W. J. GROTENHUIS.

BED OR COUCH.

APPLICATION FILED APR. 2, 1909. RENEWED SEPT. 22, 1910.

973,778.

Patented Oct. 25, 1910.

2 SHEETS—SHEET 1.

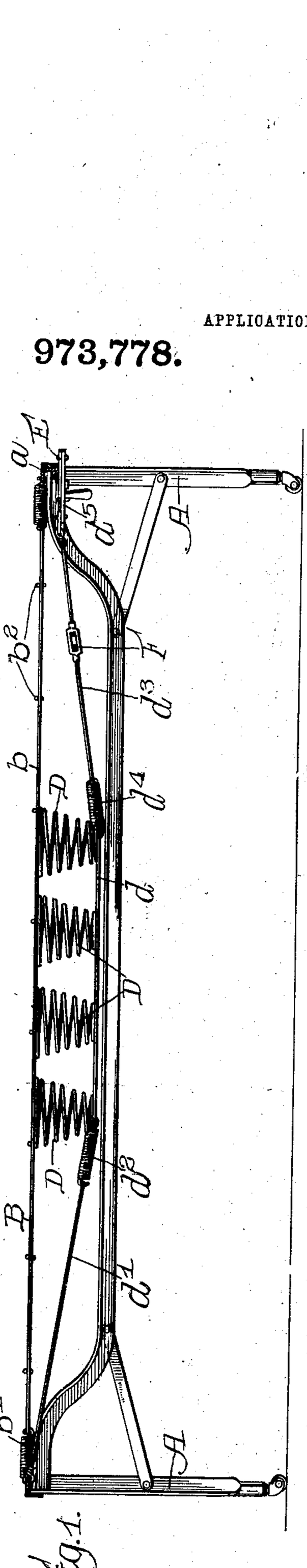

Fig. 1.

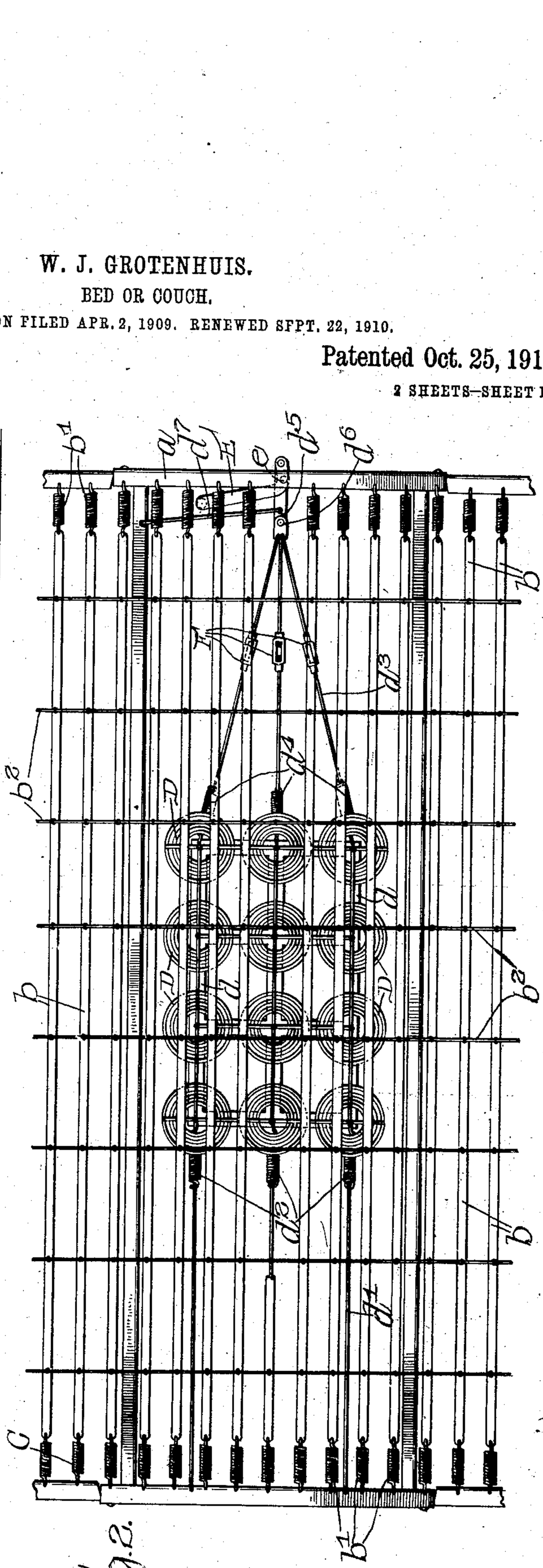

Fig. 2.

