No. 837,145. PATENTED NOV. 27, 1906.

J. L. TANDY.

FOLDING BED.

APPLICATION FILED OCT. 21, 1905.

2 SHEETS—SHEET 1.

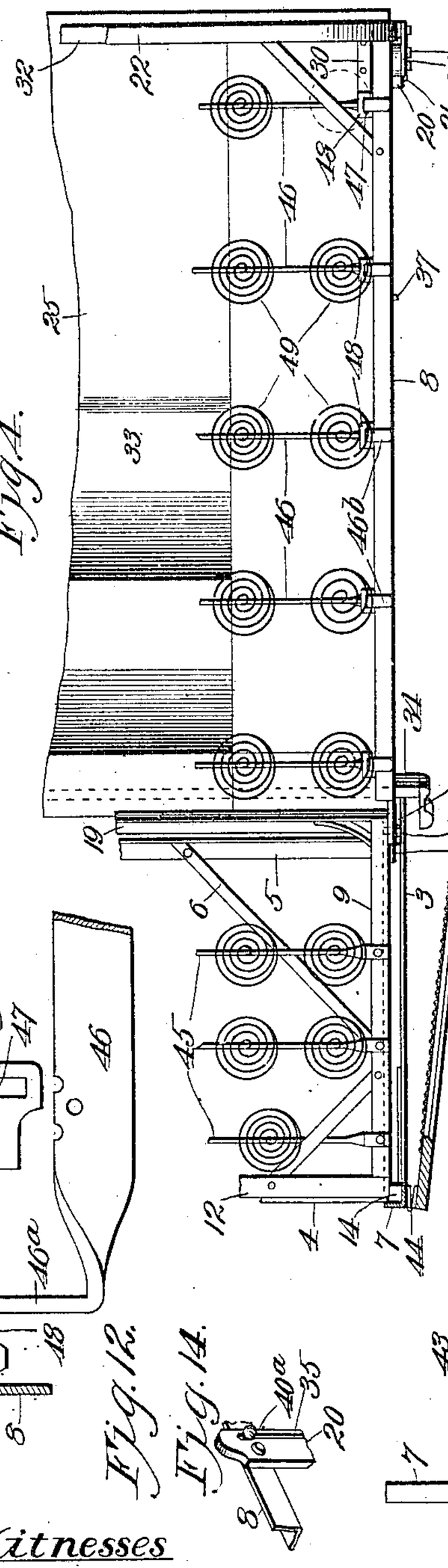

Fig. 4.

