Feb. 7, 1933. R. COOPERSMITH 1,896,288

FOLDING CLOSET BED

Filed May 27, 1929 5 Sheets-Sheet 1

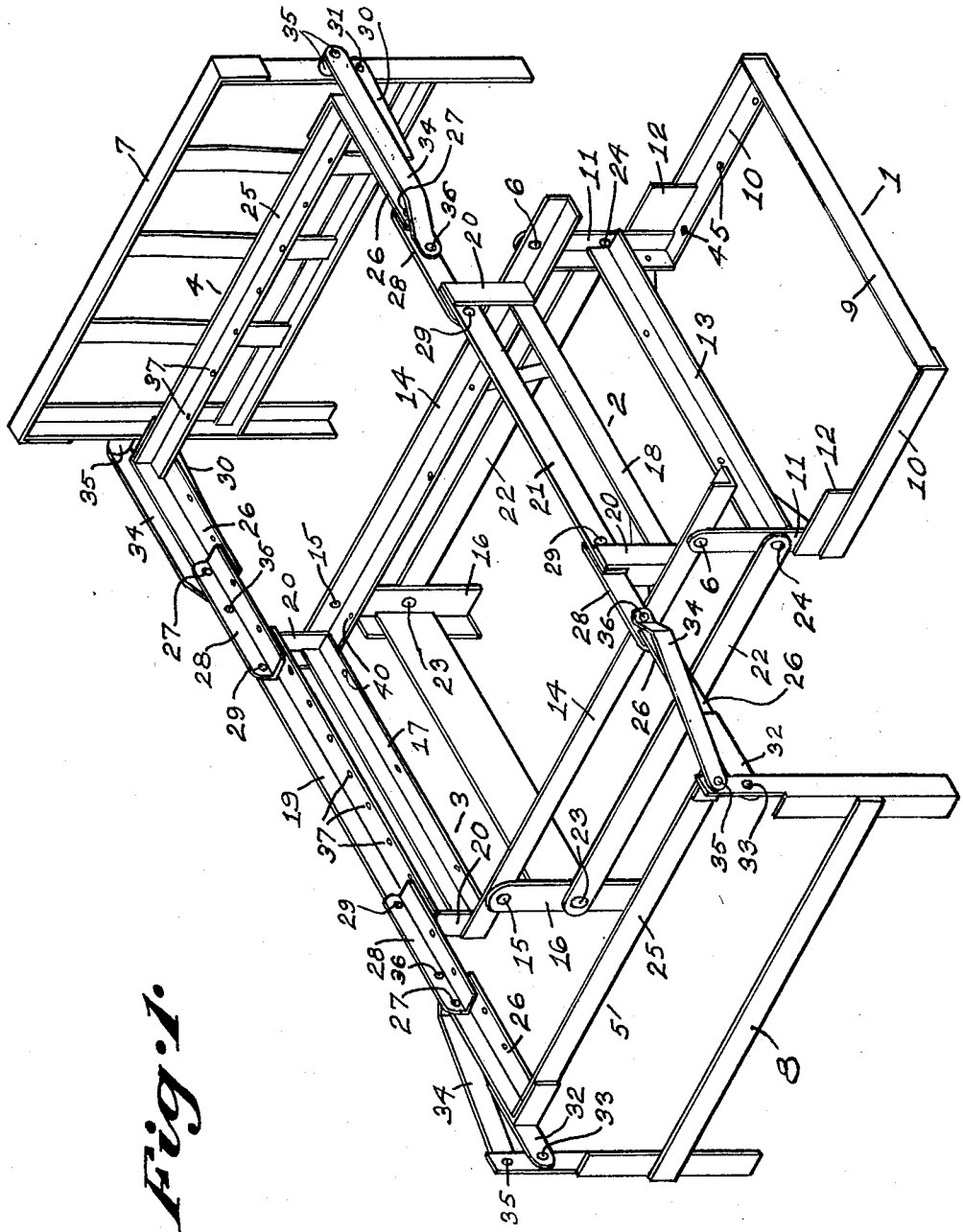


Fig. 1.