Witnesses:

Jas. D. Perry

G. W. Thomas Jr.

Inventor:

W. J. Grotenhuis

By Bulkley Bulkley & Drury

Attorneys

W. J. GROTENHUIS.

BED OR COUCH.

APPLICATION FILED APR. 2, 1909. RENEWED SEPT. 22, 1910.

973,778. Patented Oct. 25, 1910.

2 SHEETS—SHEET 2.

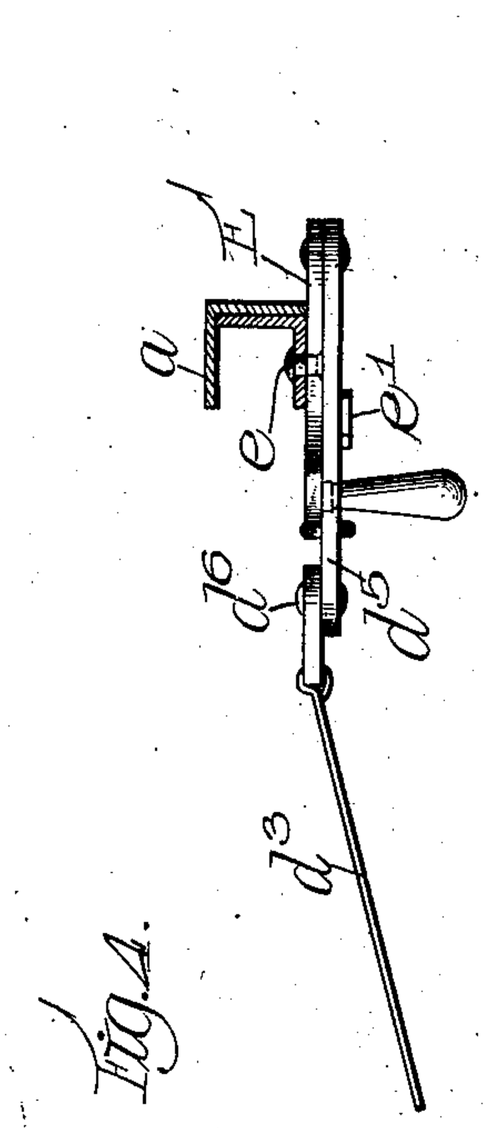

Fig. 4.

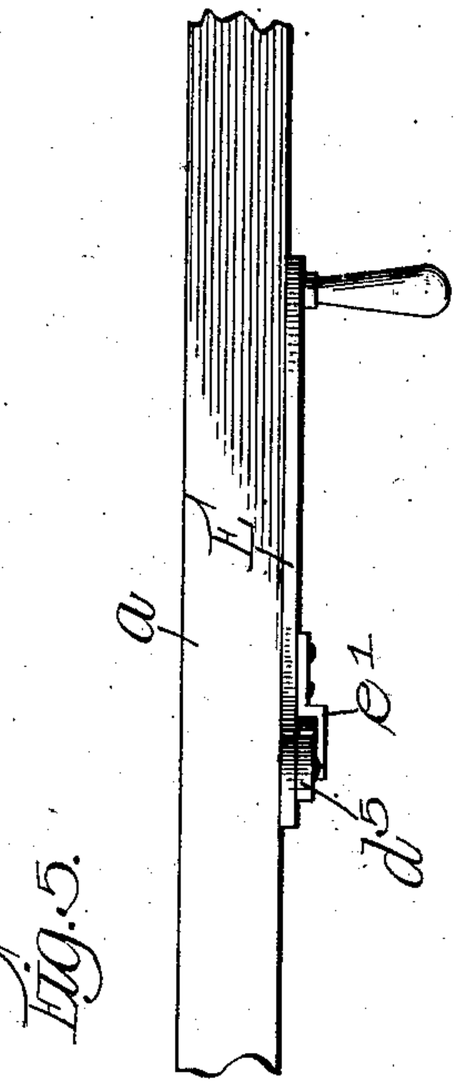

Fig. 5.