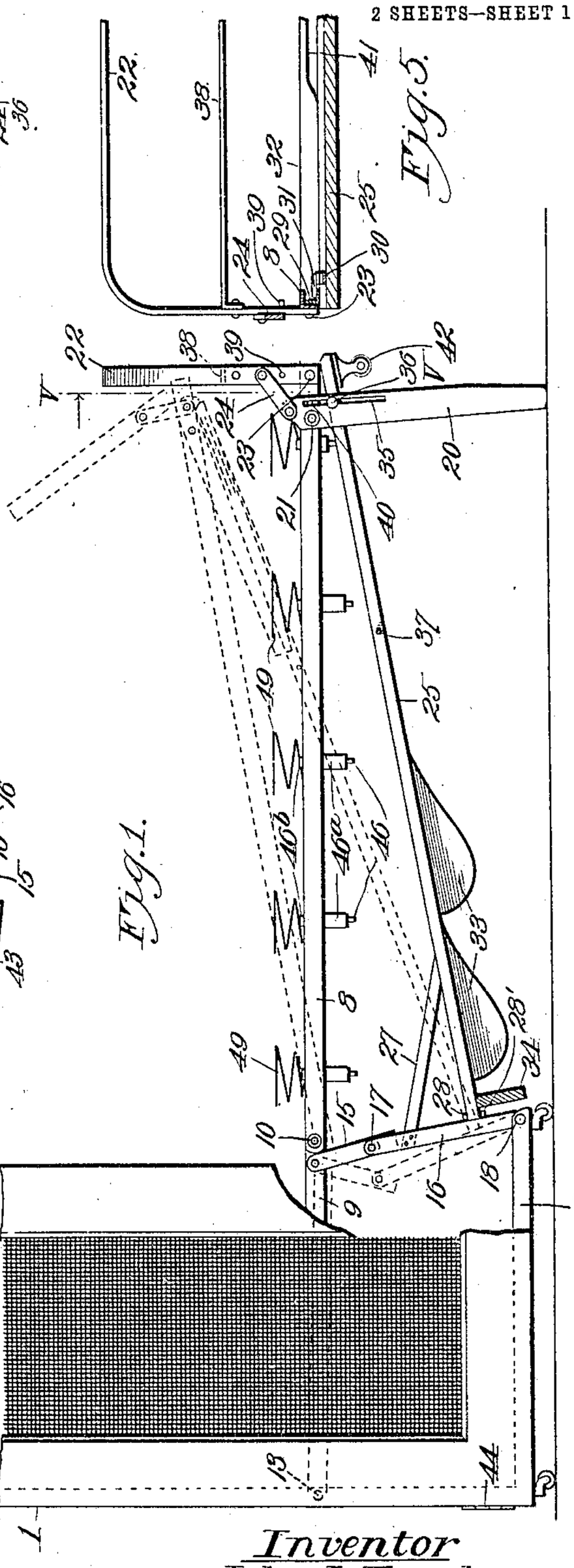

Fig. 5.

Fig. 13.

Fig. 12.

Fig. 14.

Fig. 1.

Witnesses

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2 SHEETS—SHEET 2.