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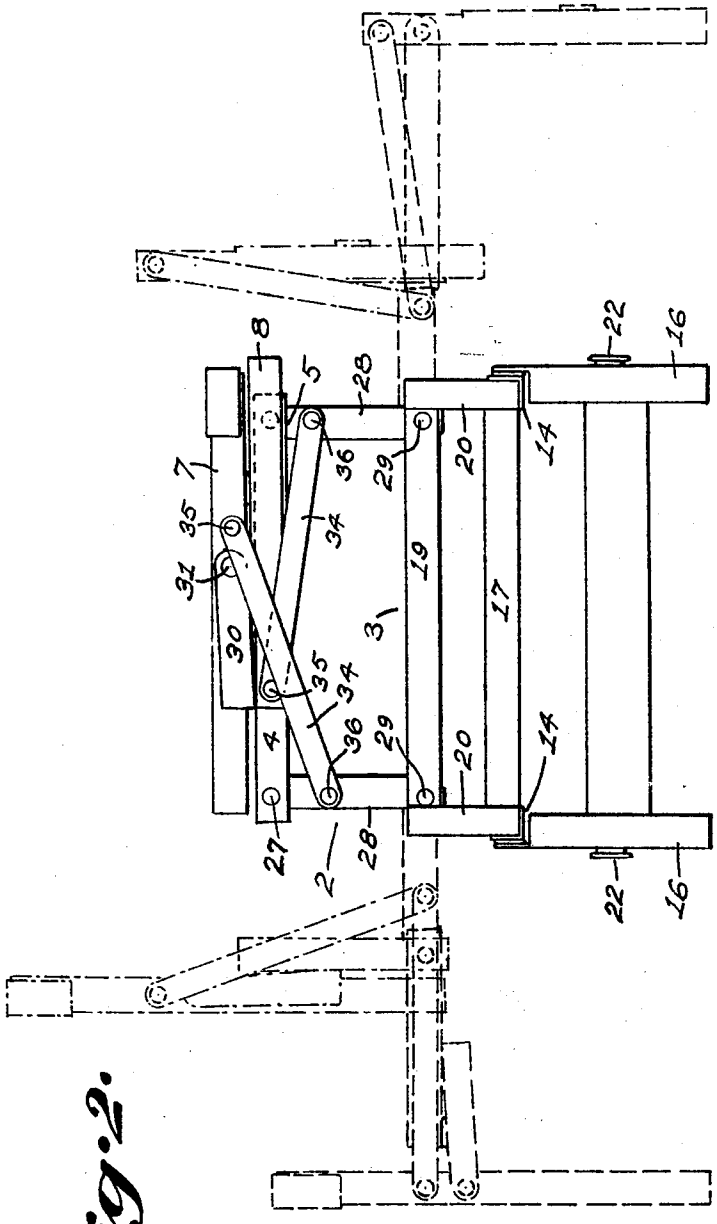


Fig. 2.

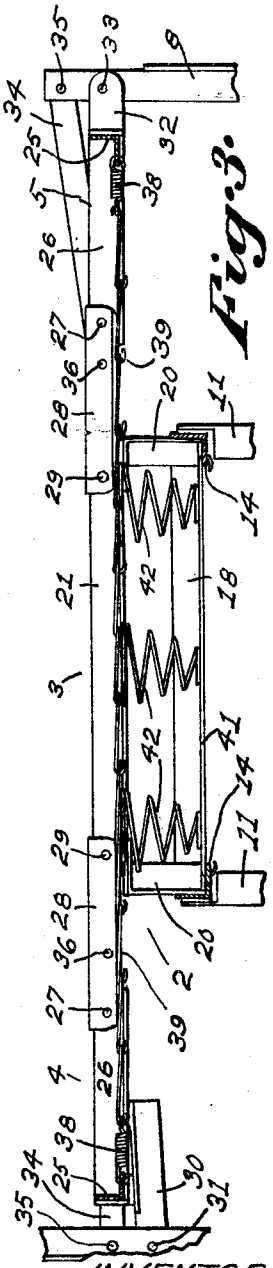


Fig. 3.

