United States Patent

Bartz

[15] **3,636,573**

[45] **Jan. 25, 1972**

[54] FOLDABLE MATTRESS SUPPORT

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[73] Assignee: **Con-Tex Corporation,** Milwaukee, Wis.

[22] Filed: **Jan. 29, 1970**

[21] Appl. No.: **6,909**

[52] **U.S. Cl.** **5/69,** 5/327

[51] **Int. Cl.** **A61g 7/00,** A47c 22/00

[58] **Field of Search** 5/66–69, 317, 327

[56] **References Cited**

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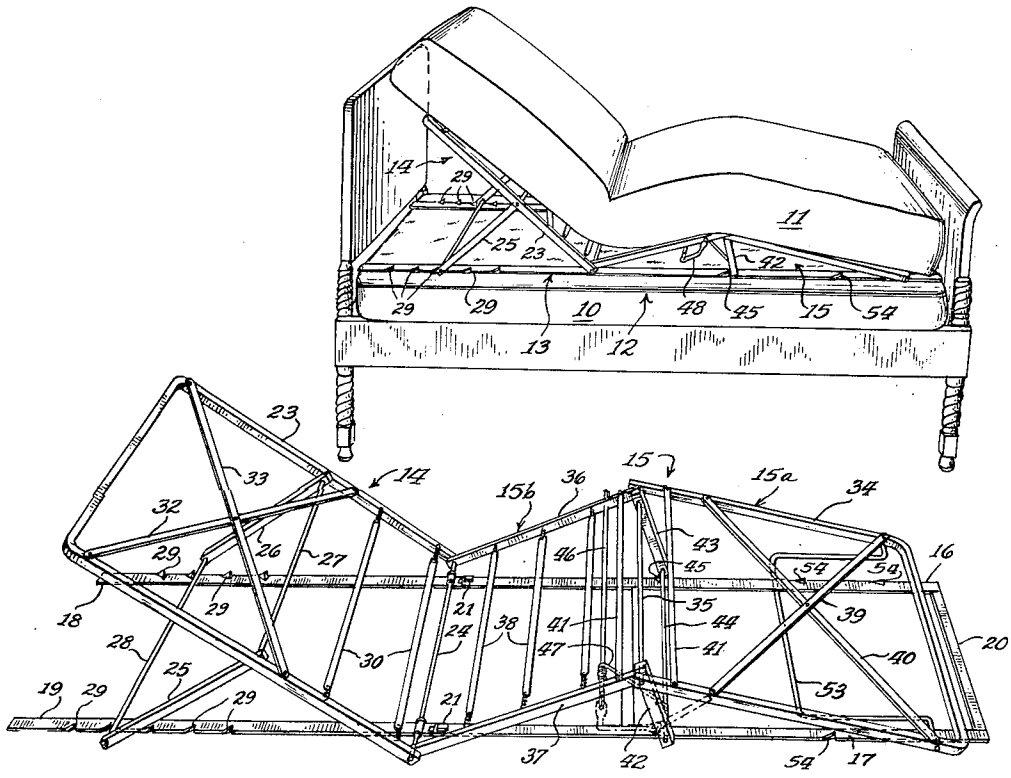
[57] **ABSTRACT**

A lightweight, foldable mattress support frame with head and foot sections insertable between a mattress and a box spring support. Head and foot sections are pivotally connected and manipulated between a flat position and positions at selected angular dispositions. Flexible straps interconnect marginal portions of the frame. Pivots between the head and foot sections provide a minimal amount of disturbance of a mattress supported on the frame between the marginal portions of the frame.

