Oct. 20, 1925. 1,557,662

J. W. CRAWFORD

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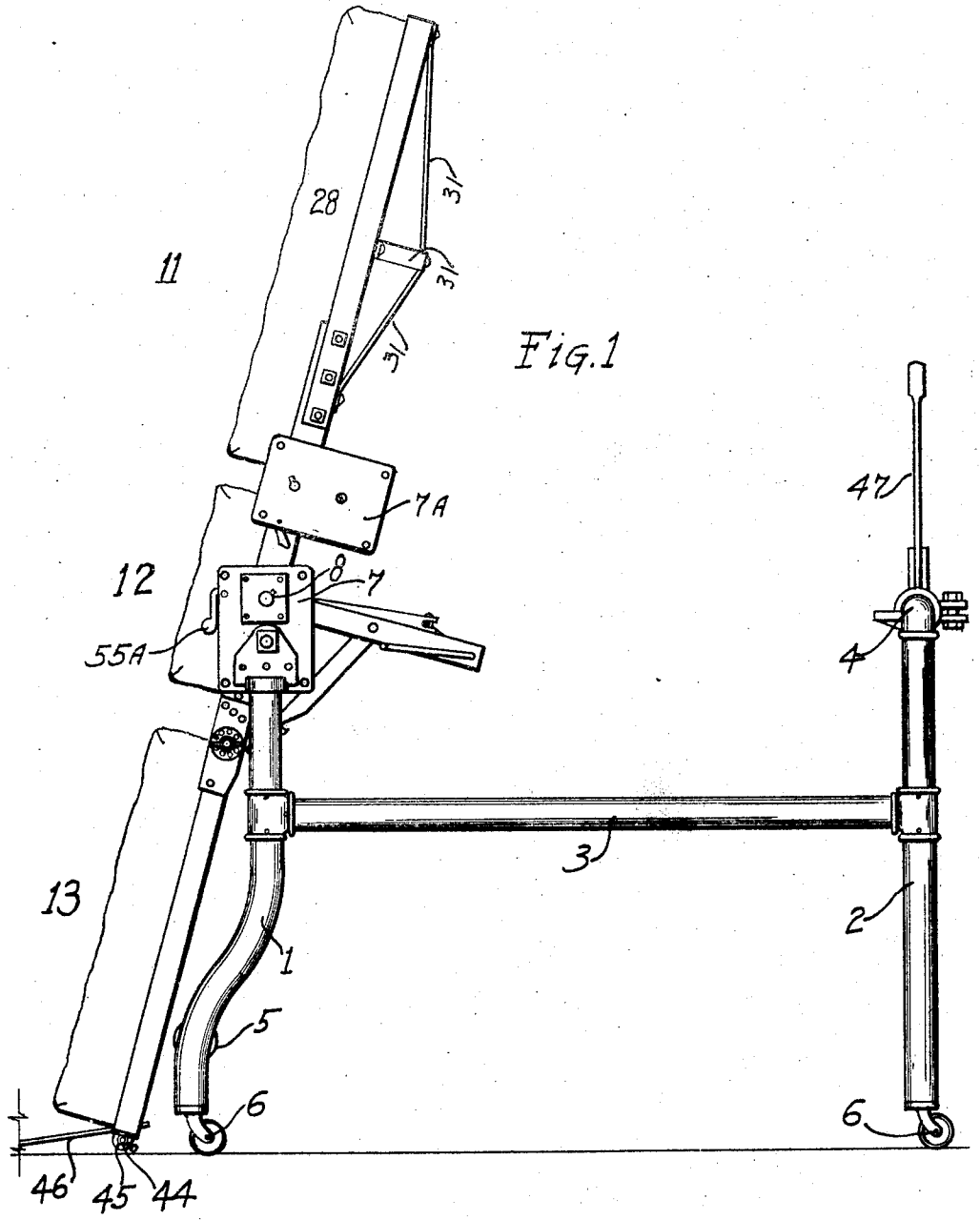