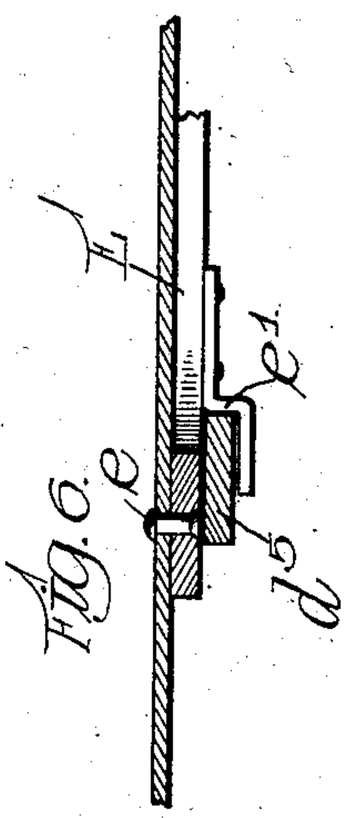

Fig. 6.

Fig. 3.

Witnesses:

Ira D. Perry

L. W. Downes Jr.

Inventor:

W. J. Grotenhuis

By Bulkley Stewart & Perry

Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM J. GROTENHUIS, OF ELKHART, INDIANA, ASSIGNOR TO SANITARY STEEL COUCH COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

BED OR COUCH.

973,778. Specification of Letters Patent. Patented Oct. 25, 1910.

Application filed April 2, 1909, Serial No. 487,413. Renewed September 22, 1910. Serial No. 583,282.

To all whom it may concern:

Be it known that I, WILLIAM J. GROTENHUIS, a citizen of the United States of America, and resident of Elkhart, Elkhart county, Indiana, have invented a certain new and useful Improvement in Beds or Couches, of which the following is a specification.

My invention relates to couches and beds, and more particularly to those which are used either as couches or beds, such, for example, as the folding couches that are used as such during the day, but as beds at night, and especially to those employing a metallic fabric as the supporting medium. As heretofore constructed, couches of this character have been provided with a set of springs below the metallic fabric, thus giving the structure the stability and firmness necessary for couch purposes. With this provision several persons could sit comfortably on the couch at the same time. On the other hand, however, it makes the same too hard and unyielding to be entirely satisfactory when used as a bed.

My invention contemplates, therefore, a bed or couch having a yielding supporting medium upon which the body of a person may rest comfortably for sleeping purposes, when the couch is used as a bed, and having a set of springs that can be readily lifted into engagement with the under side of the said fabric, or which may be otherwise regulated or controlled, to convert the bed into a couch of sufficient stability and firmness to permit a person to sit or recline thereon with ease and comfort, it being understood that the supporting medium, such as a metallic fabric, alone makes the most satisfactory bed, and that the fabric and springs together make the most satisfactory couch. Thus, broadly stated, I add or subtract the supporting strength and stability of one medium by movement thereof relative to the other, by mechanism for this purpose, such as levers, excavators or other devices which will determine the degree of operation or relative movement necessary to get the desired result.

In the accompanying drawings—Figure 1 is a longitudinal section of a couch or bed embodying the principles of my invention. Fig. 2 is a plan of the same, showing the sides broken away for convenience of illustration. Fig. 3 is an enlarged plan view of an end portion of the couch or bed, showing the operation, in dotted lines, of the lever mechanism for raising and lowering the springs. Fig. 4 is a detail section on line 4—4 in Fig. 3. Fig. 5 is an elevation of the mechanism shown in Fig. 3, looking in the direction of the length of the couch. Fig. 6 is a section on line 6—6 in Fig. 3.