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Filed May 27, 1929 5 Sheets-Sheet 3

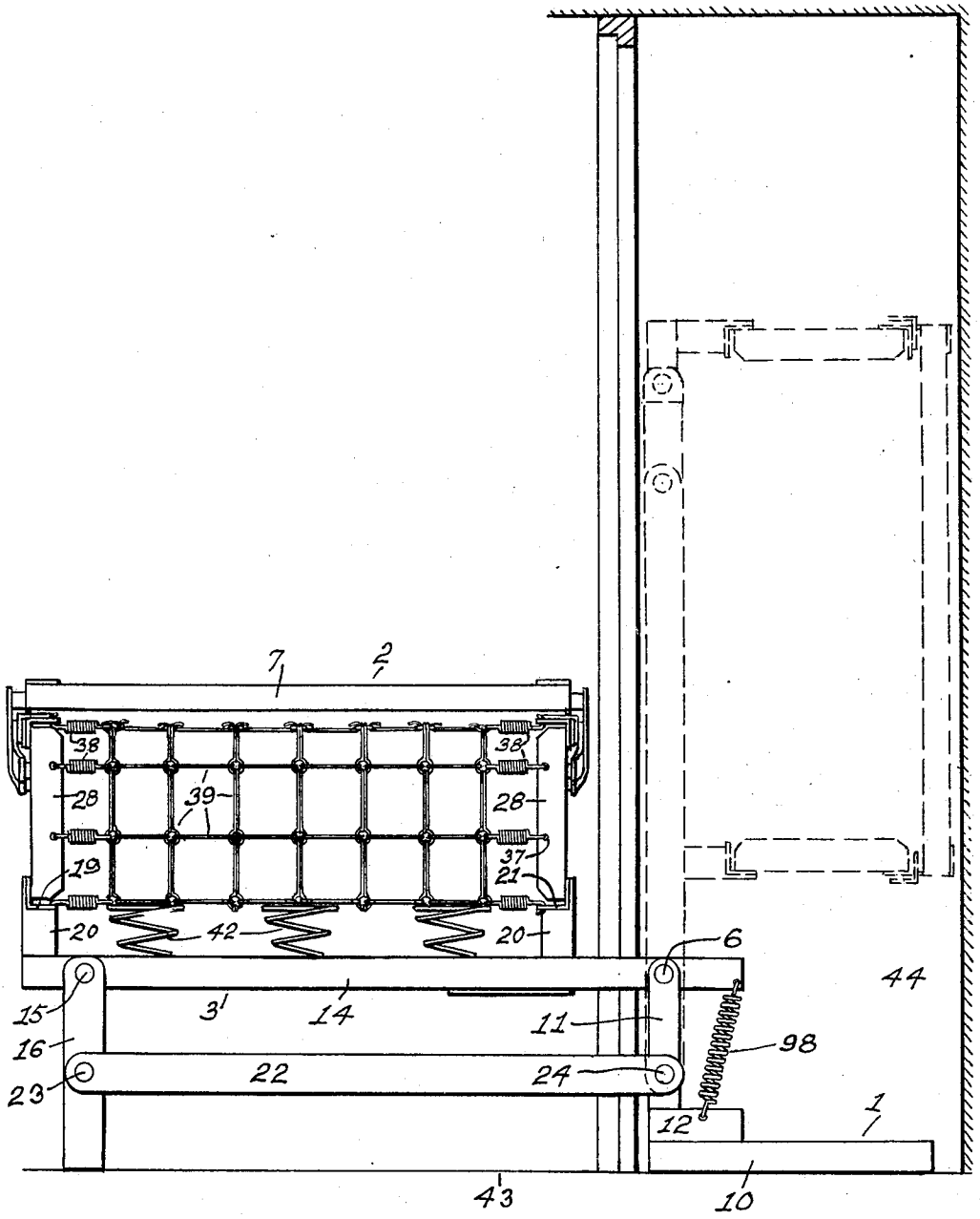


Fig. 4.

