H. J. MÜLLER.

COUCH HAVING A DIVIDED RESTING SURFACE.

APPLICATION FILED JUNE 3, 1916.

1,255,208.

Patented Feb. 5, 1918.

3 SHEETS—SHEET 1.

Fig. 1

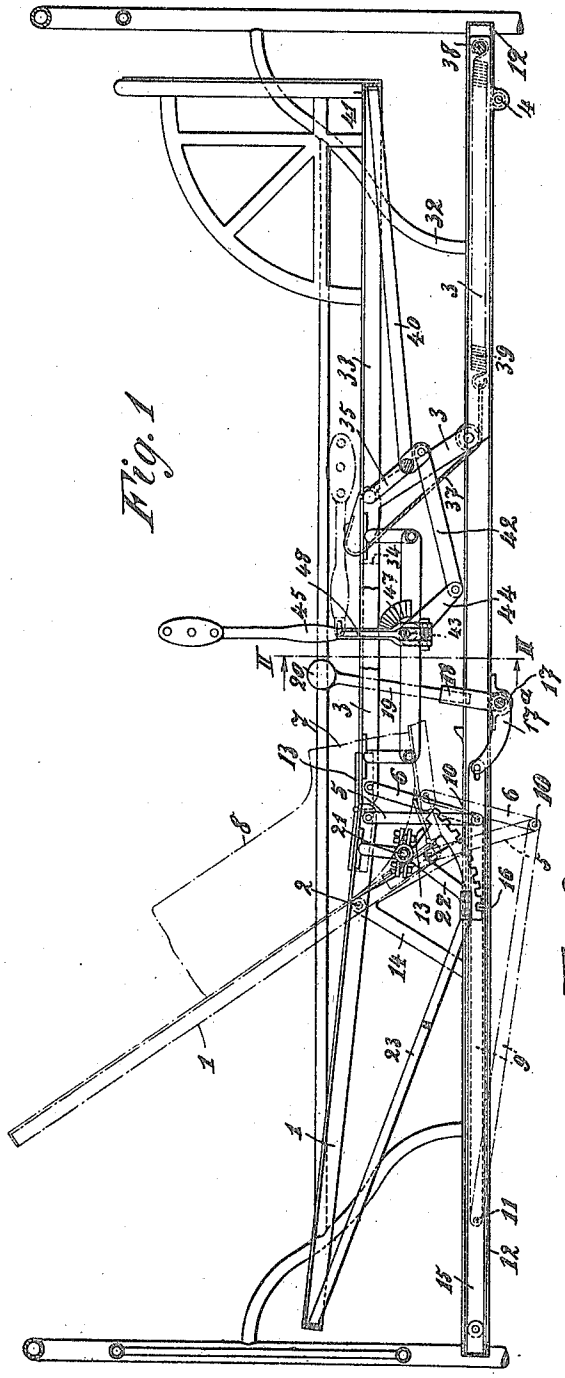


Fig. 3

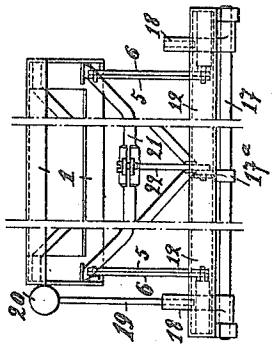
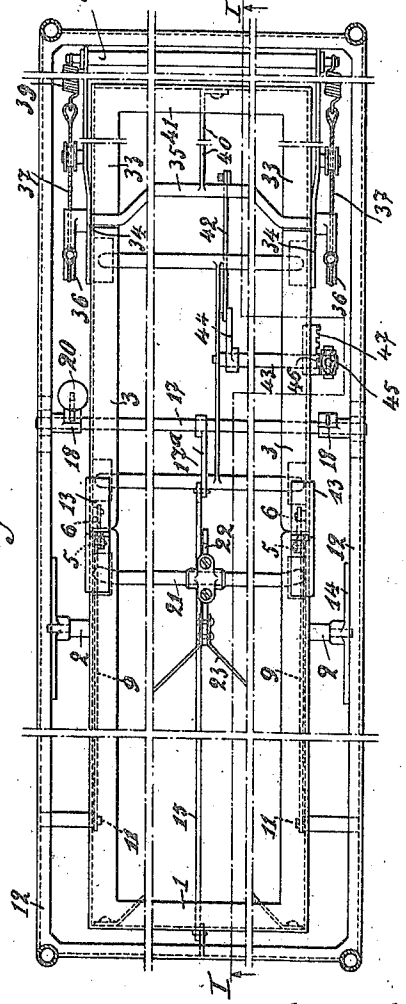


Fig. 2



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3 SHEETS—SHEET 2.