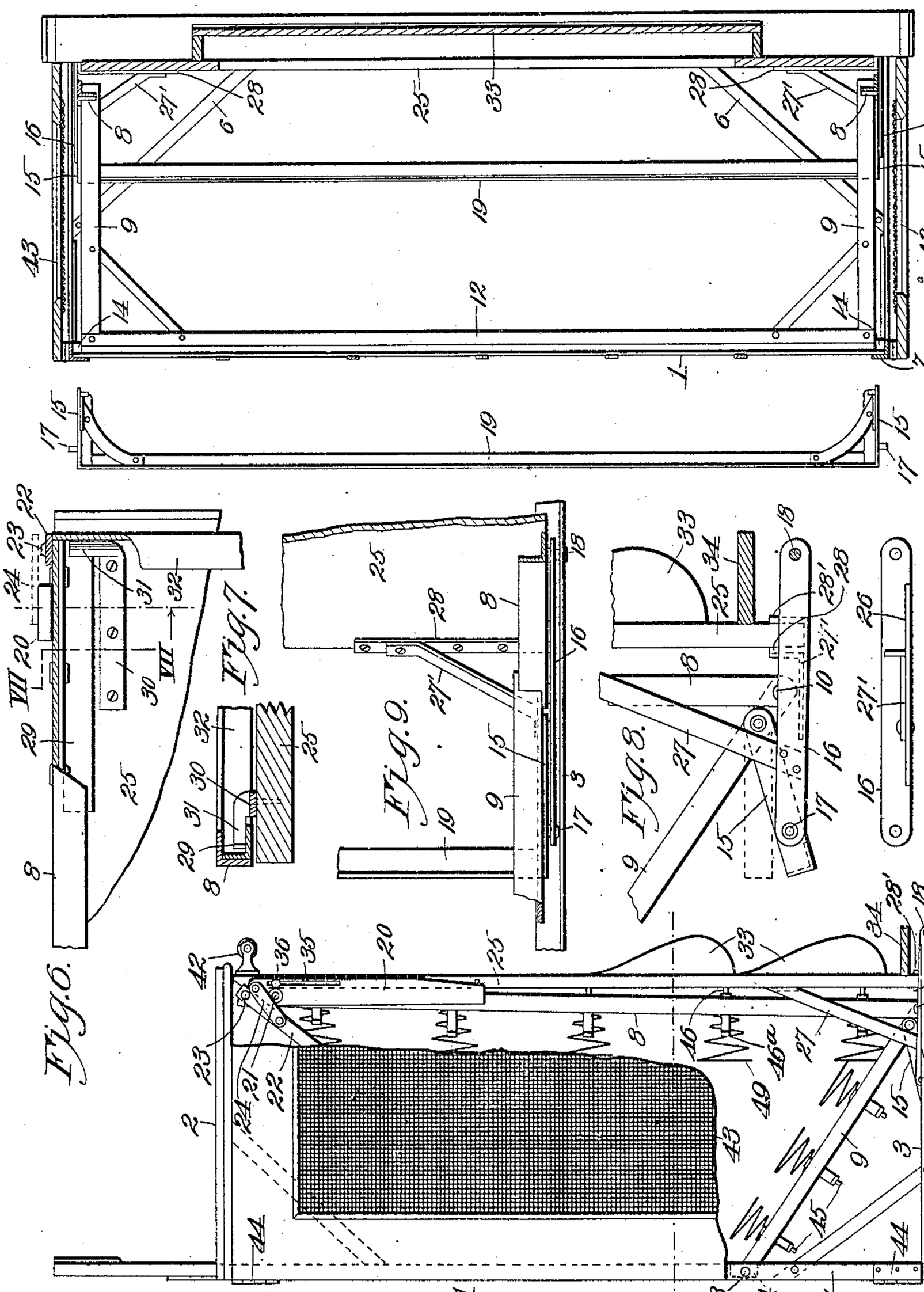

Fig. 3.

Fig. 11.

Fig. 7.

Fig. 9.

Fig. 8.

Fig. 10.

Fig. 6.

Fig. 2.

Witnesses

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UNITED STATES PATENT OFFICE.

JOHN L. TANDY, OF KANSAS CITY, MISSOURI.

FOLDING BED.

No. 837,145. Specification of Letters Patent. Patented Nov. 27, 1906.

Application filed October 21, 1905. Serial No. 283,836.

To all whom it may concern:

Be it known that I, JOHN L. TANDY, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Folding Beds, of which the following is a specification.

My invention relates to folding beds of that character comprising a head and a foot portion hinged together so that when folded the height of the bed shall be substantially equal to the length of the foot portion.

The general object of the invention is to produce a bed of this character which cannot be folded up when locked by weight imposed at any point thereon.

A more specific object is to provide means for automatically gripping the mattress or other bedding at the foot thereof while the bed is being lowered or folded up, thereby preventing the bedding from creeping away from the foot of the bed.

With these and other objects in view, as hereinafter appear, the invention consists in certain novel and peculiar features of construction and organization, as hereinafter described and claimed, and in order that it may be fully understood reference is to be had to the accompanying drawings, in which—

Figure 1 is a side elevation, partly broken away, of a bed constructed in accordance with my invention, said figure also showing in dotted lines the positions assumed by the parts at a certain point of the folding or unfolding movement. Fig. 2 is a side elevation of the bed in folded position, a portion of the screens being broken away to disclose the interior. Fig. 3 is a sectional plan view, on the line III III of Fig. 2, omitting the bed-springs and their supporting-bars. Fig. 4 is a sectional plan view of one side of the bed when opened. Fig. 5 is a sectional view, partly broken away, taken on the line V V of Fig. 1. Fig. 6 is an enlarged detail view of one of the end supports for the front of the bed in the position they assume when the bed is fully open. Fig. 7 is a sectional view taken on the line VII VII of Fig. 6. Fig. 8 is an enlarged view, in side elevation, of the break-joint between the side rails of the bed and certain connected parts. Fig. 9 is a sectional plan view of the same parts in a different position—namely, after the bed has been partly lowered and with some of the parts omitted. Fig. 10 is an inside view of a rocker-arm forming part of the bed. Fig. 11 is a detached plan view of parts forming part of the invention. Fig. 12 is an enlarged detail view of the means for mounting the metal slats upon the bed where spiral springs are employed. Fig. 13 is a plan view of one of the slotted guides shown in Figs. 4 and 12, and Fig. 14 is a view showing one of the leg-locking pins in operative position.