11 Claims, 11 Drawing Figures



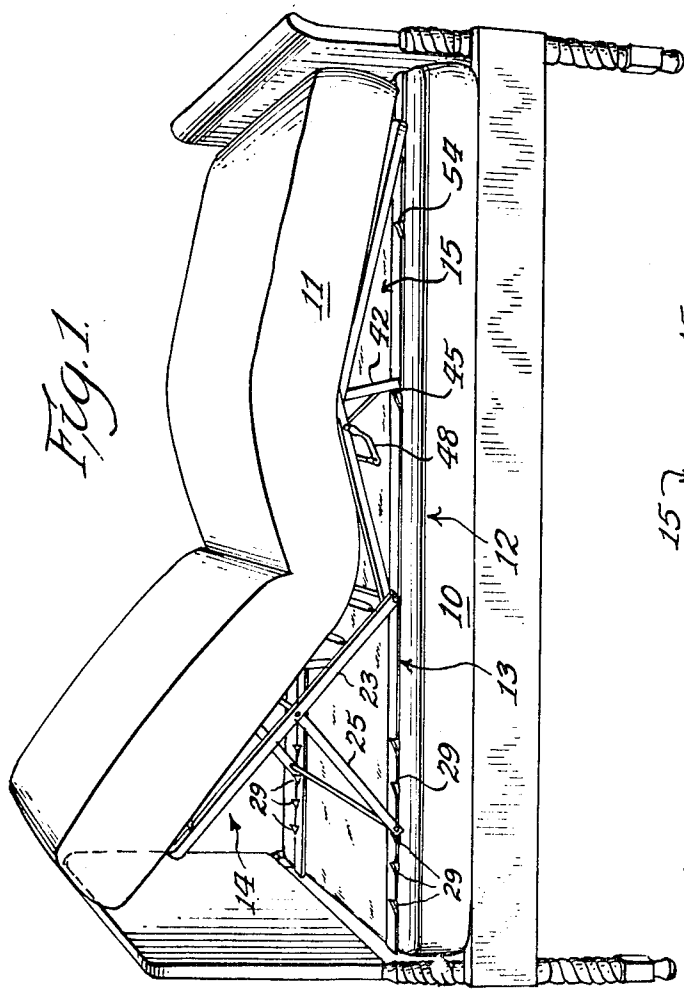


Fig. 1.

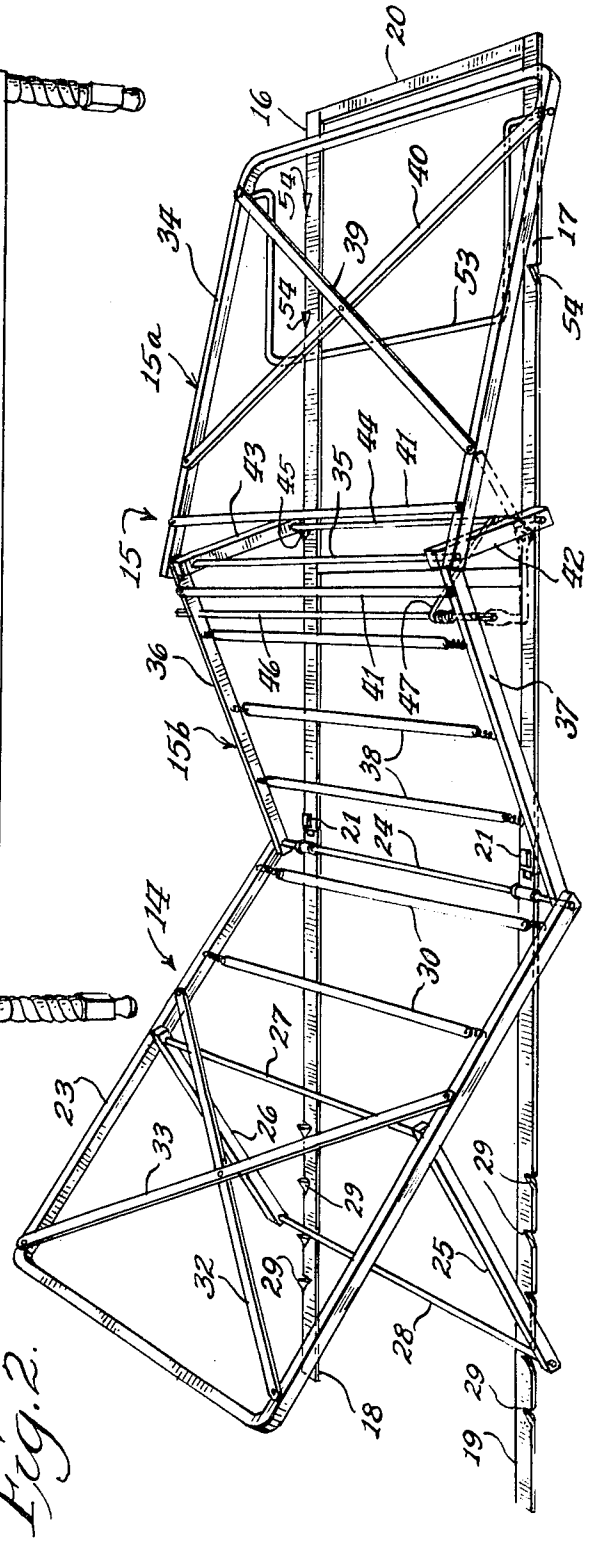


Fig. 2.

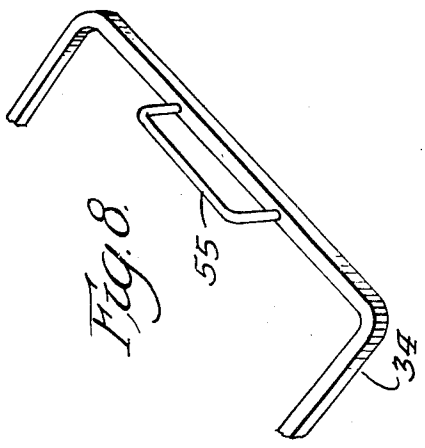


Fig. 8.