Fig. 1

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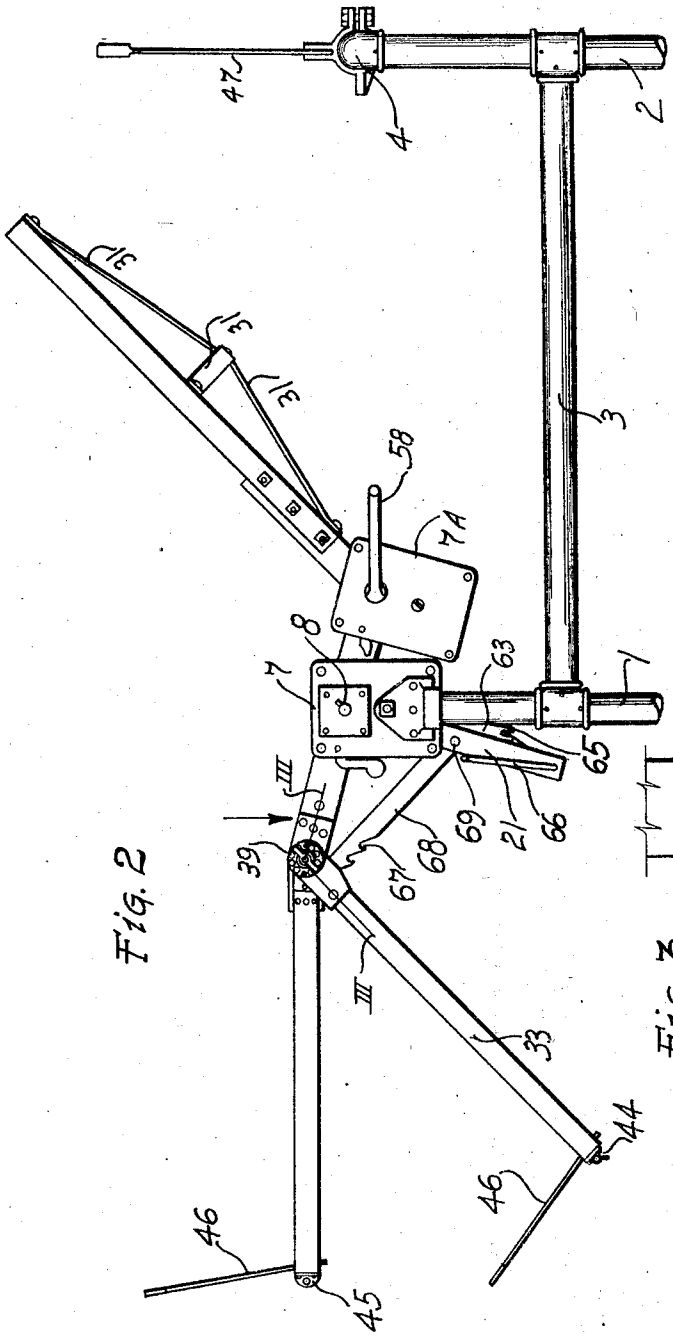


Fig. 2

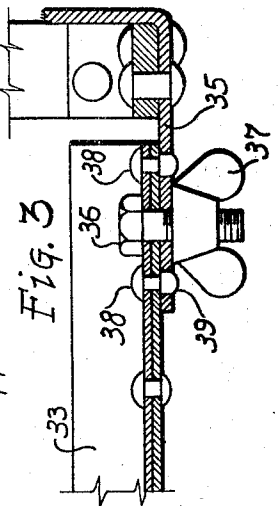


Fig. 3

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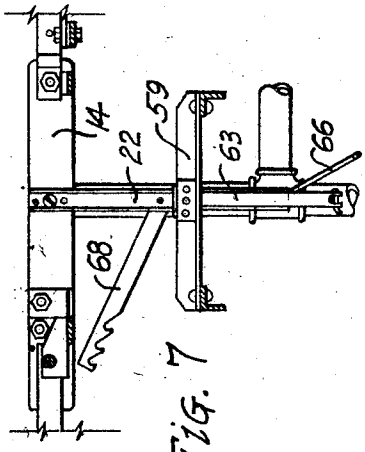


