effected by turning on the angle or corner of the angle member or pivotal support.

In the initial movement counterweight 16 17 acts as above described to help the forward movement of the bed and render it easier for the bed to be drawn into a position in which its own weight will continue the forward movement. When this position is reached, the posts 37 have risen sufficiently

to allow the counterweight device 16 to touch the floor or base 7 and to move free of the fulcrum 18. At that moment, or shortly thereafter, the suspending-cord 20 will be stretched tight, so that said counterweight instead of acting to tilt the bed forward will then act to resist the further tilting movement. As the bed-frame continues to descend the effect of gravity thereon will increase, but is compensated for by the counterweight devices 24 25, the suspending-cord 26 being tightened and serving to pick up the said counterweight devices to increase the counterbalancing effect. Similarly, in the final downward movement the counterweight devices 27 28 are taken up, as above described, to enable the bed to come easily and smoothly to rest on the floor and prevent any jarring or violent descent. The mirror may now be left in open position for use or may be swung closed, as shown in Fig. 3 in full lines.

When the bed is to be raised, the mirror-carrier and headboard member 39 is swung open if not already in that position and the bed is lifted, the bed-frame turning on the support member 4, which remains stationary until the cross-piece 38 on the bottom of the bed comes in line with the leg 3 of said member and the stringers 32 of the bed come against the side of said leg 3, as indicated by broken lines in Fig. 3.

The further upward movement of the bed-frame will carry the member 4 along with the bed-frame, the whole structure turning on the bottom of the leg 3 of said member until the parts resume the upright position. (Shown in Fig. 2.) In this movement the counterweight device 27 28 is first deposited on the floor, thereby relieving the bed of a certain amount of counterbalance. Counterbalance 24 25 is next deposited and then counterbalance 16 17 strikes the floor, thereby relieving the bed of any counterbalancing effect.

Further movement of the bed to a vertical position would if not resisted take place with such violence as to cause considerable jar and noise; but this is prevented by the carrier-arms 13 of the counterbalance device 16 17 striking the projections 18 on the floor of base, so that the final downward movement of posts 37 will raise the counterbalancing device and cause it to exert a forward tilting action on the bed, as above explained.

The supporting-levers 13 and 22 and the respective counterbalancing devices carried thereby are arranged one within the other or nested, as shown.

In case the separate mirror is not desired the headboard member 39 may be secured on the bottom of the bed, so as to move therewith, as shown in Fig. 7, the shelves 43 being in that case extended sufficiently to act as feet or legs for the bed when lowered.

The hinges 41 are desirably of the construction shown in Figs. 3 and 8, comprising a bracket or hinge member 50, secured to the side of the casing 42 or recess 9, an L-shaped pin 51, one of whose arms is horizontal and slides in eyes 52 of said member 51, the other arm of said bent pin extending vertically upward to engage in the eye 53 of the other hinge member 54, which is attached to the inside of the swinging closure member 39. A spring 55, surrounding the horizontal arm of hinge-pin 51, engages between one of the eyes 52 and a nut 56, screwing on said horizontal arm of the hinge-pin, to adjust the tension of the pin. The adjacent edge of the swinging closure 39 extends somewhat beyond the edge of the casing 32, as shown in Fig. 8, so that when the closure is swung outwardly this projecting portion will engage with the front of the casing to pull the hinge-pin 51 outwardly and with the result that the spring-hinge described will act to resist the outward movement and to pull the swinging closure into a closed position.

What I claim is—

1. A folding bed comprising a pivotal support mounted to turn on its lower end and provided with means to arrest its pivotal movement and a bed-frame pivotally mounted on said pivotal support the bed-frame resting on the said support, and the latter resting on its pivotal mounting, when the bed is in raised position.

2. A folding bed comprising a rigid angle member mounted to turn on the lower end of one leg of the angle and to be arrested by the other leg of said angle and a bed-frame pivotally mounted on said angle member at the angle thereof.

3. A folding bed comprising a base having sockets, an angle member having sockets at its angle and provided with projections on the lower end of one leg engaging the sockets in the base, the angle member turning on said end and the other leg of the angle member serving to arrest the turning movement of the member and a bed-frame having projections engaging in the sockets in the angle member.

4. A folding bed comprising an angle member, one leg of which extends normally in a vertical position to serve as a support and the other leg extends normally in a horizontal position to serve as a shelf, means for pivotally supporting the lower end of the vertical leg and a bed-frame vertically connected at the angle of the angle member and having a part normally resting directly on said angle member independent of the pivotal connection.

5. A folding bed comprising a pivotal support mounted to turn on its lower end and resting on its pivotal mounting when the bed is raised and having means to arrest its pivotal movement and a bed-frame resting, when in raised position on said pivotal support and

movable to turn therewith in the initial movement of said pivotal support, said bed-frame engaging with the pivotal support by a connection allowing the bed-frame to turn on the pivotal support after the movement of the latter has been arrested.

6. In a folding bed the combination with a pivotally-supported bed-frame, of a counterweight-lever operatively connected to the bed-frame to tend to tip the same forward when in raised position.