As thus illustrated, the body A of the couch or bed, and the metallic fabric B stretched across the top thereof, may be of any suitable construction. The folding sides C are hinged to the body, and may be supported in any suitable manner. As shown, said fabric is of the kind known as "slat-fabric", being composed of longitudinal slats b attached to the ends of the form or body by means of helical springs b' and tied together by cross links b^2, thus providing a flat and flexible and yielding support. This fabric makes a very comfortable and satisfactory bed. A couch, however, must have more stability and firmness than a bed, and must not sag and yield as does the said fabric when unsupported by springs. In order, therefore, that the said bed may also serve as a couch, a set of spiral springs D is provided below the fabric B, being mounted upon a frame d, as shown. Three rods or wires d' are bolstered to the end of the frame or body A, below the fabric, and are connected at their other ends by helical springs d^2 to the said frame d. Another set of rods or springs d^3 are connected by similar helical springs d^4 with the other end of the frame d. A link d^5 has a pivotal connection d^6 with the converging ends of the rods d^3, said link being connected by a stay rod d^7 with a side mem- the other end of the frame d. A link d^5 is pivoted at its outer end to the shorter end of a bell crank lever E, which latter is pivoted at e upon the under side of the end member a of the frame or body A. This lever E has a stop e' adapted to engage the link d^5 when the springs are raised, thus locking itself in this position—that is to say, the lever E swings past the center, and thus the pull keeps the stop e' against the link d^5, as shown. When the lever E is swung into the position shown in dotted lines in Fig. 3, then the springs D are lowered out of contact with the fabric. Or the springs D can be regulated or controlled to simply vary their tension on the fabric.

When the springs D are up, as shown in Fig. 1, the structure is then suitable for use as a couch, as the said springs lend stability and firmness to the fabric, making it possible for a person to sit or recline thereon with ease and comfort. When the couch is to be used as a bed, and it is desired that the user shall have the full benefit of the flexibility and resilient qualities of the fabric B, then the springs D are lowered. Thus these springs are only used when they are needed. By means of the turn buckles F on the rods d^3 the tension of the springs D on the fabric B can be varied at will to suit requirements.

It is an important consideration of my invention that the raising and lowering mechanism be of such character that it will determine the high and low positions of the springs below the fabric. The mechanism shown is a combination of levers and links, so arranged as to give an eccentric action, whereby the mechanism locks itself in position to hold the springs up against the under side of the fabric. Thus the said springs only have two positions, either clear up or clear down, as the case may be. There are no intermediate positions, and the user does not have to determine the desired position. The mechanism itself determines the position necessary to secure the desired result. Furthermore, a single act of the user is sufficient to either raise or lower the springs.

What I claim as my invention is:

1. In a bed or couch, a metallic fabric, springs below the same, mechanism for raising and lowering the said springs, said mechanism having only two operative positions, to determine the high and low positions of the springs.

2. In a bed or couch, a metallic fabric, springs below said fabric, and a lever mechanism for raising and lowering said springs, said mechanism having only certain definite operative positions to determine the positions of the springs, a device for manually operating said mechanism, and a frame upon which all of said elements are supported.

3. In a bed or couch, a metallic fabric, a set of spiral springs below the said fabric, mechanism for lifting said springs into contact with said fabric and lowering the same out of contact therewith, said mechanism having only two operative positions, a frame to which the fabric is fastened, and a manually manipulated element for controlling said mechanism, said element movably mounted on the frame.

4. In a bed or couch, a metallic fabric, a set of springs beneath said fabric, means operating on the lower ends of said springs for causing the latter to either support or not support the weight of a person on said fabric, mechanism for operating said means, said mechanism having provisions for limiting said means to determinate positions, a frame to which the fabric is fastened, and a manually manipulated element for controlling said mechanism, said element movably mounted on the frame.

5. In a bed or couch, a support for the person, springs below the same, mechanism for controlling all of said springs and a single handle for operating said mechanism.

6. In a bed or couch, a yielding support, a set of springs below said support, means operative by a single act of adjustment to control the pressure of said springs on the under side of said support, a frame supporting said elements, and a handle by which said means are operated without disconnection of the springs from the frame.

7. In a bed or couch, a flexible support, a set of springs below said support, a lever at one end of same for manually controlling the pressure of the springs thereon, said lever having provisions for determining the degree of pressure necessary for the desired purpose, a support for the springs, and link connection between said support and lever.

8. In a bed or couch, a flexible fabric support, a set of springs below said support, means comprising pivoted and fulcrumed elements for moving said springs up and down, for the purpose described, a frame supporting said elements, and a handle by which said means are operated without disconnection of the springs from the frame.

9. In a bed or couch, a support, a set of springs below the support, and means including a lever for raising and lowering said springs, said lever adapted to lock itself in position to keep the springs pressed against the under side of said support.

10. In a bed or couch, the combination of two supporting mediums, one above the other, means for combining the supporting strength and stability of the two mediums, by movement of one relative to the other, to superimpose one upon the other, and means for determining the position of the movable medium, the movable medium adapted to pass from high to low position, or vice versa, without disconnection of any portion thereof, which movable medium is without means for sustaining it in intermediate positions.