Fig. 7

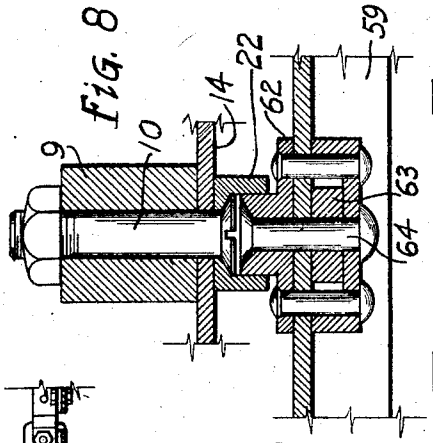


Fig. 8

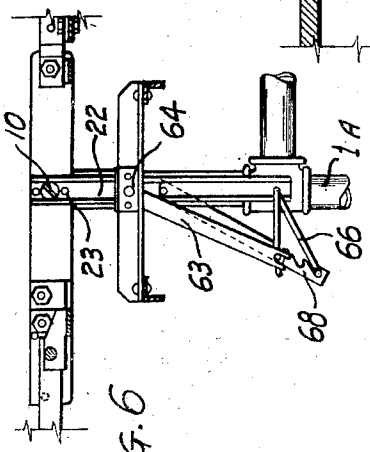


Fig. 6

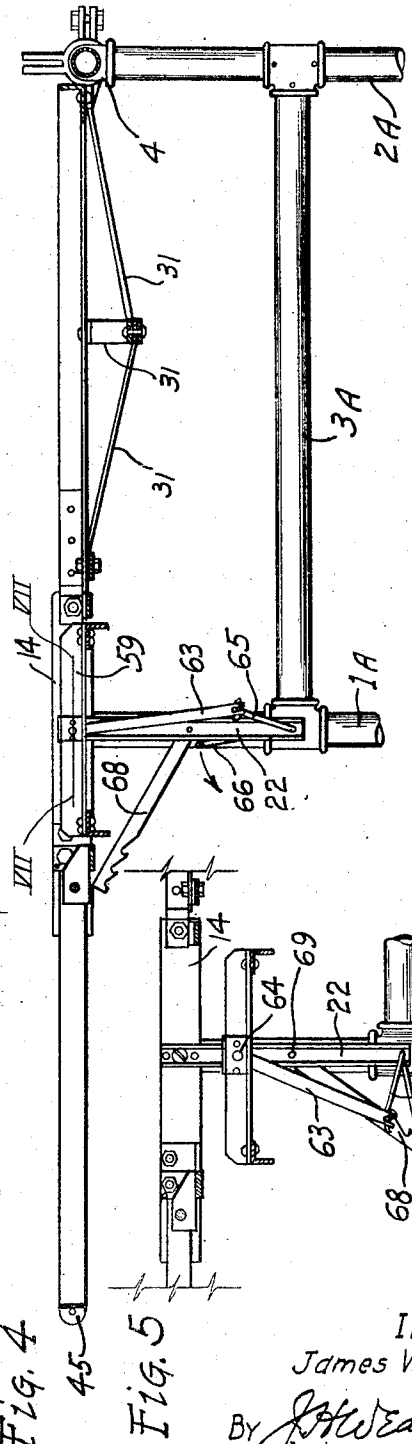


Fig. 4

Fig. 5

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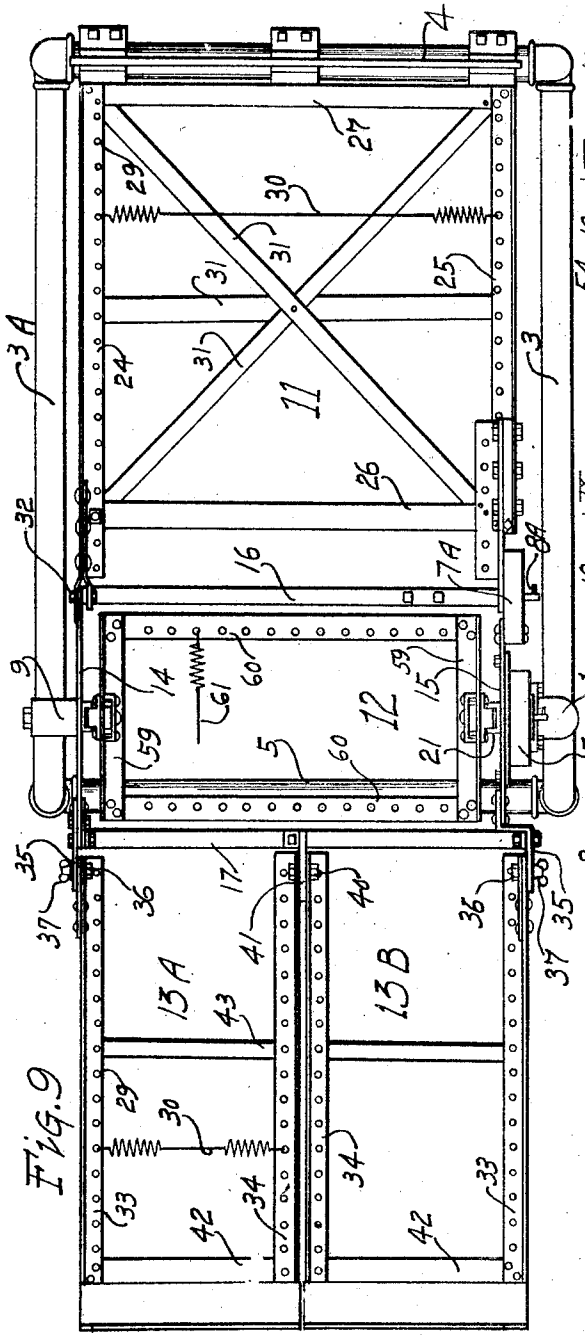


Fig. 9

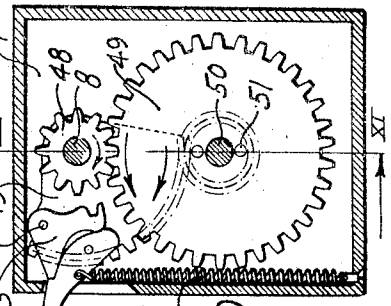


Fig. 10

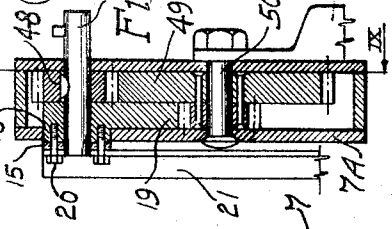


Fig. 12

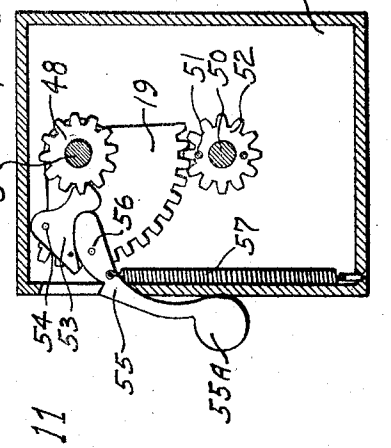


Fig. 11

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Patented Oct. 20, 1925. 1,557,662

UNITED STATES PATENT OFFICE.

JAMES W. CRAWFORD, OF MEMPHIS, TENNESSEE.

INVALID BED.

Application filed February 15, 1924. Serial No. 692,973.