The stationary or head portion of the bed comprises, essentially, an upright head-frame 1 of any suitable construction, and a horizontal shelf 2, which forms a convenient receptacle for ornaments and prevents dust from settling from the air into the bedding. The bottom of the head-frame is connected to a base-frame constructed of lateral bars 3 and cross-bars 4 and 5. (Seen, respectively, in Figs. 3 and 4.) The braces 6 (shown in Fig. 3) are a part of this base-frame. The corner-uprights 7 of the head-frame 1 are secured in any suitable manner to the base-bars 3. The various bars just mentioned are by preference constructed of angle-iron, as combining lightness with strength and being otherwise well adapted for their construction.

The side rails of the bed are each composed of two sections, a longer section 8 and a shorter section 9, hinged together at a point 10, which divides the rail in about the proportion of two to one. The upper ends of the shorter rail-sections are connected by a head-rail 12, Fig. 3, and are pivotally connected at points 13 to the corner-posts 7. The pivot-pins pass through the blocks 14, interposed between said posts 7 and the ends of said rail-sections 9, whereby the latter are spaced inwardly from the aforesaid base-frame. Said connections of the rail-sections 9 permit them to swing down to the position shown in Fig. 2 when the bed is fully closed.

The side rails adjacent the points 10 are supported by upper links 15 and lower links 16, which stand in the position shown in Fig. 1. The upper links are pivotally connected to the rail members 9 just above the points 10 and are pivotally connected to the lower links, as at 17. The lower ends of the lower links are pivotally connected, as at 18, to the lateral base-bars 3. The lower ends of the upper links 15 at the two sides of the bed are rigidly connected together by a transverse bar 19. (Shown in Figs. 3 and 11 and in part in Figs. 4 and 9.) This bar not only acts as a brace to said links 15 and 16, but when

drawn up by the opening of the bed it impinges upon the lower sides of the upper side rail-sections 9 and lifts the same for a certain distance, as hereinafter described. The lower ends of the longer rail-sections 8 are supported when open by two metal legs 20, which are pivotally connected to the rails at 21, so that the legs may turn through an arc of about ninety degrees, or from the position shown in full lines, Fig. 1, to the position shown in dotted lines.

22 indicates an arched foot-bar, the ends of which are pivotally connected at 23 to the ends of the side rails 8. This foot-bar is capable of turning from the full-line position shown in Fig. 1 to the full-line position shown in Fig. 2. The sides of the foot-bar are connected to the upper ends of the legs 20 by pivoted braces or links 24, which transmit motion from the legs to the foot-bar when the bed is folded or lowered.

25 indicates a preferably wooden plate, which forms when the bed is closed an ornamental front and when the bed is open assumes the position shown in full lines, Fig. 1. Its lower end is supported by the longer links 16 and its opposite end is slidingly secured to the side rails 8, as hereinafter explained. The details of the connection are as follows: Extending from the sides of the plate 25 to the link 16 is a brace 27. Each link 16 is provided on its inner face with a flange 26, Fig. 10, and to this flange is riveted a brace 27′, which may be secured directly to the plate 25, but, as shown in Fig. 9, is secured to a strip of metal 28, which is secured to the transverse edge of the plate 25. This strip 28 and a similar strip 28′ act to reinforce the plate to guard against its splitting. The opposite end of the plate 25 at the sides thereof is slidingly connected to the side rails 8 as follows: To the inner face of each rail 8 is riveted a short angle-bar 29, the flange of which projects inwardly and flush with the bottom of the rail, said flange, in conjunction with the flanges of the rail, forming a groove or guideway receiving an arm 31 of a bar 30, secured to the inner face of the plate. When the bed is lowered or in open position, the weight of plate 25 will cause the arms 31 to bear against the flanges 29. When folding the bed to inoperative position, the lifting force is first applied to the foot-rail 32, rigidly connecting the ends of side rails 8, the plate 25 being raised through the medium of said flanges 29 and arms 31. Therefore when the foot-rail is being raised the movement of plate 25 will swing the links 16 forwardly, as indicated by the dotted lines in Fig. 1. During this movement the arms 31 have slid forward upon the flanges 29, owing to the distance between the pivotal points 18 and 10, about which the plate 25 and the rail-sections, respectively, have their motion. By reference to Fig. 6, in which the bed is supposed to be in open position, it will be seen that the arm 31 is in contact with the inner face of the foot-rail 32. By the contact of the two arms at the bed sides with said rail the entire folding portion of the bed is rendered stiff and rigid when open, so that the bed may be moved upon the floor in any direction without causing any relative movement between the plate 25 and the bed-frame. As the operator continues to push or lift up the foot-rail 32, the short lines 15, and hence the shorter rail-sections 9, will be swung rearwardly by the action of the longer links 16 thereupon. When the bed is fully folded, the parts assume the positions shown in Fig. 2, the longer links being nearly horizontal just inside the base-frame bars 3 3 and the joints 10 of the side rails being about as low as the upper edges of said frame.