Fig. 4

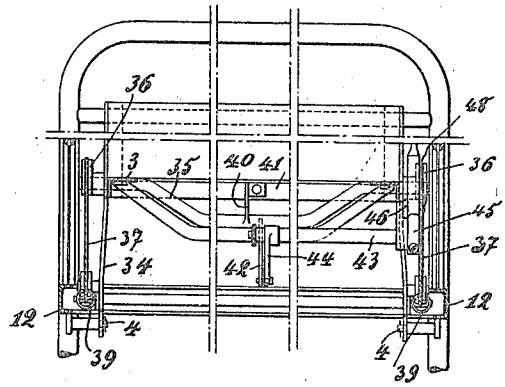


Fig. 5

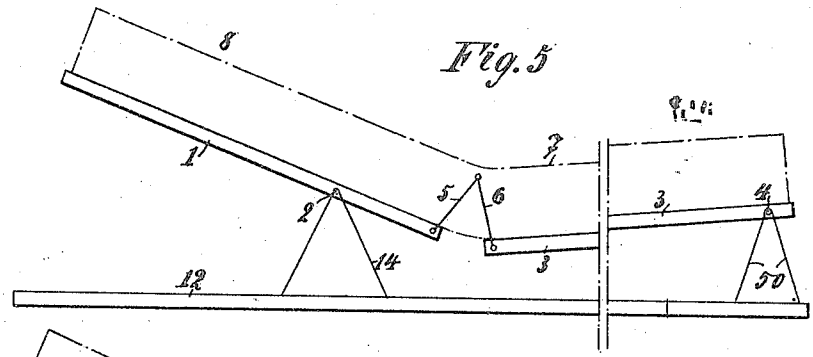
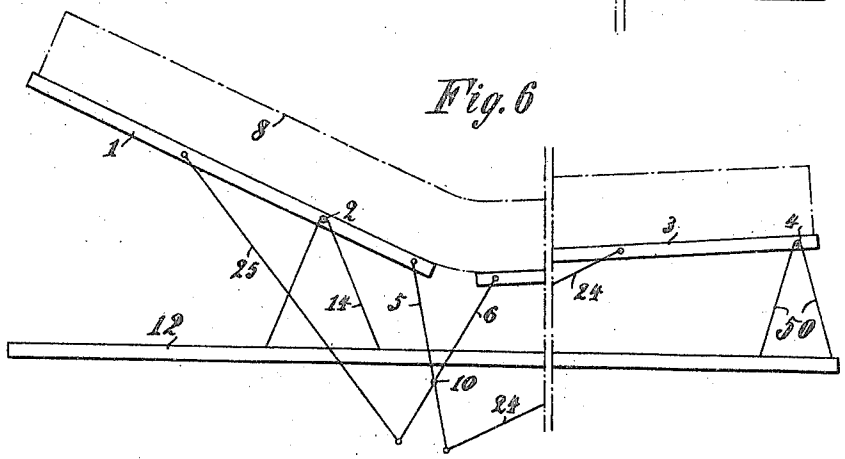


Fig. 6



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3 SHEETS—SHEET 3.

Fig. 7

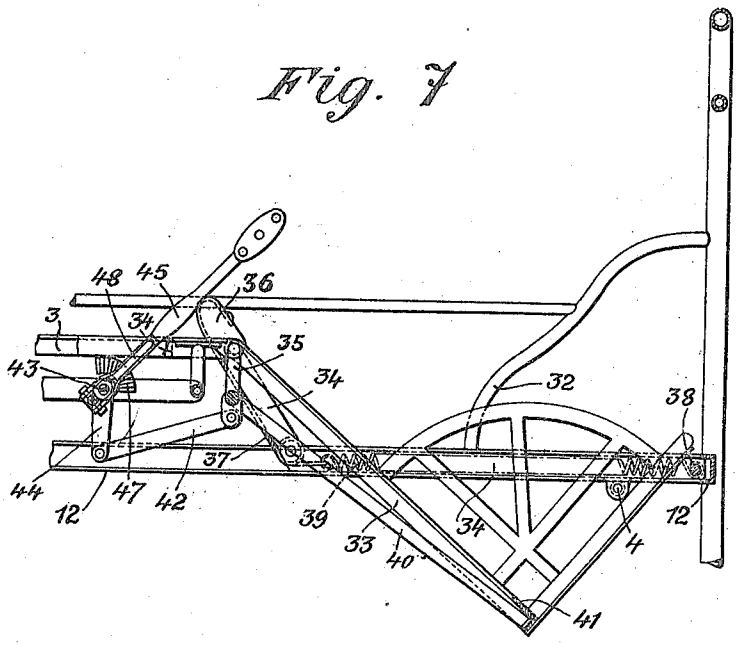


Fig. 8.