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Feb. 7, 1933. R. COOPERSMITH 1,896,288

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Filed May 27, 1929 5 Sheets-Sheet 4

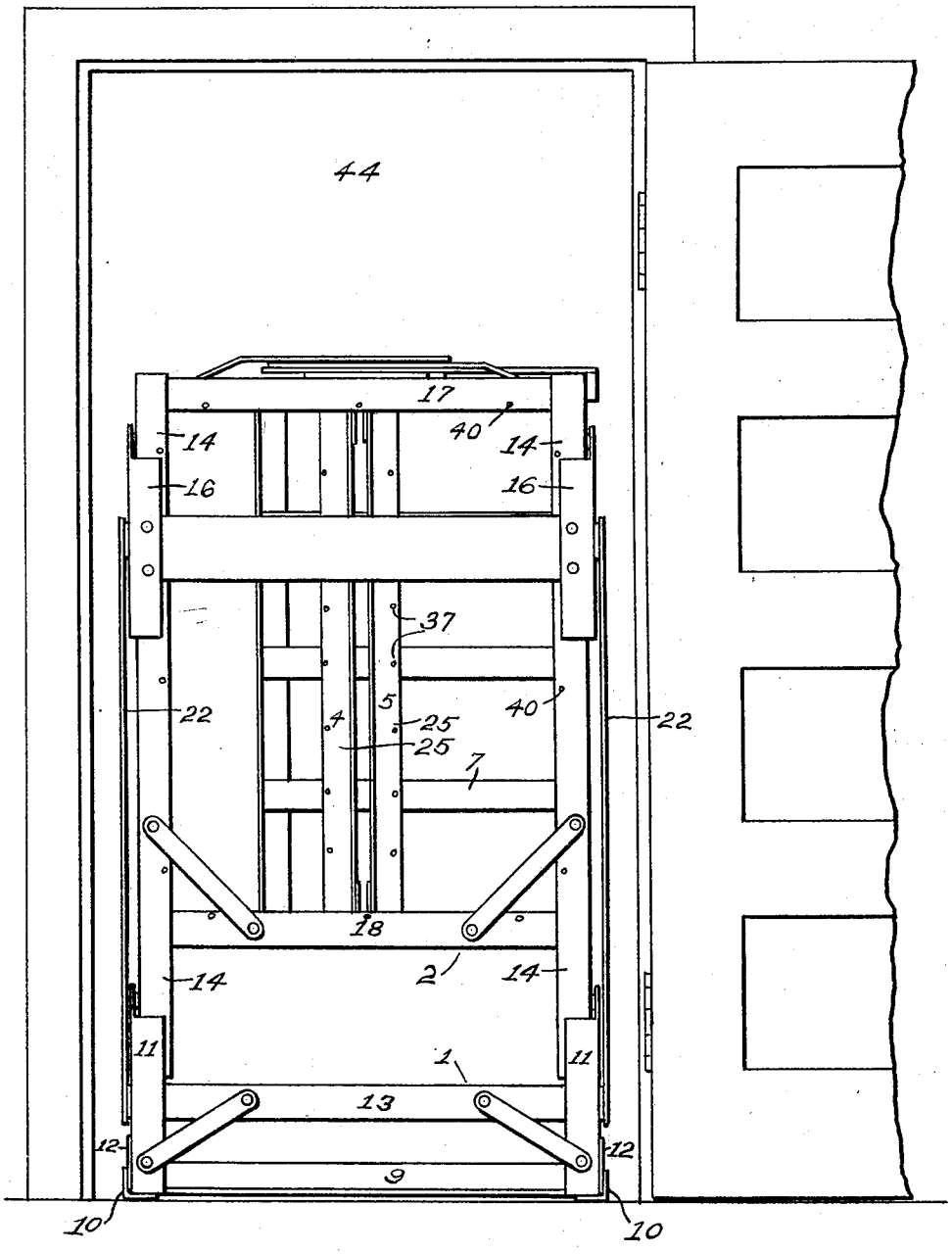


Fig. 5.

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Feb. 7, 1933. R. COOPERSMITH 1,896,288