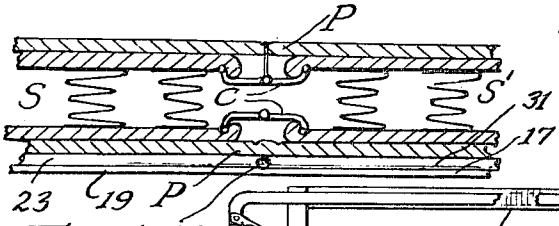


Fig. 11.

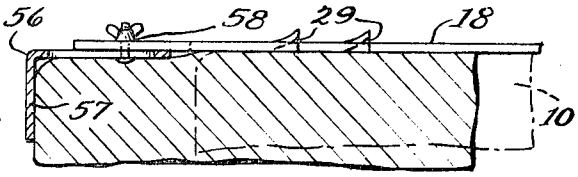


Fig. 10.

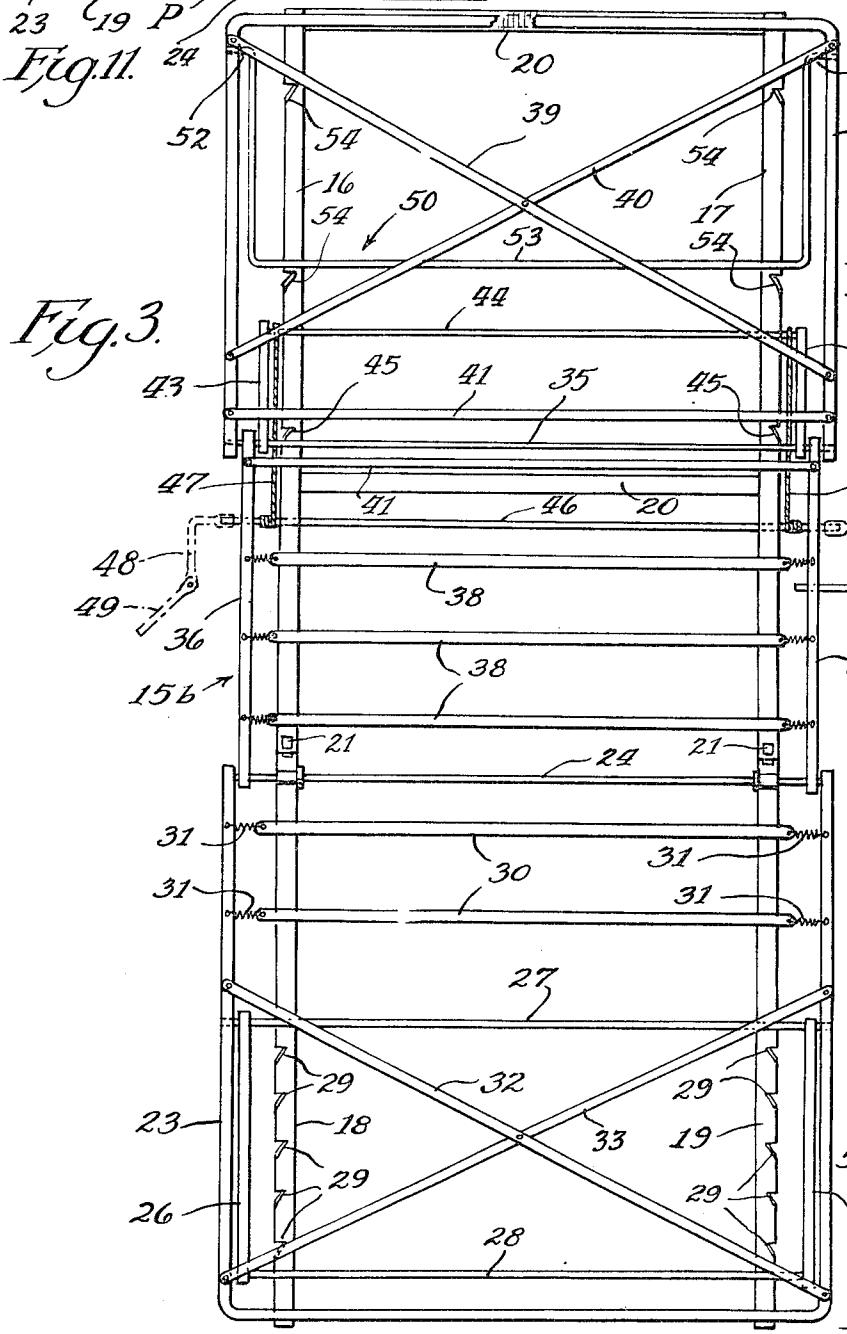


Fig. 3.

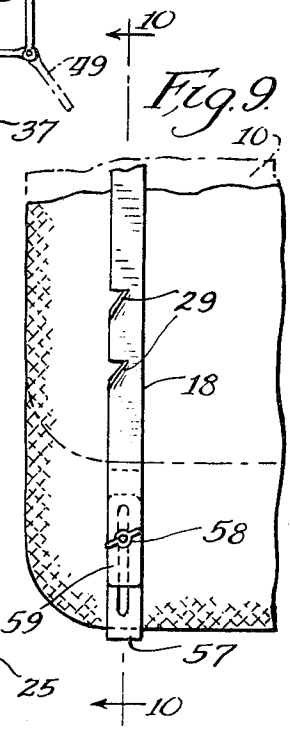


Fig. 9.