The plate 25 is shown as provided with swells 33 for ornamental effect. In this case the lower edge of said plate is attached to the links a few inches distant from the pivots 18, and a molding 34 is secured to the plate below the lower swell in order to conceal the metal base of the bed when folded; but in case a plain flat front is employed without swells the pivots 18 might be moved inwardly to points in alinement with the plate 25, thereby permitting a shortening of the links 16 and the requisite lengthening of the links 15 connected thereto, whereby the height of the break-joints 10 would remain unchanged, it being understood the particular length of each link is unimportant, provided that their joint lengths is such that the head and foot sections are horizontal when the bed is open.

The movements of the parts shown in Fig. 8 when the bed is lowered from closed position are briefly as follows: The outward movement of the plate 25 swings up the lower links 16, which swing up the shorter links 15. The cross-bar 19, carried by links 15, in ascending strikes the lower edges of the rail-sections 9 and continuing upward raises said rail-sections a certain distance. From this point on the longer links 16, forming with links 15 a pair of toggle-joints, lift the rail-sections 9, which in turn draw up the folding rail-sections 8 until the two form a straight line just as the legs 20 strike the floor.

In order that the foot-arch 22 and the legs 20 shall assume the folded positions shown in Fig. 2, it is necessary to provide pin-and-slot or equivalent connections between the legs and the plate 25. A slot 35 is formed longitudinally in each leg, and a headed pin 36, driven or otherwise secured in the plate 25, projects through said slot. Starting with the bed open, it is clear that when the folding movement is commenced the aforesaid relative movement of the plate 25 will draw the legs up into parallelism therewith by the ac-

tion of the pins 36 upon them. The further lifting of the bed beyond the dotted-line position will start a reverse movement of the plate 25—that is, said plate will begin to slide toward the operator. A pin 37 is driven into each side or edge of the plate 25 in such position that said reverse movement of the plate will cause these pins to pass beneath the legs a short distance, as shown in Fig. 2. During this movement the headed pins 36 slide toward the upper ends of the slots 35, and at the same time the legs are swung inwardly. When they engage or are engaged by the projecting pins 37, such engagement prevents any reverse or unfolding movement of the legs during the folding of the bed and during the initial unfolding movement of the bed. Said pins likewise prevent the unfolding of the legs until they have become disengaged therefrom by sliding forwardly beyond them. During the folding movement of the bed the combined action of the parts upon the foot-arch 22 is first to rapidly turn it upon its pivot away from the operator.

The foot-arch is provided with suitable means for gripping the foot of the mattress when this tilting of the arch occurs, said gripping means consisting, preferably, of a bar 38, extending transversely from side to side of the foot-arch at a suitable distance from the foot-rail 32, and this bar 38 when the bed has passed the dotted-line position in Fig. 1 descends forcibly upon the foot of the mattress or other bedding, and thereby prevents the bedding from sliding downwardly or toward the head when the bed is being or has been completely folded. By the aforesaid action of the pins 37 upon the legs 20 the mattress-bar 38 is prevented from loosening the hold upon the bedding until the bed has been sufficiently opened to render its action unnecessary.