FOLDING CLOSET BED

Filed May 27, 1929 5 Sheets-Sheet 5

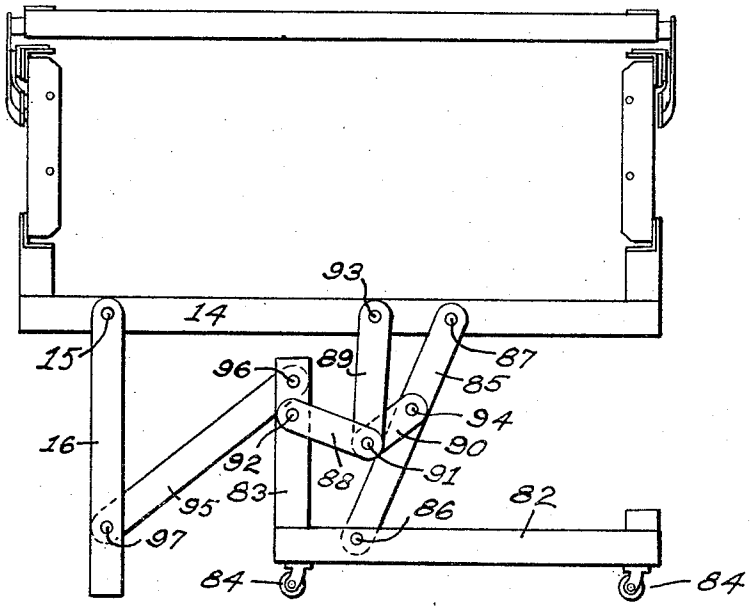


Fig. 6.

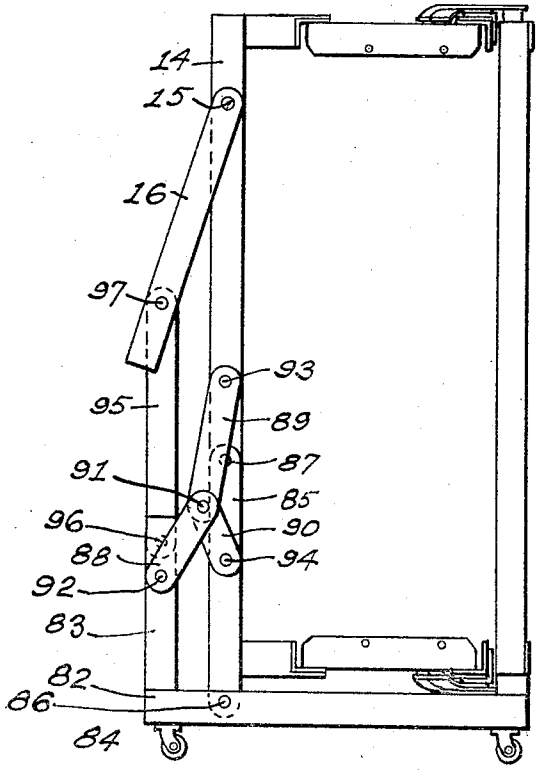


Fig. 7.

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Patented Feb. 7, 1933 1,896,288

UNITED STATES PATENT OFFICE

RUDOLPH COOPERSMITH, OF ST. LOUIS, MISSOURI

FOLDING CLOSET BED

Application filed May 27, 1929. Serial No. 366,296.

This invention relates to beds, and more particularly to a bed adapted, when not in use, to be collapsed or folded into a compact form and retracted into a recess in the wall, which is usually provided with a door to conceal the bed in the recess. Prior to the present invention, such recess-beds had been placed in the recesses with their widths extending in the direction of the width of the recess, and the bed had, therefore, to be limited to sizes narrower than the recess, thereby precluding the use of double beds in single-bed recesses. In expensive city apartments, economy of space is a desideratum of great importance, and the use of narrow-bed recesses may provide additional space for other purposes. Accordingly, the principal object of the present invention is the provision of a bed which can be collapsed or folded so that it will be accommodated by a recess narrower than the width of the bed.

Another object is the provision of a bed which can be collapsed as stated without unduly increasing its height, since collapsed or folded beds of undue height are more unwieldy and dangerous to open or unfold than folded or collapsed beds of moderate height, particularly when the bed is one that is borne by a carriage that can be rolled from the recess to any desired part of the bed room.

Other objects, advantages, and desirable features of the invention, chiefly more or less ancillary to the foregoing, will appear in the course of the following description of divers illustrative embodiments of the spirit of the invention.