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Fig. 4.

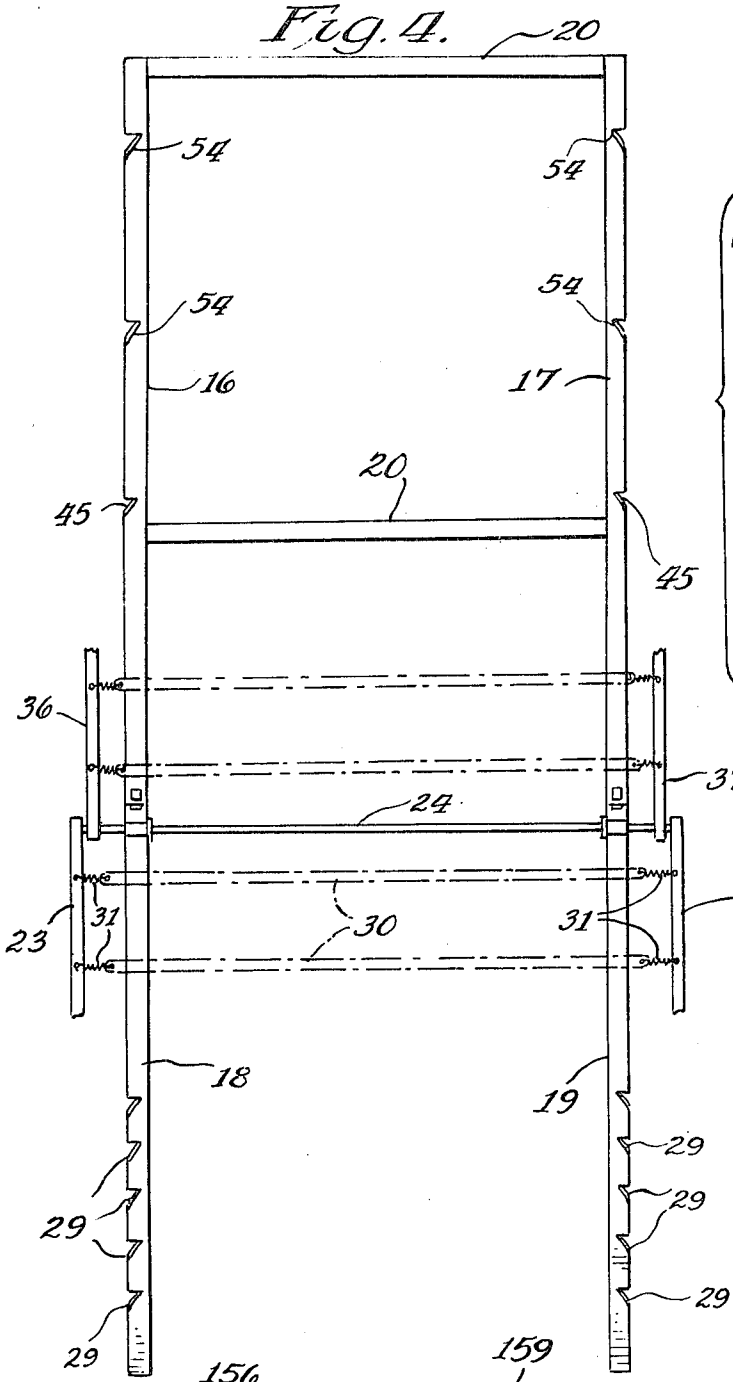
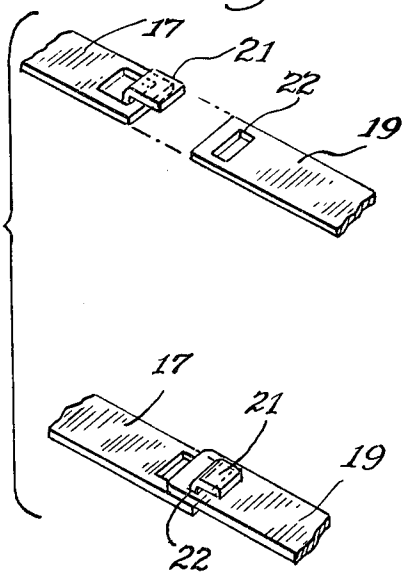


Fig. 5.



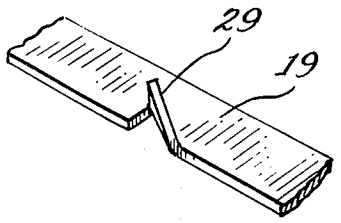


Fig. 6.

Fig. 7.