11. In a bed or couch, two supporting mediums, one above the other, and means comprising pivoted and fulcrumed operating elements at the end of the bed or couch for withdrawing the supporting strength and stability of one medium by movement thereof relative to the other.

12. In a bed or couch, two supporting mediums, one above the other, and means comprising pivoted and fulcrumed operating elements at the end of the bed or couch for combining the supporting strength and sta-

bility of the two mediums, by movement of one relative to the other, the lower medium being springy or yielding in character, to cushion the upper medium, the movable medium adapted to pass from high to low position, or vice versa, without disconnection of any portion thereof, which movable medium is without means for sustaining it in intermediate positions.

13. In a bed or couch, a frame, two supporting mediums, one above the other, and means comprising an eccentric device mounted on the frame and connected for controlling one medium by movement thereof relative to the other, to decrease the stability of the latter, the lower support being yielding in character, and a handle for operating said eccentric device.

14. In a bed or couch, a frame, two supporting mediums, one above the other, and means comprising an eccentric device mounted on the frame and connected for combining the supporting strength and stability of the two mediums, by movement of one relative to the other, the lower support being provided with helical springs sustaining the weight thereof, and means for operating said eccentric device.

15. In a bed or couch, a frame, two supporting mediums, one above the other, and means comprising an eccentric device mounted on the frame and connected for withdrawing the supporting strength and stability of one medium, by movement thereof relative to the other, the lower support being provided with helical springs sustaining the weight thereof, and means on one end of the frame for operating said eccentric device.

16. In a bed or couch, two supporting mediums, one above the other, means comprising pivoted and fulcrumed elements for combining the supporting strength and stability of the two, by movement of one relative to the other, the lower support being yielding in character, and additional means for varying the pressure of one medium on the other.

17. In a bed or couch, two supporting mediums, one above the other, means comprising an eccentric device operable about a vertical axis for withdrawing the supporting strength and stability of one medium, by movement thereof relative to the other, the lower support being yielding in character, and additional means for varying the pressure of one medium on the other.

18. In a bed or couch, two supporting mediums, one above the other, means comprising an eccentric device operable about a vertical axis for combining the supporting strength and stability of the two mediums, by movement of one relative to the other, the lower support being provided with helical springs sustaining the weight thereof, said springs subject to the action of said eccentric device, and additional means for varying the pressure of one medium on the other.

19. In a bed or couch, two supporting mediums, one above the other, means comprising an eccentric device operable about a vertical axis for withdrawing the supporting strength and stability of one medium, by movement thereof relative to the other, the lower support being provided with helical springs at each end thereof, sustaining the weight thereof, and additional means for varying the tension of said springs and the pressure of one medium on the other.

20. A combined couch and bed comprising a supporting fabric, a unitary supporting member permanently disposed below said fabric, mechanism for bodily raising and lowering said member, without disconnection thereof, to vary the character of the support provided by said fabric, said mechanism having provisions for determining the desired position of said member, consisting of a movable operating element, and means whereby said element is operative only in certain predetermined positions thereof.

21. A combined couch and bed comprising a supporting fabric, a set of coil springs permanently disposed below said fabric, and connected together to form a unitary supporting member, lever mechanism for raising and lowering said member, without disconnection thereof, to vary the character of the support provided by said fabric, said mechanism having provisions for determining the position of said springs, consisting of a movable operating element, and means whereby said element is operative only in certain predetermined positions thereof.

22. In a convertible couch and bed, a frame and a flexible supporting fabric thereon, a stiffening means for the fabric, located thereunder, and means for quickly raising and lowering said means into and out of action, for the purpose set forth, said means including devices for locking the stiffening means while in action, these locking devices including a movable element which is operative only in two positions thereof.

23. In a convertible couch and bed, a frame and a flexible supporting fabric thereon, a stiffening means for the fabric located thereunder, and means for quickly raising and lowering said means into and out of action, for the purpose set forth, said means including devices for locking the stiffening means while in action, these locking devices including a lever element pivoted on the frame.

Signed by me at Chicago, Illinois, this 4th day of February, 1909.

WILLIAM J. GROTENHUIS.

Witnesses:

CLARENCE E. TAYLOR,

E. H. CLEGG.