In the accompanying drawings forming part of this specification, in which like numbers of reference denote like parts wherever they occur,

Figure 1 is a perspective view of one form of the invention, showing the bed as it appears when fully extended for use and without being associated with a recess, the fabric and cushioning springs being omitted;

Figure 2 is an elevation showing that side of the bed that is remote from the recessed wall, the full-line representation showing the bed as being still in horizontal position, but contracted in the direction that corresponds to the width of the recess when the bed has been withdrawn thereinto, while the broken line represents the parts fully extended, and the broken-and-dotted line indicates an intermediate position between the full line and the broken line positions;

Figure 3 is a fragmentary vertical longitudinal central sectional view of the fully extended bed;

Figure 4 is an elevation looking at the bed contracted as represented by the full lines of Figure 2 and in the direction of the arrow 4 in said figure; the broken lines indicating the same completely horizontally contracted and withdrawn into the recess;

Figure 5 is a view looking toward the recess and the fully collapsed bed therein;

Figure 6 is a view similar to Figure 4, but exhibiting a modified base and manner of pivoting the bed thereto; and

Figure 7 is a similar view of the same bed completely folded.

The form of bed illustrated in Figures 1 to 5 inclusive comprises a base or supporting frame 1, and a bed bottom frame 2 that is formed longitudinally of an intermediate section 3, a head end section 4, and a foot end section 5, the intermediate section 3 being pivotally connected to the base at 6 on an axis parallel to and adjacent to the rear side of the intermediate section 3. The bed may also include a head rest 7 and a foot rest 8. The base 1 preferably comprises a rear angle bar 9, side angle bars 10, upright angle bars 11 secured to the front ends of the side bars 10, plates 12 intermediating the side bars 10 and upright bars 11 to brace the connection between them, and a front angle bar 13 connecting the intermediate portions of the upright bars 11. The several bars of the base are rigidly attached together in any suitable manner, as by riveting, welding or brazing, as are also component bars of each of the several movable sections that comprise the bed frame. The intermediate section 3 preferably comprises transverse angle bars 14, pivoted adjacent their rear extremities at 6 to the upper extremities of the base uprights 11, and pivoted adjacent their forward ex-

tremities at 15 to legs 16. The forward extremities of bars 14 are rigidly connected to a front side lower angle bar 17; and at points just forward of the pivots 15 the bars 14 are rigidly connected to a rear side lower angle bar 18. An upper front side angle bar 19 is rigidly connected at its extremities to the lower front angle bar 17 by upright angle bars or spacers 20; and an upper rear side angle bar 21 is rigidly connected at its extremities to the lower rear angle bar 18 by similar spacers 20. Links 22 have one end pivotally connected at 23 to intermediate portions of the legs 16; and have their opposite ends pivotally connected at 24 to intermediate portions of the base uprights 11, whereby these elements, in conjunction with the transverse angle bars 14, form a parallelogram that maintains the legs 16 vertical or parallel to the uprights 11, so that when the intermediate section 3 is tilted to a vertical position about the pivots 6, the legs 16 will be collapsed automatically against the intermediate section 3. The end sections 4 and 5 each comprise end angle bars 25 having their extremities rigidly secured to inwardly extending side angle bars 26. The inner extremities of bars 26 are pivoted at 27 to the adjacent extremities of angle bar links 28; and the inner extremities of angle bars 28 are pivoted at 29 to the adjacent extremities of upper angle bars 19 and 21 of the intermediate bed section 3. Head end section 4 has rigidly attached thereto, on opposite sides thereof, outwardly extending arms 30, whose extremities are pivoted at 31 to the sides of the head rest 7. Foot end section 5 has rigidly attached thereto, on opposite sides thereof, outwardly extending arms 32, whose extremities are pivoted at 33 to the sides of the foot rest 8. Links 34, having one extremity pivoted at 35 to their respective end rests, and their opposite extremities pivoted at 36 to their respective links 28, function to collapse the rests 7 and 8 against the undersides of their respective adjacent end sections 4 and 5 when the rests are lifted to turn the end sections 4 and 5 upwardly on the pivots 27. The said links also maintain the rests in a vertical position when the end sections are extended as in Figure 1. The horizontal flanges of the sections 4 and 5, of the links 28 and of the intermediate section bars 19 and 21 are apertured at intervals as at 37 to receive the ends of the springs 38 of the usual wire fabric 39, adapted to receive the mattress, as shown in Figures 3 and 4. The horizontal flanges of beams 14, 17, and 18 are also apertured at intervals as at 40 for the attachment thereto of strands 41 of steel wire or other suitable material to form supports for the coiled conical cushioning springs 42 that reinforce the underside of that portion of the fabric 39 that lies above the intermediate section 3.