To all whom it may concern:

Be it known that I, JAMES W. CRAWFORD, a citizen of the United States, residing at Memphis, in the county of Shelby and the State of Tennessee, have invented certain new and useful Improvements in Invalid Beds, of which the following is a full, clear, and exact description, such as will enable anyone skilled in the art to make and use the same.

My invention relates to improvements in adjustable beds, couches or the like in which the entire bed may be inclined as a single unit and in addition the head section and the foot section may be independently angularly adjusted relatively to the center section and the center section itself may be independently lowered below the general level of the bed.

The objects of my invention are;

First, to provide a bed in which the entire frame supporting the mattresses may be inclined from a normal substantially horizontal position to substantially a vertical position and may be locked at either the horizontal, the vertical or any intermediate position.

Second, to provide means for adjusting the head section angularly relatively to the center section and locking the same in any desired position.

Third, to provide means for adjusting each of two leg sections either independently or together at varying angles with the center section.

Fourth, to provide means for lowering the center section to any desired position below the general plane of the bed and supporting the said section in such lowered position.

Fifth, to provide specific operating mechanism for making the adjustment of the inclination of the bed as a unit and for making the angularly adjustment of the head section with reference to the center section, and

Sixth, to provide means for generally improving the construction of such a bed.

I accomplish these objects as will be more fully hereinafter set out in the drawings, specification and claims.

In the drawings;

Fig. 1 is a side elevation of my improved bed showing the bed as a unit tilted to a substantially vertical position.

Fig. 2 is a side elevation of the bed frame with the mattresses removed showing the head section, center section and two independent foot sections adjusted at varying angles to each other and to the supporting bed frame.

Fig. 3 is an enlarged detail of the means for locking the leg sections.

Fig. 4 is a sectional elevation taken on the longitudinal center line showing the bed frame in a normal horizontal position and showing the head and foot boards removed.

Fig. 5 is an enlarged sectional elevation on the same center line showing the mattress support for the center section lowered.

Fig. 6 is a similar section on an enlarged scale showing the same details with the mattress section slightly lower, and

Fig. 7 is a similar section showing the central mattress support fully lowered.

Fig. 8 is a sectional plan on the line VII—VII of Fig. 4 showing a detail of construction through the center pin.

Fig. 9 is a plan view of the bed with the mattresses removed and with the central supporting springs for the mattresses omitted for the purpose of reducing details and more clearly showing the essential parts of the structure.

Fig. 10 is a sectional side elevation on the line IX—IX of Fig. 12 looking in the direction of the arrow showing the locking devices disengaged to permit movement of the adjusting parts.

Fig. 11 is a similar section with the main gear removed showing the locking means engaged, and

Fig. 12 is a section on the line XI—XI of Fig. 10 looking in the direction of the arrow and showing the same parts.

Referring now to the drawings in which the various parts are indicated by the same numerals in all the views. The bed frame consists of main supporting posts 1—1^A, head posts 2—2^A, and side connecting members 3 rigidly attaching the posts 1 and 2 and 1^A and 2^A together. The two sides of this frame are connected by cross members 4 for the head posts 2—2^A and 5 for the main posts 1—1^A. These members constituting a rigid frame or support for the bed frame. 6 are rollers for this rigid frame.

On the upper end of the post 1 and rigidly attached thereto, is a casing 7 containing operating mechanism for adjusting the bed frame to various angles of inclination, 8 being the main shaft or center about which one

side of these frames pivot. 9 is a block which is fastened to the upper end of the post 1^A through which block in turn, passes a center or pivot 10 for the opposite side of the bed frame.

The bed frame consists essentially of three parts, a head section 11, a center or body section 12 and a foot section which latter section is divided longitudinally into two independent leg sections 13^A, 13^B. The body section 12 is a built up section comprising side members 14 and 15 and cross members 16 and 17 which members are rigidly bolted or riveted together to form an integral rectangular frame.

The side member 14 of this frame is pivoted on the pin 10 and the side member 15 is securely fastened to a hub 18 integral with a gear sector 19 which gear sector is within the casing 7 and which hub projects therefrom through one wall of the casing, the gear sector being adapted to turn within the casing about this hub as a center.