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FOLDABLE MATTRESS SUPPORT

The present invention is directed to improvements in mattress supports and is particularly concerned with improvements in lightweight frames which are hand manipulated for supporting head and foot sections of a mattress at selected angular dispositions.

The major purposes of the present invention are to create a foldable, lightweight and inexpensive mattress support in such a way that the support lies entirely within the sides of a superimposed mattress whereby the mattress and covering thereon substantially masks the appearance of the support beneath the mattress, to provide such a construction which is easily foldable into a relatively compact condition for storage and transport, to form such a support in a manner which will substantially minimize distortion of a superimposed mattress, to so form such a support that the normal cushion effect of the mattress is not substantially disturbed through the use of the support, and to so form such a support that the head and foot sections of the support are easily manipulated to various inclined positions and securely held in such positions. These and other purposes of the invention will be more apparent in the course of the ensuing specification and claims when taken with the accompanying drawings, in which:

FIG. 1 is a side view of a foldable mattress, bed and support assembly incorporating the present invention;

FIG. 2 is a perspective view of the support assembly illustrated in FIG. 1;

FIG. 3 is a plan view of the support assembly illustrated in FIGS. 1 and 2 and with the support assembly in a flat condition;

FIG. 4 is a plan view of a portion of the assembly illustrated in FIG. 3;

FIG. 5 is an exploded view of certain details of a supporting base illustrated in FIG. 4;

FIG. 6 is a detailed view of certain projections utilized in the base illustrated in FIG. 4;

FIG. 7 is a side view of a foot section of the support illustrated in FIGS. 1, 2 and 3;

FIG. 8 is a perspective view of a modification which may be used in the invention;

FIG. 9 is a plan view of certain base details which may be utilized in the invention;

FIG. 10 is a side view of the base details illustrated in FIG. 9; and

FIG. 11 is a side view, in section, of a portion of a preferred mattress and support assembly incorporating the principles of the present invention.

Like elements are designated by like characters throughout the specification and drawings.

With specific reference now to the drawings and in the first instance to FIG. 1, the numeral 10 generally designates a conventional box spring support for a mattress. The numeral 11 designates a hospital-type mattress construction which preferably is of the same type as that disclosed in my prior U.S. Pat. No. 3,354,477, issued on Nov. 28, 1967. The foldable mattress support of the present invention is generally designated at 12. The foldable mattress support 12 is adapted to lie essentially flat between the mattress 11 and spring support 10 and inwardly of the side of the mattress. It presents substantially no disturbance to the superimposed mattress in the flat position thereof as will be described more fully hereinafter. Support 12 is also formed so as to enable selected adjustment of sections of the support to enable inclination of head and foot sections of the mattress in a manner which will be pointed out more fully hereinafter.

In accordance with the present invention, the support is defined by a base generally designated at 13, and a head section 14 and foot section 15 mounted on said base. The base is defined by separable sections each of which is defined by spaced, elongated and flat plate elements 16 and 17, and 18 and 19, respectively. Suitable cross pieces 20 are fixed to and extend between the spaced and parallel base elements 16 and 17 to hold them in the spaced and parallel disposition. The

base section defined by the elements 16 and 17 and 20 are removably attached to the section define by the elements 18 and 19 as by tongue and slot connections 21, 22, respectively, as is seen in detail in FIG. 5.

Head section 14 is defined by a marginal tubular member 23 which is generally U-shaped and pivoted to a pivot rod 24 which is fixed to the head base section plates 18 and 19. The marginal side portions of member 23 are positioned so that they extend generally parallel to but outwardly of the baseplates 18 and 19.

A supporting leg assembly for the head section is defined by spaced and parallel members 25 and 26. It is pivotally mounted upon a rod 27 which extends generally parallel to rod 24 at a point approximately midway of the sides of head section member 23. The supporting leg assembly includes a rod 28 extending between and fixed to the ends of the members 25 and 26. The baseplates 18 and 19 include a plurality of spaced, upwardly extending projections 29 to provide abutments to hold rod 28 and thereby the support leg assembly at a selected position and thereby hold the head section 14 at a selected angular disposition relative to the base. Projections 29, as will be noted in FIG. 6 may be conveniently formed by simply punching or stamping portions of the baseplates 18 and 19 upwardly into a projecting relation. In lieu of stamping the projections 29 from the members 18 and 19, projections may be defined by separate members which are welded to the members 18 and 19. It should be noted that the members 25 and 26, as will be seen in FIG. 3, are positioned inwardly of the sides of the U-shaped marginal member 23 defining the outer extremities of the head section so that when the assembly is folded flat, these members as well as the rods 27 and 28, are entirely within the outline of the head section as viewed from the side, and, therefore, essentially coplanar therewith.