The construction of the bed having been fully described, the manner of collapsing or extending it will be readily understood. The base of the bed is bolted to the floor 43 of a closet or recess 44, the horizontal flanges of the angle beams 9 and 10 being apertured at intervals as at 45 for the reception of the screws that enter the floor to hold the base thereto. To collapse the bed from the extended position indicated by broken lines in Figure 2, the foot rest 8 is lifted, tilting the end section 5 on the pivots 27 unitl it assumes a vertical position as shown in the broken-and-dotted line represenation, the foot rest or support 8 being simultaneously and automatically folded against the end section 5 by reason of the functioning of the links 34. Further movement about the pivots 27 is limited by reason of the abutment of the adjacent ends of links 28 against the transverse flanges of angle bars 26; and the end section 5, foot rest 8 and links 28 turn together on the pivots 29 as the lifting of rest 8 is continued, until they occupy the position shown in full lines in Figure 2, further movement being limited by reason of the abutment of the adjacent ends of links 28 against the transverse flanges of the angle bars 19 and 21. The head rest 7 is then collapsed in the same manner, passing from the position represented by broken lines through the position indicated by broken-and-dotted lines to the position exhibited by the full lines in Figure 2, in which the head rest 7 overlies the foot rest 8, and the respective end sections underlie the rest and meet at their adjacent upper ends. The front side of the bed, or the side shown at the left in Figure 4, is then lifted until the bed frame assumes the vertical position within the recess 44, as indicated in broken lines, the legs or auxiliary supports 16 being collapsed automatically. In folding the bed, the other end of section 4 is received between the projecting arms 32 and legs 8, the inwardly projecting flanges of the latter being cut away far enough below pivots 33 to permit this.

It will be observed that the extended bed of Figure 1 is contractible longitudinally or in the direction of the width of the recess by folding the end sections over the intermediate section, and is also contractible laterally or in the direction of the depth of the recess by tilting the intermediate section laterally on its pivotal axis 6, in contradistinction to prior types of recess beds which were not contractible in the direction of the width of the recess, so that a wide bed could be accommodated by a correspondingly wide recess only. Furthermore, the lateral tilting of the bed on its base does not increase its height as much as if the bed were tilted longitudinally, so that the completely folded bed is more compact and much more easily handled than one that must be folded on its base on a transverse axis. It will be observed fur-

ther that the links 28 function also to space the end sections 4 and 5 a substantial distance above the intermediate section 3 when the bed is folded as shown in full lines in Figure 2, thereby providing a space for the folded mattress between the folded sections. Attention is also directed to a substantial space that is provided between the base and the superposed bed frame when the latter is folded to the vertical position indicated by the broken lines in Figure 4. This space is very convenient for storing pillows, bedclothes, and the like. It is also worthy of note that the legs 16 and the legs or supports 7 and 8 are automatically retracted when the bed is collapsed.

It will be understood and appreciated that the divers forms of the invention hereinbefore described may be provided with any suitable type of base that may be either rigidly affixed to the floor of the recess or provided with suitable castors to enable the bed to be rolled out of the recess to any desired part of the room. The rigid or stationary type of base has the bed frame pivoted thereto in such manner that when the bed is opened the bed frame will be projected forward in horizontal spaced relation to the base, or entirely outside of the recess, as shown in Figure 4. Otherwise stated, the open bed frame does not overlie the base. However, when the base is of the portable or carriage type, it is preferable so to pivot the bed frame to the base that the frame completely overlies the base or carriage, chiefly for the sake of appearance and compactness when the bed is opened completely. Figures 6 and 7 illustrate one such mode of pivotally supporting the bed frame on the base and will now be described. The base 82 has rigidly secured to its anterior corners the uprights or posts 83; and on its underside carries in any suitable or usual manner the castors 84. The base 82 underlies the bed frame when the bed is fully open as well as when it is fully closed or folded; and folding mechanism is interposed between the bed frame and base that will enable the bed to be folded so as to fulfill these conditions, as well as to transmit that portion of the weight of the bed borne by such folding or connecting mechanism to a portion of the base 82 intermediate of the points of bearing of the front and rear castors 84 on the floor. Such mechanism comprises a link 85 pivoted at 86 adjacent its lower extremity to a portion of the base 82 intermediate of the front and rear castors 84 and pivoted at 87 adjacent its upper extremity to an intermediate portion of the bottom frame beam 14. Links 88, 89, and 90 are pivoted together on a common axis 91 in star-shape fashion, and the opposite ends of these links are pivoted respectively to the posts 83, beam 14 and intermediate portion of link 85 at the points 92, 93, and 94, respectively.