20 are cap screws which secure the frame member 15 to the hub 18. These cap screws also secure a channel shaped guide 21 to the frame member 15 and the hub 18. A similar channel shape guide 22 being secured to the frame member 14 by means of the pivot 10 and the rivets 23. These two channel shaped guides project downward from the said frame members 14 and 15 and form guides, the purpose of which will be hereafter explained. The head section 11 is made up of oppositely disposed side members 24 and 25 and cross members 26 and 27. The support for the mattress 28 being attached to the side members 24, 25 in any desired manner. For purposes of illustration holes 29 are shown in the side members 24, 25, into which holes cross members 30 may be engaged for this purpose, only one of these members being shown. 31 are cross and diagonal stiffening braces.

The side member 24 is hinged to the frame 14 of the body section 12 by means of the bolt 32, and the side frame 25 is fastened to the hub of a gear sector in the casing 7^A in identical manner as is the side frame 15 secured to the gear sector 19 in the casing 7. The casing 7 and the casing 7^A containing identical mechanism, it is deemed necessary to illustrate them only once.

The leg section is composed of two identical sections 13^A, 13^B each of which sections is made up of a side member 33 and a side member 34. These side members being pivoted to members 35 extending from the side members 14 and 15, by means of bolts 36 provided with wing nuts 37 for clamping the leg members in various positions.

In Fig. 3 a portion of the side member 33 of the leg section 13^B is shown on an enlarged scale with the bolt 36 and wing nut 37 in clamped position. The side member 33 is provided with pins 38 which project into holes 39 in the member 35, the side member 33 of the leg section 13^A being provided with similar pins and corresponding holes therefor. To adjust the member 33 relatively to the member 35 the wing nut 37 is loosened and the member 33 sprung inward to disengage the pins 38 from the holes 39. The member 33 is then adjusted to approximately the desired angle and released after which it is further slightly adjusted until the pins 38 again spring into holes, after which the nut 37 is tightened to secure the leg section in its adjusted position.

The side members 34 of these leg sections are pivoted on a bolt 40 which passes through the member 41 firmly secured to the cross member 17 of the body section. Cross members 42 riveted to the ends of the members 33 and 34 complete the frame of these leg sections. These sections may be braced with a cross brace 43 and are provided with means for supporting the mattress similar to those of the head section 11. Holes 29 and one of the cross members 30 being shown for that purpose.

Should it be desired to move the two leg sections together, a bolt 44 may be passed through holes in the lugs 45. The leg sections are each provided with a foot board 46 which may be removed therefrom and the head section is provided with a head board 47 which likewise may be removed in order that access may be had to the bed from any position. In Figs. 1 and 2 these head and foot boards are shown in position, whereas in Fig. 4 they have been removed.

To provide means for adjusting the inclination of the bed as a whole, mechanism enclosed in the casing 7 is provided. To provide for adjustment of the head section relatively to the body section identical mechanism enclosed in the casing 7^A is provided. The means for adjusting the leg section has been previously described. The mechanism for adjusting the body section or the head section as the case may be, comprises a gear sector 19 within the casing 7 (or 7^A) having a hub 18 projecting through one side thereof to which hub the member 15 is secured by the cap screws 20, the head section being similarly secured to its corresponding sector and hub. Journaled in the hub 18 and the sector 19 and concentric with the hub 18 is a shaft 8 on which is keyed or otherwise secured, a pinion 48, the end of this shaft passing outside the casing 7. Meshing with the pinion 48 is a gear 49 which is journaled on a pin 50. Integral with this gear 49, or secured thereto by means of bolts or rivets 51, and in axial alignment with it, is a second pinion 52 which meshes with the gear sector 19. 53 is a pawl which is pivoted on a pin 54 projecting from the

gear sector 19, this pawl being adapted to engage and lock the teeth of the pinion 48 or to be withdrawn therefrom to allow the rotation of the pinion. 55 is a locking member pivoted on a pin 56 projecting from the gear sector 19 which locks the pawl 53 in engagement with the pinion 48, when the handle 55A is depressed, and unlocks the pawl and disengages the same when the handle is raised. 57 is a coil spring for holding this locking member in locking engagement with the pawl 53.