The head section includes a plurality of flexible straps 30 which extend parallel to one another and to the pivot rod 24. These flexible straps may be supported by springs as designated at 31, to provide a yieldable support in the area near the pivot rod 24, which is generally the seat and lower back supporting area of a superimposed mattress. Additional metal straps 32 and 33 may extend diagonally across the outer end of the marginal tubular member for additional support near the head region of the mattress. These straps 32 and 33 are fixed to the marginal member 23 and to one another. They are sufficiently light in weight as to provide some flexing when force is applied thereto while at the same time providing sufficient support for the outer end of the head section of the mattress between the sides of member 23.

In accordance with the invention, the foot section 15 of the support is divided into two subsections, namely an end subsection 15*a* and an intermediate subsection 15*b*. Each of these subsections 15 *a* and 15*b* is defined by tubular stock of the same type defining the marginal member 23. For example, a generally U-shaped member 34 defines the margin of the end subsection 15*a* and is pivoted, as by means of a pivot rod 35, to a pair of tubular members 36 and 37, which define the margins of the intermediate foot subsection 15*b*. Members 36 and 37 are pivoted on rod 24 at positions inwardly of the legs of the member 23.

Spring supported straps 38 are adapted to extend between the members 36 and 37 of the intermediate subsection and are of the same type as the spring supported straps 30 on the head section. Again, this provides some yieldability of support between the marginal members 36 and 37 in the seat and upper leg supporting portion of the mattress.

For more support, three or more straps 30 may be used in the inward area of the head section while four or five straps 38 may span the intermediate subsection.

The end subsection 15*a* preferably includes crossed metal straps 39 and 40, which are joined to the side of the marginal member 34 and to one another as is the case with the diagonal straps 32 and 33 for the head section. These straps again provide some flexibility of support while providing an overall area of support between the sides of the end subsection. Additional

metal straps 41 may be provided between the sides of the end subsection 15*b* and intermediate subsection 15*a* and near pivot rod 35 if desired.

A supporting leg assembly defined by spaced side members 42 and 43 and a connecting rod 44 is pivotally mounted on the pivot rod 35. Suitable means, not illustrated, may be provided for holding the pivot rod in position on the ends of member 34 while holding the marginal members 36 and 37 adjacent to the ends of member 34 and adjacent to the members 42 and 43 of the foot section supporting leg assembly. The supporting leg assembly is adapted to be moved between a flat position in which the members 42, 43 and connecting rod 44 are entirely within the projection outline of the marginal members 36, 37 and 34. The supporting leg assembly may, however, be pivoted to thereby elevate the intermediate foot subsection 15*b* and the end subsection 15*a* with the connecting rod 35 at an elevated position above the base whereupon rod 44 abuts against stops 45 on the baseplates 16 and 17.

A crank and cable winding assembly is provided for moving the supporting leg assembly from a flat position to the inclined position. This assembly includes a rod 46 rotatably mounted in the marginal members 36 and 37 and cables 47 fixed to the rod at opposite sides thereof and fixed to rod 44 at opposite sides thereof. Crank arms 48 may be removably attached to projecting ends of rod 46 as through suitable socket connections at each side of the supporting frame and with a handle 49 pivotally mounted on the end of each crank arm. When either handle 49 is extended outwardly from its associated crank arm 48 it may be used to rotate rod 46 and retract the cables 47 to thereby move the supporting leg assemblies out of a coplanar disposition with the foot subsections into a position wherein rod 35 is elevated above the base and with the foot subsections inclined to one another as illustrated in FIGS. 1 and 2. This assembly is so formed that one or both of the handles 49 may be swung inwardly into underlying relation with the marginal members 36 and 37 whereby extending forces on the cables 47 (due to superimposed weight) cause the handles 49 to abut against the members 36 and 37 and preclude rotation of the rod 46 and extension of the cables.

It should be noted that the abutments 45 may be omitted as long as the members 42 and 43 of the support leg assembly are not rotated to a position such that they are perpendicular to the base members 16 and 17. In other words, the abutments 45 may be omitted as long as the members 42 and 43, when used for elevating purposes, are always inclined to the base members 16 and 17. When so inclined, the resultant forces act against the cables 47 in an unwinding direction and, as long as the handles 49 prevent unwinding, the supporting leg assembly is securely held. It is, however, preferred to use the stops 45.

In lieu of using the cable 47, the members 42 and 43 may be fixed to rod 35 and a crank attached to rod 35 so that rotation of the crank changes the angular disposition of the members 42 and 43. The rod 35 is then rotatably received in the marginal members and suitable stop means are provided for holding the members in a selected angular disposition.

The end subsection 15*a* also carries an additional supporting leg assembly which consists of a U-shaped rod 50. This U-shaped rod has outwardly extended end portions 51 and 52 which are received in pivot apertures in the legs of the marginal member 34. The central portion of this rod 53 is adapted to be received against projections 54 in upstanding relation on the baseplates 16 and 17. Projections 54 may be of the same type as the projections 29 illustrated and described in FIG. 6. This support leg assembly 50 for the end foot subsection may be selectively positioned against a pair of the projections 54 so as to hold the end subsection 15*a* substantially parallel to the baseplates 16 and 17, as illustrated in FIG. 7, or at an upwardly inclined position, as selected by the user.