In the case of a new or stripped bed the absence of a mattress removes the resistance to the mattress-bar 38, and means for preventing the foot-arch from falling back (to the right in Fig. 2) is desirable. The effect is produced by an inwardly-projecting pin 39, carried by each side of the foot-arch, said pins being so positioned that when the bed in being folded has reached a certain position the weight of the foot-arch will drop these pins upon the side rails 8, thereby preventing any further movement of the arch in that direction. In order that this bed shall be absolutely safe—that is, so that it cannot under any circumstances fold up accidentally when in use—means are provided for locking the movable parts, if so desired, when the bed has been opened. A simple and effective device for this purpose consists in drilling a swell hole 40 through one or each of the side rails 8 in register with the upper end of the slot or slots 35 of the legs. By inserting a suitable key-plug 40[a] (see Fig. 14) into one of said holes it will be readily understood that the turning of the legs will thereby be prevented, and consequently the side rails, the links 24, the plate 25, and the legs form a rigid substantially triangular figure which is rigidly secured at two different points to the head portion of the bed. In starting to fold the bed the foot-rail 32 should be grasped, as aforesaid. As this rail is in contact with the plate 25 in this position of the bed, it is desirable to form a suitable recess 41, Fig. 5, in the lower side of said rail, which recess is large enough to permit the fingers of the operator to grasp the reduced portion of the rail from underneath. When the bed is closed, the outer edge of the plate 25 fits loosely against the lower surface of the shelf 2. When starting to lower the bed, the pull should be applied to the plate 25, and to this end said plate is provided with a handle 42. The head portion of the bed is completed by two side panels or screens 43, which extend from the shelf 2 to the base-frame and are of sufficient breadth to conceal all the metal portions of the bed when folded. By preference these panels or screens are attached to the corner-posts 7 by means of hinges 44, so that they may be swung open when the bed is to be occupied. The screen form is preferred to a solid panel for several reasons, among which are that the sheets are of foraminous material, and thus permit a circulation of air through the closed bed, while screening the interior of the bed from sight, and the weight of the screens is materially less than that of solid panels. The screen portions may be made of woven cane or brass-wire cloth, either of which presents a pleasing appearance.

As a matter of course any preferred style of springs or spring-mattress may be attached to the bed-rails. Persons who desire a comfortable bed that is not liable to sag in the middle generally prefer spiral springs under a regulation mattress. In the drawings the bed is shown as equipped with spiral springs. These are supported by metal cross-bars 45 and 46, the former supporting the springs nearest the head of the bed and the latter the springs in the folding portion.

In order to permit the use of springs of proper depth and which do not project too far above the rails, it is necessary to drop the supporting-bars 45 and 46 below the rails, as shown. The ends of bars 45 at the head of the bed may be rigidly secured to the rail-sections 9, as indicated in Fig. 4. With regard to the other spring-bars 46 the case is different, as will be seen by comparing Fig. 1 with Fig. 2—that is to say, when the bed is open the bars 46 rest in their normal positions, but when the bed is folded the plate 25 stands closer to the bed-rails than when open. Hence the spring-bars 46 must be so

constructed as to yield to the pressure of the plate 25. A preferred means for permitting such motion is to pass the upturned end of bars 46 through slots 47 in lugs 48, which are riveted or otherwise secured to the under face, preferably, of the rails, as shown in Fig. 12. The portion 46^a of the bar fits the slot loosely, and the end portion 46^b is bent outwardly and normally rests upon the rail. As the bed is folded up the plate 25 impinges upon the bars 46 and forces them inwardly. The bar 46 nearest the foot of the bed cannot hang so low as the others, because of the close proximity of the plate 25 to the rails 8 at this point when the bed is open.

It will be evident from a comparison of Figs. 2 and 4 that if the springs are arranged in straight rows lengthwise of the bed, the springs of the head portion being in alinement with those of the folding portion, as shown, the two transverse rows of springs at opposite sides of the break-joint must be sufficiently spaced apart not to unduly interfere with each other when the bed is closed. A closer spacing of said two rows of springs may be obtained by setting the springs in one row opposite the spaces between the springs of the other row.