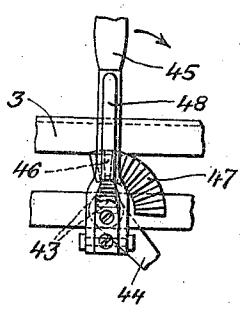
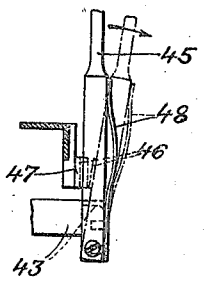


Fig. 9.



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UNITED STATES PATENT OFFICE.

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COUCH HAVING A DIVIDED RESTING-SURFACE.

1,255,208. Specification of Letters Patent. Patented Feb. 5, 1918.

Application filed June 3, 1916. Serial No. 101,489.

To all whom it may concern:

Be it known that I, HEINRICH JULIUS MÜLLER, a citizen of the Republic of Switzerland, residing at Schaffhausen, in the Canton of Schaffhausen, Republic of Switzerland, have invented certain new and useful Improvements in Couches Having Divided Resting-Surfaces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention has for its object to provide an improved couch having a divided resting surface. In couches having a head section hinged to a lower part made in one or more pieces, in elevating and depressing the head section, great friction is produced between the same and the mattress located on both sections, which prevents an easy shifting of the head section.

The present invention has for its object to avoid this friction between the head section and the mattress, and thereby provide an easy movement of the head section. This object is effected by separating the pivoted head section and the pivoted body section at their abutting ends, and connecting them together outside of the said ends by means of intermediate devices in such a manner that the abutting ends of the two sections shall rock away from each other in the elevating of the head section, and shall rock toward each other in the depressing of the body section. By this arrangement the mattress is enabled to bend downwardly to such an extent as to avoid all tendency to shifting and friction between itself and the head section, whereby an easy movement of the latter is obtained.

Furthermore, according to this invention, the foot section is adapted to be elevated and depressed independently of the head without exertion by the person lying on the couch. For this purpose a portion of the resting surface is bent downward, and the foot is fixed on a crank shaft comprising two cams to which are attached flexible tensile members connected to raising springs. By this means the raising force is rendered approximately equal at the beginning and at the end of the straining of the springs. For the purpose of locking the foot section in its adjusted position, a hand lever is employed which is fixed on a shaft connected to the crank shaft, but which however can rotate in the axial direction of its own shaft. This lever has a locking tooth which is adapted to be engaged by a spring into a stationary toothed locking sector.

The improved couch allows even a person who is suffering from pains in the body to bring himself into any desired sitting position, and to bring his feet into any desired position of inclination, without straining his abdominal muscles and without other help, within the range of the lying and sitting positions.

Some embodiments of this invention are illustrated in the accompanying drawings in which Figures 1, 2, 3 and 4 illustrate one embodiment,

Fig. 1 being a longitudinal central section on the line I—I of Fig. 2,

Fig. 2 being a plan,

Fig. 3 being a front end elevation, and

Fig. 4 being a cross section on the line II—II of Fig. 1.

Fig. 5 is a diagrammatic elevation of a second embodiment, and

Fig. 6 is a diagrammatic elevation of a third embodiment.

Fig. 7 is a longitudinal central section on the line I—I of Fig. 2, showing the foot section and connection in another position than that shown in Fig. 1. Figs. 8 and 9 show the lever 45 and connection on a larger scale.