The end subsection may include an upwardly extending U-shaped rod structure 55 adapted to abut against the end face of the mattress so as to prevent the mattress from sliding forwardly on the foot subsection.

It is also preferred that one or both of the base sections include flange means which are adapted to overlie the end of the box spring to hold the base sections against slippage thereon. For this purpose the head section of the base may include straps 56, having down-turned flanges 57 for abutting relation with the end of the box spring. These plates may be adjustably positioned relative to the plates 18 and 19 as by means of screw-and-nut assemblies 58, which are passed through the plates 18 and 19 and through slots 59 in the plates 56. These flanged plates may thus be extended and retracted to fit varying lengths of mattresses. It is to be understood that such flanged plates may be carried at the ends of all of the baseplates 16, 17, 18 and 19.

By positioning the pivot rod 24 between the spring sections S and S′ of a mattress of the type disclosed in my aforesaid U.S. Pat. No. 3,354,477 as disclosed in FIG. 11, the rod provided causes substantially no distortion of the mattress at the area of folding movement of the mattress. The sections S and S′ are pivotally connected by U-shaped clips C with padding P overlying the spaces within the clips. Rod 24 then simply forces the padding P beneath the space which overlies the padding into the space without distortion of the spring sections. In this regard, the mattress may also include separate spring sections in spaced relation in overlying relation to the pivot rod 35 connecting the two subsections 15*a* and 15*b* of the foot section.

When using a support formed in accordance with the present invention, the user simply places the base and head and foot sections in a flat position over a suitable support such as is represented in the box spring illustrated in the drawings. The holding flanges of the head end of the base are brought snug against the head end of the box spring. If similar flanges are provided at the foot end of the base, these are adjusted also so that they are snug against the foot end of the box spring. The mattress in then superimposed on the frame. In the flat position of the frame, it will be noted that the head and foot sections, as well as the base, are positioned inwardly of the sides of the mattress so that the mattress and box spring essentially mask the support frame from view; and the inward positioning of the support frame represents a minimal amount of disturbance when suitable coverings are positioned over the mattress. The support as a whole does not substantially detract from the appearance of the mattress and box spring as an ordinary bed. Similarly, the support as a whole does not substantially affect the normal cushioning action of the mattress in either the flat or folded position. In both positions, the rigid areas of support are defined along and inwardly of the sides of the mattress by marginal members 23, 34, 36 and 37. Rigidly is also provided by rods 24, 46 and 35 but rod 24 may project toward the space between spring sections as in FIG. 11 and thus avoid distorting the mattress between the sides thereof. The transverse rigidity provided by rods 46 and 35 is in the knee supporting area of the mattress and greater rigidity is desirable in this area.

The flexible spanning straps 30 and 38 are in the mattress areas which support the human lower back, seat and thighs, and supporting flexure in this area is desirable. Relatively firmer support for the mattress is provided at the end of the head section and in the end foot subsection by the straps 32, 33, 39 and 40.

In the flat position of the support, the head and foot sections, as well as the supporting leg assemblies are coplanar with one another and thus present a flat support. The projections 29, 45 and 54 have a lesser height than the marginal members 23 and 34 and are positioned inwardly of these members. The projections are thus within the outline of the support when viewed from the side and they do not disturb the mattress.

When using the support herein to incline various portions of the mattress at selected angular dispositions, the user may simply grasp the head section and raise it to a selected angular disposition and position the support leg assembly therefor against a suitable projection 29. The weight of a person sup-

ported on the mattress will hold the support leg assembly for the head section securely against these projections and at the upwardly inclined position selected by the user.

The foot subsections are also easily elevated simply by rotating crank handle **49**, when the crank handle is in an outwardly extended position, until the support leg assembly for the foot section abuts against stop **45**. At this position, the actuating handle **49** for the crank is folded inwardly over or under the marginal portion of the foot section adjacent thereto, whereupon the crank is held against rotation. The cable or cables then hold the support leg assembly for the foot section against the stop **45**. The end subsection of the foot section may then be downwardly inclined, if so desired by the user. On the other hand, if the user desires to elevate the end subsection of the foot section, the support leg assembly **53** for the end subsection is then pivoted and moved into holding engagement with a selected projection **54**, thereby holding the end foot subsection at a selected height relative to the base and at a selected angular disposition relative to the intermediate subsection.

The support is easily returned to the flat position simply by moving the pivoted crank handle **49** to the outwardly extending position, whereupon the crank may be rotated to extend the cable and allow the supporting leg assembly for the foot section to move within the confines of the marginal members. When the crank handle is released, suitable weight on the foot subsections will more or less force the supporting leg assemblies into the flat and coplanar position as long as the other supporting leg assembly for the end foot subsection is positioned within the confines of the end foot subsection.