Having thus described the invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A folding bed, comprising an upright portion having a base, a head-rail section pivoted to the upright portion, a foot-rail section pivoted to the head-rail section, a break-joint brace between the base and the pivoted head-rail and foot-rail sections, legs pivoted to the foot-rail section, and means connected to the brace and legs and slidable longitudinally upon the latter.

2. A folding bed, comprising an upright portion having a base, a head-rail section pivoted to the upright portion, a foot-rail section pivoted to the head-rail section, a break-joint brace between the base and the pivoted head-rail and foot-rail sections, legs pivoted to the foot-rail section, and means connected to the brace and having a pin-and-slot connection with the legs.

3. A folding bed, comprising an upright portion having a base, a head-rail section pivoted to the upright portion, a foot-rail section pivoted to the head-rail section, a break-joint brace between the base and the pivoted head-rail and foot-rail sections, legs pivoted to the foot-rail section, means connected to the brace and having a slidable connection with the legs, a foot-rail pivoted to the foot-rail section, and means whereby pivotal movement of the foot-rail shall impart pivotal movement to the legs.

4. A folding bed, comprising an upright portion having a base, a head-rail section pivoted to the upright portion, a foot-rail section pivoted to the head-rail section, a break-joint brace between the base and the pivoted head-rail and foot-rail sections, legs pivoted to the foot-rail section, means connected to the brace and having a slidable connection with the legs, a foot-rail pivoted to the foot-rail section, and means whereby pivotal movement of the foot-rail shall impart pivotal movement to the legs and vice versa.

5. A folding bed, comprising an upright portion having a base, a head-rail section pivoted to the upright portion, a foot-rail section pivoted to the head-rail section, a break-joint brace between the base and the pivoted head-rail and foot-rail sections, legs pivoted to the foot-rail section, means connected to the brace and having a slidable connection with the legs, a foot-rail pivoted to the foot-rail section, means whereby pivotal movement of the foot-rail shall impart pivotal movement to the legs, and a mattress-bar carried by the pivoted foot-rail.

6. A folding bed, comprising an upright portion having a base, a head-rail section pivoted to the upright portion, a foot-rail section pivoted to the head-rail section, a break-joint brace between the base and the pivoted head-rail and foot-rail sections, legs pivoted to the foot-rail section, means connected to the brace and having a slidable connection with the legs, a foot-rail pivoted to the foot-rail section, means whereby pivotal movement of the foot-rail shall impart pivotal movement to the legs, and means to lock the legs in their opened position.

7. A folding bed, comprising an upright portion having a base, a head-rail section pivoted to the upright portion, a foot-rail section pivoted to the head-rail section, a break-joint brace between the base and the pivoted head-rail and foot-rail sections legs pivoted to the foot-rail section, means connected to the brace and having a slidable connection with the legs, a foot-rail pivoted to the foot-rail section, means whereby pivotal movement of the foot-rail shall impart pivotal movement to the legs, and means movable with the foot-rail to limit its folding movement by engagement with the foot-rail section.

8. In a folding bed, the combination of a head-rail section, a foot-rail section having a drop-joint connection therewith, legs pivoted to the foot-rail section, a foot-rail pivoted to the foot-rail section, and links pivotally connecting the foot-rail and the legs.

9. In a folding bed, the combination of a head-rail section, a foot-rail section having a drop-joint connection therewith, legs pivoted to the foot-rail section, a foot-rail pivoted to the foot-rail section, links pivotally connecting the foot-rail and the legs, and a front suitably pivoted at one end and having a pin-and-slot connection at its other end with said legs.

10. In a folding bed, the combination of a

head-rail section, a foot-rail section having a drop-joint connection therewith, legs pivoted to the foot-rail section, a foot-rail pivoted to the foot-rail section, links pivotally connecting the foot-rail and the legs, and a front suitably pivoted at one end and having a pin-and-slot connection at its other end with said legs and also at such end having a sliding relation with the foot-rail section.