Referring to the example shown in Figs. 1 to 4; 1 is an upper frame pivoting on pins 2 and forming the head section, and 3 is a lower frame forming the body section of the couch pivoting on pins 4 (see Figs. 1 and 4) carried by the frame 12. The abutting ends of the head and body sections 1 and 3 are separate from each other and are connected to each other outside the abutting edges, on each side by means of dependent scissorslike bars 5 and 6 jointed together at their lower ends. This separation of the abutting edges of the head and body sections 1 and 3 and the scissorslike connection of these parts allow, in the elevating of the head section 1 (see dot and dash lines in Fig. 1), of the abutting edges of the head and body sections rocking away from each other, and thus allow a free and complete bending or folding of the mattress 7 resting on the said sections. Consequently, in the

elevating of the head section 1, the top 8 of the mattress has no tendency to slide upward on the head section 1, so that all friction between the latter and the mattress is avoided, and the head section can be easily elevated. For the guidance of the scissors bars 5 and 6 there is arranged on each side of the couch a connecting rod 9 one end of which is pivoted on the pivot pin 10 of the two scissors bars, and the other end of which is pivoted on a stationary pin 11 of the rigid supporting frame 12.

In order to prevent any possible nipping of the mattress 7 in the depressing movement of the head section 1, there is arranged on each side piece of the head section 1 a hinged flap 13 which is angular in cross section, and which bears loosely on the oppositely located side piece of the body section 3, and which bridges over the gap between the head and body sections when the former has been elevated.

The pivot pins 2 of the upper part 1 are mounted in brackets 14 supported on the side pieces of the supporting frame 12.

For the purpose of increasing the easy mobility of the head section 1, the pivot pins 2 are located in the side pieces of the head section and at such points as to allow the person lying on the mattress to adjust his position in equilibrium with relation to the pivot pins 2, so that tilting movements of the head section are avoided.

For the purpose of fixing the head and body sections 1 and 3 in their adjusted positions, there is jointed to the supporting frame 12 one end of a bar 15 having a locking tooth 16, the other end of said bar being pivoted with a certain amount of play to a lever 17a that is fixed on a cross shaft 17 mounted in the supporting frame 12. On each end of the shaft 17 there is mounted a short hollow arm 18 in which a longer arm 19 having a handle 20, is adapted to be inserted. According to requirement the arm 19 can be inserted into the right or left hollow arm 18, and the shaft 17 be rotated with the left or right hand. On the cross piece 21 of the head section 1 there is clamped a toothed arc 22 in the tooth spaces of which the locking tooth 16 can be engaged. The toothed arc 22 is fixed rigidly by means of two struts 23 to the cross piece of the head section 1.

A person using the couch lies on the two sections 1 and 3 in such a manner that he is in a position of equilibrium relatively to the pivot pins 2 of the head section. If he now wishes to move from the recumbent position into a sitting position, then he pulls the handle 20 and by thus rotating the parts 19, 18, 17 and 15, he moves the locking tooth 16 out of the toothed arc 22, and then raises his head slightly. This slight shifting of the center of gravity which is unaccompanied by any exertion, is sufficient to bring the head section 1 into the desired sitting position. When it has arrived in this position, the handle is turned toward the foot of the couch, and by reëngaging the locking tooth 16 into the toothed arc 22, the head section is locked in its adjusted position. In the elevating of the head 1, the mutually facing ends of the side pieces of the upper and lower parts rock away from each other, and the hinged flaps 13 lie over the gaps formed between the said sections. By the moving away of the abutting ends of the head and body sections room is made for a free and complete bending of the mattress 7 so that the upper part of the mattress has no tendency to slide up along the head section and produce friction at that place. By this free bending of the mattress and the adjustment of the person into a position of equilibrium relatively to the pivotal axis of the head section 1 (which serves as it were as a weighing beam), such an easy change of position of the head section can be effected without the aid of another person, that it does not require any exertion of the trunk muscles, which is very important, more particularly in the case of persons suffering from ailments of the trunk and requiring special care. In the elevating of the head section 1 the upper part of the body section 3 moves down with the rotation on the stationary pivot pins 4 located on the supporting frame 12.

If the said person wishes to change his sitting position for a recumbent position, he pulls the handle 20 again toward himself and lays back his head, whereby the head section 1 is depressed. The rocking of the handle 20 toward the foot of the couch causes the tooth 16 to engage again in the toothed arc, and thus the head section is locked in its depressed position. As the elevating, so also the depressing of the head section is effected without any exertion and without tilting motion. In the depressing of the head section 1, the mutually facing ends of the head and body sections rock again toward each other and close up the gaps covered by the flaps 13.

The foot section 33 of the divided resting surface is adapted to be raised and lowered independently of the body and the head sections. The body section 3 of the resting surface is stepped downward in order to provide room for the movement of the foot section 33. The frame-like foot section 33 is fixed to the journals of a crank shaft 35 which is rotatably mounted in the cranked side bars 34 of the body portion 3 of the resting surface. On each journal there is mounted a peripherally grooved eccentric 36 to which is attached one end of a wire cord 37, the other end of which is connected to a spring 39 suspended from the cross bar 38

of the side bars 34. The springs 39 are designed to raise the foot section 33, and the raising power is rendered approximately equal for all degrees of tension of the springs by the action of the eccentrics.