To adjust the inclination of the bed as a whole, the handle 58 shown in Fig. 2 as in place on casing 7A is engaged with the shaft 8 of the casing 7 and the handle 55A of the locking member 55 raised manually to unlock and disengage the pawl 53 from the pinion 48. The handle 58 is then rotated in the desired direction being turned to the left if it be desired to bring the bed into a vertical position and being turned to the right, if it be desired to throw the body section thereof into the position shown in Fig. 2. In either case the handle 58 having been engaged with the shaft 8, when turned rotates the pinion 48 which is keyed to the shaft 8 and this pinion in turn rotates the gear 49 thereby rotating the pinion 52 which is secured to the said gear. The pinion 52 in turn, turns the gear segment 19, with which it meshes and this segment being secured to the member 15 and the member 21 secured thereto, thus varies the angle of inclination of the center section with reference to the casing 7 and thereby with reference to the post 1, to which the casing is secured. If it be desired to adjust the head section relatively to the body section, the handle 58 is engaged with the corresponding shaft of the casing 7A and rotated to the left to move the head section into the position shown in Fig. 2, the gear action in this case being identical with that hereinabove described. It will of course be readily seen that if it be desired to bring the body section into the position shown in Fig. 2, it will be necessary to first incline the head section as there shown in order to permit such motion, whereas the entire bed may be brought into the position shown in Fig. 1 without moving either of the other sections.

The leg sections may be adjusted either together or individually, as has been heretofore described.

Referring now more especially to Figs. 4, 5, 6 and 7, it will be seen that the body section is provided with an independent central portion or mattress support which is made up of two side members 59 and two cross members 60 riveted together to form a rectangular frame and provided with mattress supporting members 61 preferably similar to the members 30. To each of these sides 59 is riveted a block 62 which is adapted to slide in the guides 21 or 22 as the case may be. Also depending from each of the side members 59 and blocks 62 is a strut 63 which is pivoted on the pin 64. Lying between the guides 21 and 22 is a U shaped rod 65 which engages forks in the lower end of the strut 63. The opposite ends of the legs of this U shaped rod being bent outward and passing through holes in the lower end of the guides 21 and 22. After passing through these holes, arms 66 integral with the legs of this U shaped member extend outward and are laterally bent and adapted to engage notches 67 in the swinging arms 68 pivoted to the guides 21 and 22 on rivets 69.

When in the fully raised position shown in Fig. 4 bent ends of the arms 66 come against the side of the guides 21 and 22 after the legs 65 swing past the dead center as shown, thus securely supporting the center portion in a raised position. To lower the center portion the arms 66 are swung out in the direction of the arrow in Fig. 4 and the swinging arms 68 are brought downward until the ends of the arms 66 engage one set of the notches 67 in the said swinging arms, as shown in Fig. 5. Should it be desired to further lower the center section, the arms 66 may be engaged with the lower notches on the swinging arms 68 as shown in Fig. 6. Or the arms 66 may be entirely disengaged from the swinging arms 68 and the center section be dropped to the extreme lower position shown in Fig. 7.

It will be noted from these drawings, that I have provided three sets of the notches 67 in the swinging arms 68 so that I have in addition, to the extreme lower position of the center section three intermediate positions and the normally raised position shown in Fig. 4. While I have recited two notched arms 68, I ordinarily use one only.

It will be seen that I have provided in this structure means for adjusting the inclination of the bed as a whole, from a horizontal to a vertical position, means for adjusting the leg sections together or independently, means for adjusting the head section relatively to the other section, and have also provided means for lowering the central or body portion, and for the adjustment of the position of the latter to various heights.