7. In a folding bed the combination with a pivotally-mounted bed-frame, of a counterweight means connected to the bed-frame to oppose the descent thereof and means engaging said counterweight means to reverse the action thereof when the bed is raised to cause forward pressure on the bed-frame.

8. In a folding bed, the combination with a pivotally-mounted bed-frame of a counterweight-lever pivotally connected thereto and a flexible connection between said counterweight-lever and the bed-frame to cause the bed-frame to pick up the counterweight-lever in its pivotal movement.

9. In a folding bed the combination with a pivotally-mounted bed-frame of a counterweight device pivotally connected thereto, a flexible connection between said counterweight device and the bed-frame to cause the bed-frame to pick up the counterweight device in its pivotal movement, and means engaging said counterweight device between the weighted portion thereof and a pivotal connection with the bed-frame to reverse the action of the counterweight device when the bed is raised.

10. In a folding bed, the combination with a pivotally-mounted bed-frame, of a plurality of counterweight-levers pivotally connected thereto and flexible connections between said counterweight-levers and the bed-frame having different amounts of slack so that the bed-frame will pick up the counterweight-levers successively in its downward movement.

11. In a folding bed a combination with a pivotally-mounted bed-frame of a counterweight device connected thereto, and an additional counterweight device having arms normally free of engagement with the aforesaid counterweight device but engaging therewith after a definite amount of pivotal movement thereof, to cause the counterweight devices to be brought into action accumulatively.

12. In a folding bed, the combination, with a bed-frame mounted on a pivot, of a main counterweight device and an additional counterweight having means engaging with the main counterweight device to hold additional counterweight in a position farther from said pivot than the main counterweight device, said means adapted to pick up said additional counterweight after a definite movement of the main counterweight device.

13. A wall-casing having a recess, a base-piece extending across the front of the recess and provided with means for removably holding the same in position and a folding bed pivotally mounted on said base-piece to fold into the recess.

14. A wall-casing having a recess, a base-piece extending across the front of the recess and provided with means for removably holding the same in position and a folding bed detachably mounted on said base-piece to fold into the recess.

15. A casing, and a folding bed adapted to fold into said casing, said bed provided with a pivotal support formed with two members, one of which always rests on the floor of the casing, and the other of which is movable toward and from said floor.

16. A casing, and a folding bed adapted to fold into said casing, said bed provided with a pivotal support having two legs, one of which is pivotally mounted on the floor of the casing, and the other of which is movable toward and from said floor.

17. A casing provided with a floor having a socket therein, and a folding bed adapted to fold into said casing, said bed provided with a pivotal support having two legs, one of which is provided with means engaging said socket, the other leg being movable toward and from said floor.

18. A casing provided with a floor having a socket therein, and a folding bed adapted to fold into said casing, said bed provided with a pivotal support having two legs, one of which is provided with a claw engaging said socket, the other leg being movable toward and from said floor.

19. A combination of a pivotal support, mounted to turn on its lower end and provided with means for arresting its pivotal movement, a bed-frame provided with a cross-piece extending across the bottom thereof, and normally resting on said pivotal support, and provided with means engaging with the pivotal support whereby the bed-frame will turn with the pivotal support until the pivotal movement of the latter is arrested, and will then continue to turn on the pivotal support and said bed-frame being provided with a cross-piece forming a part of the headboard, said cross-piece when the bed is lowered extending to the same height as the aforementioned cross-piece when the bed is raised, and a headboard member pivotally mounted at one side of the bed-frame independent of the mounting of the bed-frame, with its lower edge coming in a closed position to adjoin the tops of the cross-pieces aforesaid when the bed is in open or closed position.

20. The combination with a pivotally-mounted folding bed having head corner-posts and a headboard-base extending between the lower part of said posts, cords extending between the upper part of said posts,

and a movable headboard member pivotally mounted independent of the bed to swing above the headboard-base.

21. A casing and a folding bed therein comprising a member having a leg member pivotally resting on the floor of the casing, a bed-frame pivotally supported on said leg member and having a member extending across its bottom and resting on the aforesaid leg and a closure member hinged at one side of said casing and adapted to rest on said cross member when the bed is closed, the three said members being all in one plane when in closed position.

22. A casing forming a recess and a folding bed in said casing provided with closure members for the lower part of said recess and a closure member for the upper part of the recess connected to the casing by spring-hinges tending to close said closure member.

23. A casing forming a recess and a folding bed in said casing provided with closure members for the lower part of said recess and a closure member for the upper part of the recess connected to the casing by spring-hinges tending to close said closure member, said spring-hinges each comprising a horizontal pin slidably supported on the casing and having a vertically upwardly extending portion, a hinge portion on the closure member having an eye engaging said upwardly-extending portion of the pin and spring means on the horizontal portion of the pin and means for adjusting the pressure of said spring.

In testimony whereof I have hereunto set my hand, at Los Angeles, California, this 23d day of September, 1904.

WILLARD C. JAMES.

In presence of—
A. P. KNIGHT,
JULIA TOWNSEND.