11. In a folding bed, the combination of a head-rail section, a foot-rail section having a drop-joint connection therewith and having longitudinal grooves at its foot end, legs pivoted to the foot-rail section, a foot-rail pivoted to the foot-rail section, links pivotally connecting the foot-rail and the legs, a front suitably pivoted at one end and having a pin-and-slot connection at its other end with said legs, and arms carried by the front and engaging the grooves of the foot-rail section.

12. In a folding bed, the combination of a head-rail section, a foot-rail section having a drop-joint connection therewith and provided with longitudinal grooves at its foot end and with a cross-bar at such end, legs attached to the foot-rail section, and a front suitably pivoted at one end and provided with arms engaging the grooves of the other end and adapted when the bed is open to bear against said cross-bar.

13. In a folding bed, the combination of a head-rail section, a foot-rail section having a drop-joint connection therewith and provided with longitudinal grooves at its foot end and with a cross-bar at such end, legs attached to the foot-rail section, a front suitably pivoted at one end and provided with arms engaging the grooves of the other end and adapted when the bed is open to bear against said cross-bar and having a slidable pivotal connection with said legs, a foot-rail pivoted to the foot-rail section, and links pivotally connecting said foot-rail with the upper ends of said legs.

14. A folding bed, comprising an upright portion having a base, a head-rail section pivoted to the upright portion, a foot-rail section pivoted to the head-rail section and provided with legs, links pivotally depending from the head-rail section and adapted to swing toward and from the upright portion, a transverse bar rigidly connecting the said links and adapted to swing with them, and links pivoted at their upper ends to the first-named links and at their lower ends to the base.

15. A folding bed, comprising an upright portion having a base, a head-rail section pivoted to the upright portion, a foot-rail section pivoted to the head-rail section and provided with pivoted legs, links pivotally depending from the head-rail section, a rigid connection between said links, links pivoted at their upper ends to the first-named links and at their lower ends to the base, a front rigid with the links connected to the base and having a sliding connection with the foot end of the foot-rail section, and a sliding pivotal connection with said legs.

16. A folding bed, comprising an upright portion having a base, a head-rail section pivoted to the upright portion, a foot-rail section pivoted to the head-rail section and provided with pivoted legs, links pivotally depending from the head-rail section, a rigid connection between said links, links pivoted at their upper ends to the first-named links and at their lower ends to the base, a front rigid with the links connected to the base and having a sliding connection with the foot end of the foot-rail section and a sliding pivotal connection with said legs, a foot-rail pivoted to the foot-rail section, and links pivotally connecting the foot-rail with the upper ends of the legs.

17. A folding bed, comprising an upright portion having a base, a head-rail section pivoted to the upright portion, a foot-rail section pivoted to the head-rail section and provided with pivoted legs, links pivotally depending from the head-rail section, a rigid connection between said links, links pivoted at their upper ends to the first-named links and at their lower ends to the base, a front rigid with the links connected to the base and having a sliding connection with the foot end of the foot-rail section and a sliding pivotal connection with said legs, a foot-rail pivoted to the foot-rail section, links pivotally connecting the foot-rail with the upper ends of the legs, and means rigid with the foot-rail section to hold the legs from swinging outward when the bed has been folded a predetermined distance.

18. In a folding bed, the combination of an upright portion having a base, a head-rail section pivoted thereto, a foot-rail section pivoted to the head-rail section and provided with pivoted legs, a break-joint brace between the base and the head-rail section, a front rigid with the lower portion of said brace and having a pivotal and sliding connection with the foot-rail section and adapted to move toward the latter as the bed is folded, guides carried by the foot-rail section, cross-bars suspended from the sides of the foot-rail section and movable perpendicularly through but in said guides, and springs carried by said cross-bars.

In testimony whereof I affix my signature in the presence of two witnesses.

JOHN L. TANDY.

Witnesses:
H. C. RODGERS,
G. Y. THORPE.