The cranked portion of the shaft 35 is fixed rigidly by means of a supporting rod 40 to the cross piece 41 of the foot section 33, and is connected by means of a connecting rod 42 to a lever 44 fixed on the shaft 43. The outer end of this shaft has mounted on it a locking hand lever 45 having a locking tooth 46 adapted to engage a stationary toothed arc 47. Said lever 45, in addition to its rotational movement with the shaft 43 is adapted to rock outwardly as indicated in Fig. 9. The upper part of the locking lever may also be adapted to fold over as shown in dot and dash lines in Fig. 1.

For the purpose of bringing the foot 33 from the horizontal position, see Fig. 1, to the inclined position shown in Fig. 7, the locking lever 45 which is usually kept folded down, is raised, and then disengaged from the toothed arc 47 (in opposition to the action of a spring 48) and rotated toward the foot of the couch until the foot section of the couch has assumed the desired angular position. Then the lever 45 is released whereupon it is caused by the spring 48 to reëngage with the toothed arc 47, thereby locking the foot section in position. During the downward movement of the cranked portion of the shaft 35 the eccentrics 36 are turned upward, see Fig. 7 and the springs 39 are placed under stress. The increased spring tension acts therefore upon the small leverage of the eccentrics 36. For the purpose of raising the foot section into the initial position, the locking lever 45 is again disengaged, so that the springs 39 which were placed under stress by the depressing of the foot, are able to raise the foot with approximately the same force, because these springs when their force decreases act upon the eccentrics with an increasing leverage. Finally the locking lever 45 is again engaged in the toothed arc 47, and the upper part of the locking lever is turned down.

If the shaft 43 of the hand lever 45 be extended over the entire width of the resting surface, the hand lever 45 can then be mounted on the opposite end of the said shaft which may be desirable in order to avoid the patient striking against hard bodies when getting on to the resting surface. In such a case a toothed locking arm 47 must be provided also on the opposite side of the resting surface.

In the modification shown in Fig. 5, the scissors-like bars 5 and 6 are directed upwardly; otherwise the construction is the same.

In the modification shown in Fig. 6, the scissors-like bars 5 and 6 are extended beyond their common pivot 10, and the extension of the bar 5 is pivoted by means of a rod 24 to the lower part 3. The extension of the bar 6 is pivoted by means of a rod 25 to the upper part 1.

The handle 20 may also be moved into and held in the locking position by means of a spring.

The movable foot section 33 may be omitted. In such a case the body section 3 is not cranked and is rotatably mounted in brackets 50 carried by the supporting frame 12 (Figs. 5 and 6).

The improved couch which is favorably distinguished by its extremely simple construction, may be constructed as an insertion in wooden and metal bedsteads, and it affords to all persons both well and sick, the convenience of an extremely easy and secure adjustability. Shocks and movements such as rapid tilting which are injurious to invalids, are avoided in the improved couch.

The disengagement of the locking tooth 16 from the toothed arc may be effected also by other means, for example electric devices.

What I claim is:—

1. In an invalid bed, the combination of a supporting frame, a head section pivoted to the frame, a body section pivoted to the supporting frame and completely separated at its inner end from the abutting end of the head section, devices connecting the abutting ends of said sections and located outside of these ends and means for positively guiding the said connecting devices whereby the said ends are caused to move in unison, to keep in alinement, and are allowed to rock away from each other in the elevating movement of the head section and toward each other in the depressing movement of the head-section.

2. In an invalid bed, the combination of a supporting frame a head section pivoted to the frame, a body section pivoted to the frame and completely separated at its inner end from the abutting end of the head-section, scissors-like arms connecting the abutting ends of said sections and connected together and means for positively guiding the said scissors-like arms whereby the said ends are caused to move in unison, to keep in alinement, and are allowed to rock away from each other in the elevating movement of the head section and toward each other in the depressing movement of the head-section.

3. In an invalid bed, the combination of a supporting frame, a head section pivoted to the frame, a body-section pivoted to the frame and completely separated at its inner end from the abutting end of the head-section, downwardly directed scissors like arms connecting the abutting ends of said section and connected together and guiding

rods pivoted at one end to the frame and at the other end to the point of connection of said arms whereby the abutting ends of the head section and body-section are caused to move in unison, to keep in alinement, and are allowed to rock away from each other in the elevating movement of the head-section and toward each other in the depressing movement of the head-section.