In these drawings, I have shown the frame members as riveted together and as made of angle iron sections, but these may of course be changed if desired and these sections may be bent in part to form the various shapes of sections shown. I have shown the posts and other members of pipe, but it will be readily understood that these members may be made solid or of any de-

sired structural shape which may be more convenient.

While I have shown my invention in the form which I prefer to make it, it will be realized that many of the other details of construction may be varied without departing in any way from the spirit of my invention.

Having now fully described my invention, what I claim and desire to secure by Letters Patent of the United States is:—

1. In an invalid bed, the combination with a supporting frame, of a mattress support pivoted to said frame, and means for varying the inclination of said support, comprising a casing, a gear sector within said casing, a hub projecting therefrom through said casing and attached to said central section, said hub being rotatably mounted in said casing, a shaft rotatably mounted in said gear sector and projecting beyond said casing, a handle for turning said shaft, a pinion attached to said shaft, a gear meshing with said pinion, a pinion in axial alignment with and attached to said gear, meshing with said sector, a pawl engaging the teeth of said first pinion, a pawl locking member, a handle thereon for depressing said locking member to hold said pawl in engagement with said pinion, and for raising said member to disengage said pawl, and a spring for normally depressing said handle.

2. In an invalid bed, the combination with a supporting frame, of a mattress support pivoted to said frame, and means for varying the inclination of said support, comprising a casing, a gear sector within said casing, a hub projecting therefrom through said casing and attached to said support, said hub being rotatably mounted in said casing, a shaft rotatably mounted in said gear sector and projecting beyond said casing, a handle for turning said shaft, a pinion attached to said shaft, a gear meshing with said pinion, a pinion in axial alignment with and attached to said gear, meshing with said sector, a pawl engaging the teeth of said first pinion, means for locking said pawl and means for disengaging said pawl.

3. In an invalid bed, the combination with a supporting frame, of a mattress support pivoted to said frame, and means for varying the inclination of said central section, comprising a casing, a gear sector within said casing, a hub projecting therefrom through said casing and attached to said support, said hub being rotatably mounted in said casing, means for turning said gear sector, a pawl for locking said turning means, a pawl locking member, a handle thereon for depressing said locking member to hold said pawl in engagement with said pinion, and for raising said member to disengage said pawl, and a spring for normally depressing said handle.

4. In an invalid bed, a supporting frame, a section mounted on said frame, a mattress support vertically movable within said section, guiding means therefor, hinged struts depending below said guiding means having opposite ends pivoted in the lower ends of said guiding means, and in the lower ends of said struts respectively, members integral with said first members and adapted to engage against said guiding means to normally hold said struts and said mattress support in raised position, and bars having notches therein adapted to be engaged by said integral members when said struts are lowered, to limit the movement of said members and said struts and support said mattress support in lowered position.

5. In an invalid bed, a supporting frame, a central section mounted on said supporting frame, guides attached to said central section and depending therebelow at right angles thereto, a mattress support within said central section, blocks rigidly attached to said mattress support and slidably mounted in said guides, hinged struts depending below said blocks, members having opposite ends pivoted in the lower ends of said guides and in the lower ends of said struts respectively, members integral with said first members, and adapted to engage against said guides to normally hold said struts and said mattress section in raised position, and bars having notches therein adapted to be engaged by said integral members when said struts are lowered to limit the movement of said members and said struts and support said mattress section in lowered position.

6. In an invalid bed, a supporting frame, a central section mounted on said supporting frame, guides attached to said central section and depending therebelow at right angles thereto, a mattress support within said central section, blocks rigidly attached to said mattress support and slidably mounted in said guides, hinged struts depending below said blocks, members having opposite ends pivoted in the lower ends of said guides and in the lower ends of said struts respectively, and adapted to normally hold said struts and said mattress section in raised position, means for limiting the movement of said members and said struts in several positions when said mattress section is lowered.

In testimony whereof I have hereunto set my name.

JAMES W. CRAWFORD.