It will be observed that that portion of the weight of the bed borne by the pivot 87 is transmitted to an intermediate portion of the base in the same vertical line, thereby insuring the stability of the base 82 under the load transmitted thereto through the link 85. However, in order to fold the bed to the vertical position directly over the base 82 as shown in Figure 7, it is necessary to shift the pivot 87 toward the left or forwardly, and this shifting of the pivot 87 and link 85 is effected by the link 89 in raising or lowering the pivot 91 to shift the toggle links 88 and 90. Link 95, pivoted at 96 to post 83, and at 97 to auxiliary support or leg 16, functions to retract the leg 16 automatically when the bed is tilted to the vertical closed position of Figure 7. It will, of course, be obvious that the foregoing link mechanisms are preferably applied to opposite sides of the base, although only one side is illustrated herein. A further advantage of the link mechanism of Figures 6 and 7 is that the pivot 87 is located at an intermediate portion of the beam 14, so that the portion of the bed to the right of pivot 87 acts as a counterweight for the portion of the bed at the left of pivot 87, thereby facilitating the tilting of the bed on the pivot 87. This is an advantage over the form illustrated in Figure 1, in which the entire bed lies on one side only of the pivot 6, although, of course, if desired, springs 98 may be pivoted under tension at one end to the rear extremity of beams 14 and at the other end to the plates 12, in order to counterbalance the weight of the bed to facilitate the tilting of the bed, as shown in Figure 4.

Having thus fully described this invention, I hereby reserve the benefit of all changes in form, arrangement, order, or use of parts, as it is evident that many minor changes may be made therein without departing from the spirit of this invention or the scope of the following claims.

I claim:

1. A bed comprising a support, an intermediate frame section pivoted to said support at a point above the level of the base thereof, end sections pivotally connected with the ends of the intermediate section and foldable thereover to lie in the same horizontal plane. supports pivoted to the end sections and adapted to hold the end sections in alinement with the intermediate section, one of said supports adapted to fold upon the end section attached thereto in nested relation and the other support adapted to fold upon the end section attached thereto in parallel juxtaposition thereto and in superposition to the said one support.

2. A bed comprising a support, an intermediate frame section pivoted to said support at a point above the level of the base

thereof, end frame sections, links interposed between the intermediate and end sections and pivotally connecting the ends of the intermediate section and the adjacent ends of the end sections for folding the latter over the intermediate section to lie in the same horizontal plane, and supports pivoted to the end sections, one of said supports adapted to fold upon the end section attached thereto in nested relation, the other support adapted to fold upon its attached end section in parallel juxtaposition thereto and in superposition to the said one support.

3. A bed comprising a support, an intermediate section pivoted to one side thereof so as to be foldable vertically of said support, an auxiliary support pivoted to said section, means for collapsing said auxiliary support toward said section as the same is folded vertically, end sections pivotally connected with the ends of the intermediate section and foldable thereover to lie in the same horizontal plane, and end supports pivoted to the end sections, one of said end supports adapted to fold upon the end section attached thereto in nested relation, and the other end support adapted to fold upon its attached end section in parallel juxtaposition thereto and in superposition to the said one end support.

4. A bed comprising a support, an intermediate section pivoted to one side thereof so as to be foldable vertically of said support, an auxiliary support pivoted to said section, means for collapsing said auxiliary support toward said section as the same is folded vertically, end sections pivotally connected with the ends of the intermediate section and foldable thereover to lie in the same horizontal plane, and end supports pivoted to the end sections, one of said end supports adapted to fold upon the end section attached thereto in nested relation, and the other end support adapted to fold upon its attached end section in parallel juxtaposition thereto.

In testimony whereof I hereunto affix my signature.

RUDOLPH COOPERSMITH.