4. In an invalid bed, the combination of a supporting frame, a head section pivoted to the frame, the pivot pins being located intermediate the side pieces of the head-section, and so that the person using the bed can assume a position of indifferent equilibrium relatively to the pivot of said head section and can thus use the said head section like the beam of a balance, a pivoted body-section, pivoted at its foot end to the foot end of the supporting frame, completely separated at its inner end from the abutting end of said head section, devices connecting the abutting ends of said sections, and means for positively guiding the said connecting means whereby the said ends are caused to move in unison, to keep in alinement, and are allowed to rock away from each other in the elevating movement of the head-section, and toward each other in the depressing movement of head-section.

5. In an invalid bed, the combination of a supporting frame, a head-section pivoted to the frame, a body section pivoted to the supporting frame and completely separated at its inner end from the abutting end of the head-section, devices connecting the abutting ends of said sections and located outside of these ends, means for positively guiding the said connecting devices, whereby the said ends are caused to move in unison, to keep in alinement, and are allowed to rock away from each other in the elevating movement of the head-section and toward each other in the depressing movement of the head section, and means operable by the person on the bed for the purpose of locking said head section in its adjusted position for use.

6. In an invalid bed, the combination of a supporting frame a head-section pivoted to the frame, a body section pivoted to the supporting frame and completely separated at its inner end from the abutting end of the head-section, devices connecting the abutting ends of said sections and located outside of these ends, means for positively guiding the said connecting devices, whereby the said ends are caused to move in unison, to keep in alinement, and are allowed to rock away from each other in the elevating movement of the head-section and toward each other in the depressing movement of the head-section, a toothed arc fixed to said head section, a rocking arm with locking pin adapted to engage the toothed arc, a shaft, a lever fixed on said shaft and pivoted to said rocking arm, and a hand lever fixed on said shaft for rotating said shaft.

7. In an invalid bed, the combination of a supporting frame, a head-section pivoted to the frame, a body-section pivoted to the supporting frame and completely separated at its inner end from the abutting end of the head-section, devices connecting the abutting ends of said sections and located outside of these ends, means for positively guiding the said connecting devices, whereby the said ends are caused to move in unison, to keep in alinement, and are allowed to rock away from each other in the elevating movement of the head-section and toward each other in the depressing movement of the head-section, and a hinged flap fixed at each side to one of the said sections and adapted to bear freely upon the other section for the purpose of bridging the gaps occurring between the said sections and preventing the mattress from being nipped between said sections.

8. In an invalid bed, the combination of a supporting frame, a head-section pivoted to the frame, a body section pivoted to the supporting frame and completely separated at its inner end from the abutting end of the head-section, devices connecting the abutting ends of said sections and located outside of these ends, means for positively guiding the said connecting devices, whereby the said ends are caused to move in unison, to keep in alinement, and are allowed to rock away from each other in the elevating movement of the head-section and toward each other in the depressing movement of the head-section, a foot-section pivotally connected to the foot portion of the body section, means operable by the person on the bed for raising and lowering said foot section, and means operable by the person on the bed for locking and unlocking said foot section.

9. In an invalid bed, the combination of a supporting frame, a head-section pivoted to the frame, a body-section having a stepped foot portion pivoted to the supporting frame, a crank shaft movably mounted in the foot-portion of the body-section, a foot-section fixed on said crank shaft, eccentrics fixed on said crank shaft, raising springs connected at one end to the frame and at the other to the eccentrics by means of flexible tensile devices, means operable by the person on the bed for operating said crank shaft, and means operable by the said person for locking and unlocking said foot-section.

10. In an invalid bed, the combination of a supporting frame, a head section pivoted to the frame, a body section having a stepped foot portion pivoted to the supporting frame, a crank shaft movably mounted

in the foot-portion of the body-section, a foot-section fixed on said crank shaft, eccentrics fixed on said crank shaft, raising springs connected at one end to the frame and at the other to the eccentrics by means of flexible tensile devices, an axle connected to said crank shaft, a hand lever mounted on said axle so as to rotate therewith but movable in the axial direction of said axle, a locking tooth on said hand lever, a stationary locking toothed arc, and a spring having a tendency to engage said hand lever in said locking toothed arc.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

HEINRICH JULIUS MÜLLER.

Witnesses:

HERMANN HUBER,

CARL GUBLER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."