Both the head section and end foot section may be lowered by removing their respective supporting leg assemblies from engagement with the notches on the base whereupon the supporting leg assembly, the head section, and the end foot subsection may be easily lowered.

The support assembly is easily folded together with the base sections detached from one another so as to provide a relatively flat and compact package for transport or storage.

I claim:

1. A mattress and a support frame combination including a mattress defined by spaced, relatively foldable and connected separate spring sections disposed end to end with covering overlying said spring sections and the space between both ends of said sections, a mattress supporting frame underlying said mattress and means for supporting said frame, said frame being defined by a base and substantially flat foot and head sections pivotally mounted on said base, said head and foot sections being pivotally mounted on a pivot rod extending between spaced members defining said base, said pivot rod being positioned between the opposed ends of said spring sections and underlying the space between said opposed spring sections, said head and foot sections being defined by relatively rigid marginal members underlying side portions of said mattress with flexible supporting straps spanning said members at areas adjacent said rod whereby said support assembly causes relatively little spring and mattress distortion at the portion of said mattress adapted to support the lower back, hip and thigh portions of a body supported on said mattress in spaced relation wherein a coplanar disposition.

2. A foldable mattress support including an elongated, essentially flat base being formed and adapted to fit between a foldable mattress and a supporting spring section, a support frame including essentially planar head and foot sections mounted on a common pivot on said base for movement between a position essentially flush against said base and coplanar with one another and other positions inclined with respect to said base, said base and sections being essentially flat when said sections are flush against said base so that said base and sections may be positioned between a mattress and a supporting box spring, said head and foot sections being defined by relatively rigid marginal members and relatively flexible strap means spanning said marginal members at support areas adjacent said pivot, and corresponding to the lower back, hip and upper thigh regions of a person on said support, the outer portions of said rigid marginal members of said head and foot sections being spanned by relatively rigid straps.

3. The structure of claim **2** wherein said relatively flexible strap means are defined by straps and coil springs connected end to end and to the marginal members.

4. The structure of claim **2** wherein said base is defined by detachable sections, each section being comprised of spaced and parallel, essentially flat plate members, the spaced members of one section being alignable with and removably attached to the spaced members of the other section, said head and foot frame sections being pivotally mounted on one of said base sections.

5. The structure of claim **2** characterized by and including support leg assemblies pivoted to each of the head and foot sections, said support leg assemblies being positioned within the confines of the marginal portions of said head and foot sections and being movable between positions essentially coplanar with said head and foot sections and positions inclined with respect thereto, and means for holding said support leg assemblies in said inclined positions.

6. The structure of claim **2** wherein said base includes adjustable, downwardly extending flange elements formed and adapted to fit over at least one end of a spring support for said mattress support and mattress.

7. The structure of claim **2** wherein said foot frame section includes pivotally connected end and intermediate subsections, and a support leg assembly is pivotally mounted on at least one of said foot subsections and movable from a position essentially coplanar with said subsections to positions inclined with respect thereto, said support leg assembly being adapted to abut against said base when in said inclined position, said base including stop means for limiting angular movement of said support leg assembly in one direction.

8. A foldable mattress support including an elongated, essentially flat base being formed and adapted to fit between a foldable mattress and a supporting spring section, a support frame including essentially planar head and foot sections mounted on a common pivot on said base for movement between a position essentially flush against said base and coplanar with one another and other positions inclined with respect to said base, said base and sections being essentially flat when said sections are flush against said base so that said base and sections may be positioned between a mattress and a supporting box spring, said head and foot sections being defined by relatively rigid marginal members, support straps spanning said marginal members, said base being defined by spaced and essentially flat plates extending generally parallel to one another and spaced laterally from opposite side portions of said rigid marginal members, said flat plates each including detachable sections, said head and foot sections being pivotally mounted on one of said plate sections.

9. The structure of claim **8** wherein said base includes adjustable, downwardly extending flange elements formed and adapted to fit over at least one end of a spring support for said mattress support and mattress.

10. The structure of claim **8** wherein said foot section includes spaced supporting leg assemblies and is defined by pivotally connected foot and intermediate subsections, one of said support leg assemblies being pivotally mounted on the pivot axis between said subsections and the other supporting leg assembly being pivotally mounted on the foot subsection, said supporting leg assemblies being movable between positions within the confines of said marginal members and essentially coplanar therewith to positions inclined with respect to said subsection to thereby support said subsections at varying angular dispositions relative to one another and relative to said base, and means for holding said supporting leg assemblies in said angularly related positions.

11. The structure of claim **8** wherein said head and foot sections are mounted on a pivot rod spanning the plates of one of said sections.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,636,573 Dated January 25, 1972

Inventor(s) Fred H. Bartz

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 5, line 42, between "end" and "with" insert -- in spaced relation wherein a coplanar disposition --; Column 5, lines 58 and 59, delete -- in spaced relation wherein a coplanar disposition -- before the period.

Signed and sealed this 22nd day of August 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents