

(No Model.)

F. G. GALE.
WIRE MATTRESS AND FRAME THEREFOR.

No. 585,664.

Patented July 6, 1897.

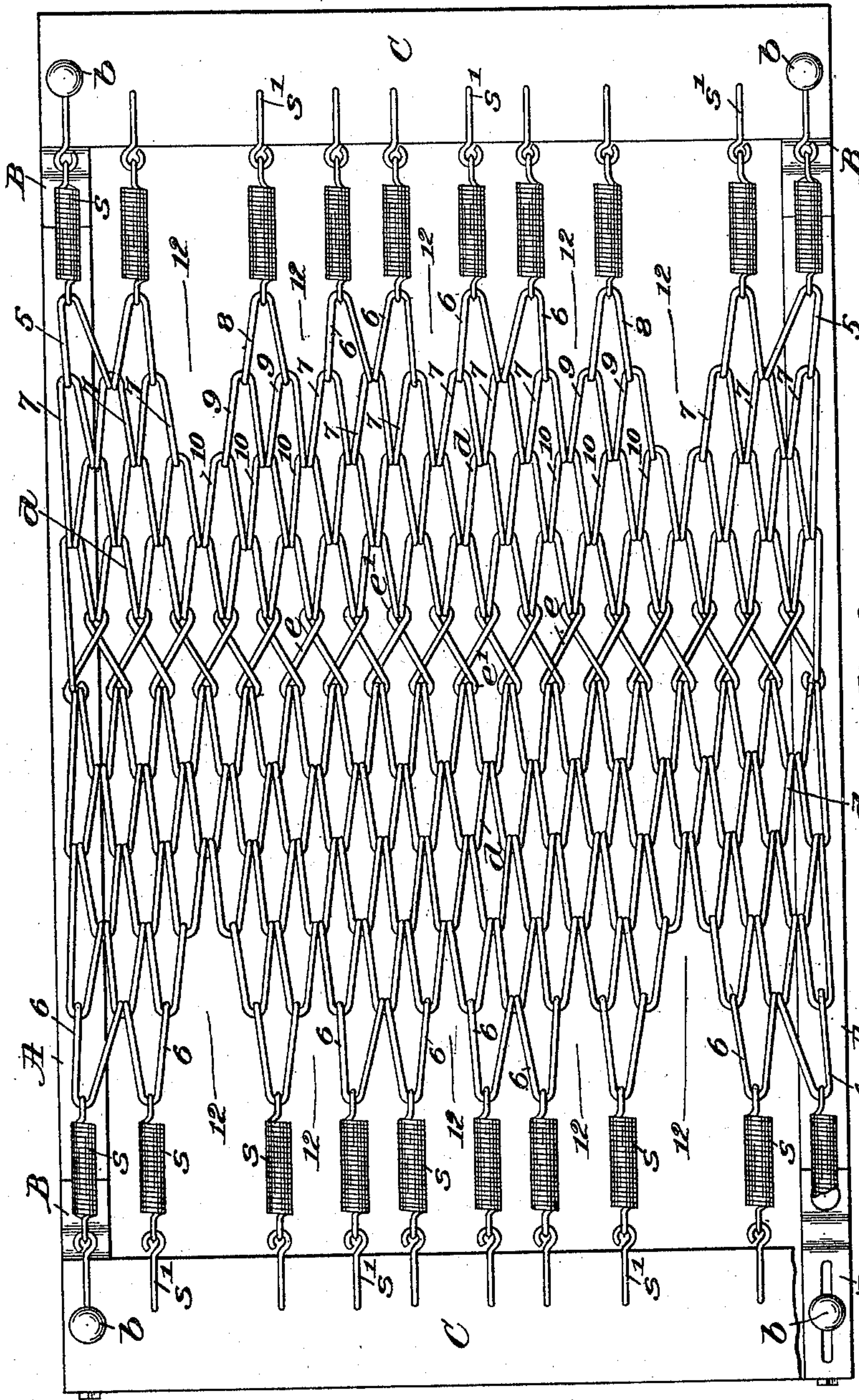


Fig. 1.

Witnesses.

Frederick S. Grunk of.

Thomas J. Drummond

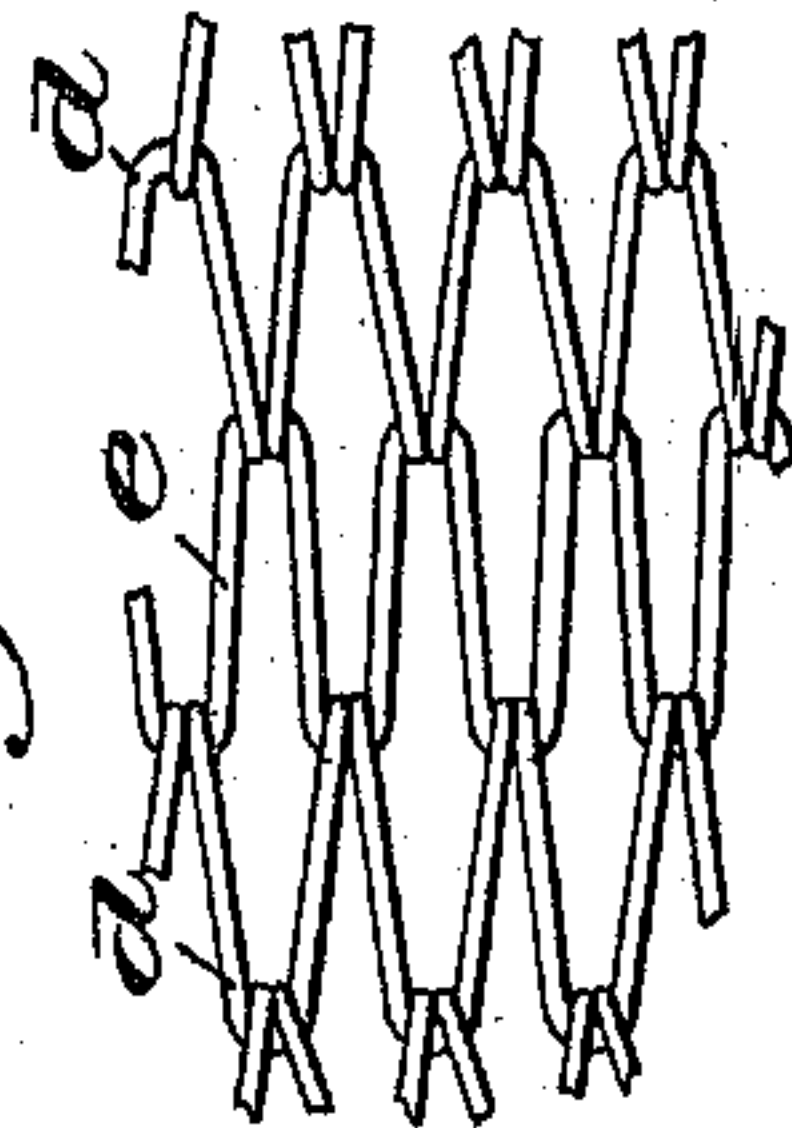


Fig. 3.

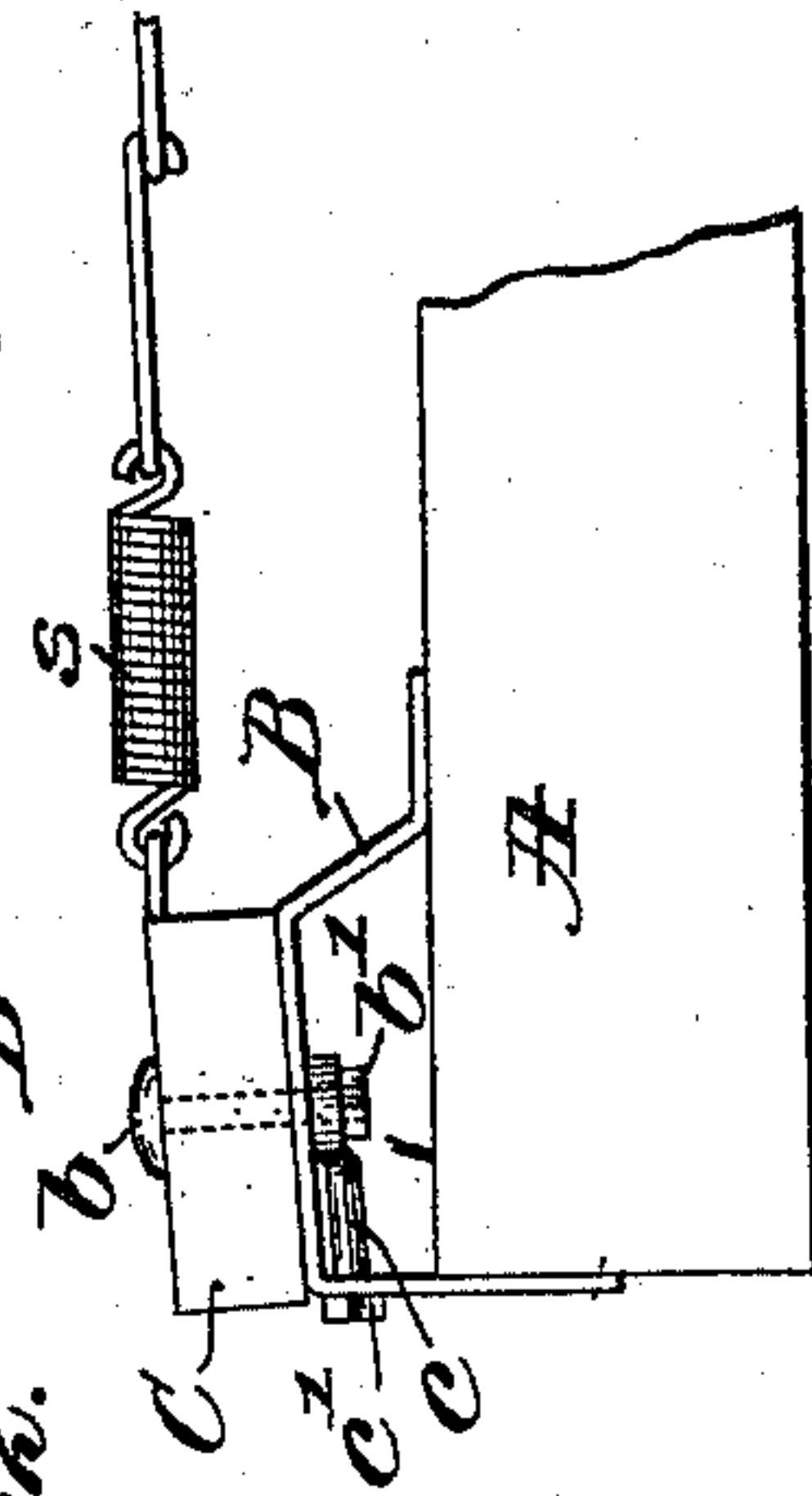


Fig. 2.

Inventor
Francis G. Gale.
by Crosby & Gregory
attys.

UNITED STATES PATENT OFFICE.

FRANCIS G. GALE, OF WATERVILLE, CANADA.

WIRE MATTRESS AND FRAME THEREFOR.

SPECIFICATION forming part of Letters Patent No. 585,664, dated July 6, 1897.

Application filed August 24, 1894. Serial No. 521,192. (No model.) Patented in England May 16, 1895, No. 10,322.

To all whom it may concern:

Be it known that I, FRANCIS G. GALE, a subject of the Queen of Great Britain, residing at Waterville, Province of Quebec, Dominion of Canada, have invented an Improvement in Wire Mattresses and Frames Therefor, of which the following description, in connection with the accompanying drawings, is a specification, like letters and numerals on the drawings representing like parts, said invention and improvement being illustrated and described in my British Patent No. 10,322 of May 16, 1895.

This invention relates to wire mattresses of that class composed of A-shaped wire links arranged in transverse rows, the legs of the links of one series being hooked to the apices of the links of the next adjacent series.

One of the principal objects of this my present invention is to improve the construction of mattresses of the type referred to in order to render the same less apt to draw in at the sides or narrow under the action of a weight sustained for a considerable period thereupon. In my experiments to devise a mattress which should successfully withstand this narrowing tendency I have found that within certain practical limits the greater the number of independent links concentrated in a single transverse row or series the stiffer that row or series and the less liable to narrow in or contract when sustaining a weight. On the other hand, as there is usually a sustaining-spring for and connected to each link of the end row the greater the number of links in the said end rows the greater the number of connected springs and the stiffer or harder the mattress. To improve mattresses of this type, it is desirable to combine a large number of links in each transverse series at the middle of the mattress to prevent the latter drawing in or narrowing under the action of the weight sustained thereupon, but without increasing the number of sustaining-springs at the end of the mattress, and this by my invention I accomplish by the omission of one or more links from the end row or rows of links in the mattress, whereby each link or group of links in the end row receives the entire pull or strain from a greater number of links in the next adjacent row or

rows, so that fewer springs may be used than there are independent links in any of the rows at or near the middle of the mattress.

To further prevent the narrowing in of the mattress at the sides, I face the A-shaped links at opposite sides the middle of the mattress in opposite directions—that is, the apices of the links, starting from the middle, face toward the opposite ends of the mattress, and the legs of the adjacent middle rows of links, which come together and face each other, are joined by a continuous zigzag wire connection, which by reason of its peculiar shape materially assists in resisting the drawing-in or narrowing tendency.

My invention further comprehends certain improvements in means for adjusting the end rails of the mattress-frame to secure the proper tension for the mattress, which improvements will be hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is a plan view, partially broken away, of a mattress embodying one form of my invention; Fig. 2, a detail looking from the side and at one end of the mattress-frame, showing the means for adjusting the tension; and Fig. 3, a modification showing a different form of zigzag intermediate connection.

Referring to the drawings in the particular embodiment of my invention there shown, A A are the side rails of the mattress-frame, the same at their opposite ends being provided, as herein shown, with steps B, preferably formed of a continuous strip of flat bar-steel shaped substantially as shown in Fig. 2 and slotted, as indicated in dotted lines in said Fig. 2 and in the broken corner, Fig. 1, to receive the bolt *b*, passed through the end of the end rail C of the mattress-frame. The bolt *b*, moving in the slot referred to, constitutes a guide for the adjustment of the said end rail, and to effect adjustment of the said rail I have, as herein shown, provided an adjusting-bolt *c*, through the eye-head of which is passed the threaded end of the bolt *b*, the end of which receives a nut *b'*.

The threaded end of the bolt *c* is extended through the outer end of the step B to receive outside the latter the adjusting-nut *c'*.

The rails C are drawn toward the ends of

the side rails A by rotation of the clamping-nuts *c'* at opposite sides of the bed, and the said end rails C may be further clamped in their adjusted positions by means of the nuts *b'*, which constitute one form of clamping device.

My improved mattress, as herein shown, is composed principally of Λ -shaped links *d d*, arranged in lateral or transverse rows or series, the legs of the links of each row being hooked to the apices of the links of the next adjacent row, the links of the several rows starting from the transverse middle of the mattress facing in opposite directions—that is, from the transverse middle the apices of the links face toward the opposite ends of the mattress. The legs of the adjacent middle rows of links face each other, as best shown in Fig. 1, and in accordance with one part of my invention are united by means of one or more zigzag wire connections *e*, one only being shown, the same extending continuously from side to side of the mattress and preferably twisted at each turn to form eyes *e'*, which receive the hooked ends of the links *d* of the said adjacent rows or series, although the said zigzag connection may be formed without the eyes *e'*, as shown in Fig. 3, the presence of the eyes, however, rendering the said zigzag connection, as I believe, stiffer, and thereby better calculated to resist the narrowing of the mattress under the action of a weight sustained thereupon.

It will be noticed that the several rows of links immediately adjacent and at opposite sides of the intermediate connection *e* are made up of uniform series or successions of links hooked together in the manner described and that were all the rows of links extending from the middle to the end of the mattress made up of uniform transverse series in this manner there would be required as many springs to sustain the ends of the mattress as there were links in each end series and that there would therefore be as many springs as there were links in the series at the middle of the mattress. As before mentioned, however, I wish to increase the number of links in each transverse series at the middle of the mattress, but do not wish to increase the number of springs in proportion thereto, and for this reason I omit a link at short intervals in the end row or rows of links, thereby reducing the number of links in said end row and the number of springs necessary to sustain the same.

Referring to Fig. 1, it will be noticed that throughout the greater part of the end rows of the mattress every third link is omitted, so that two links 6 6 take the entire pull of three links (marked 7) in the next row hooked thereto, and that near the sides of the mattress I have omitted from the ends of the series 5 in one instance two successive links, so that a single link 8 takes the entire pull of the two links 9 9, hooked thereto, and the two latter the entire pull of the three links 10 in

the third row. By reducing the number of links in the end row or rows as thus described, so that each link 8 or group of links 6 in the end row takes the entire pull or strain of a greater number of links in the adjacent row or rows, the number of springs is kept down to that found to be best suited for ease and durability, yet without requiring the number of links in the several transverse series at the middle of the mattress to be correspondingly reduced. On the other hand, by the proper proportioning of the links any single spring at the end of the mattress may be made to take the entire pull of any number of links several rows therefrom, enabling the number of links in any of the latter rows to be made as large as desirable. A further advantage is gained by this arrangement, for it will be noticed that wherever one or more links is omitted from a row a Λ -shaped or tapering line of weakness 12 is formed, leading from the end of the mattress inwardly toward the middle thereof, these lines of weakness, of greater or less length and width according to the number of links omitted, making the mattress easier and more flexible under the shoulders than would be the case were no links omitted.

In practice I have found that a mattress constructed as herein shown and described—that is, with the Λ -shaped links at opposite sides the transverse center facing in opposite directions, with their apices toward the ends of the mattress, and with the legs of the abutting series at the middle of the mattress connected by a continuous zigzag connection—is capable of sustaining a heavy weight for a long period of time without perceptibly narrowing at the sides, whereby I am enabled to dispense with the usual connections between the edges of the mattress at its middle, and the side rails usually employed keep the said mattress from narrowing, and that, further, the increase in the number of links in any transverse series made possible by my novel arrangement of links at the ends of the mattress, enabling the number of springs to be kept down, notwithstanding the increase in the number of links of the transverse series at the middle, perceptibly increases the lateral stiffness of the mattress.

In the mattress illustrated I have in each end series shown groups of two links taking the pull of three in the second series and also a single link taking the pull of two of the second series and three in the third series, and while both of these arrangements, with others, if desired, may be incorporated in a single mattress, yet in ordinary practice it would probably be sufficient to use one uniform arrangement—that is, form the end series entirely of single links taking the pull of two in the second and three in the third row, or of groups of links in the first row taking the pull of a greater number in the second row.

The springs *s s* are connected at one of their ends to the links of the end rows or se-

ries and at their opposite ends to eye connections s' , secured to the end rails C.

Where the links are arranged in groups, as shown at 6 6, Fig. 1, the links of the end rows may and preferably will be slightly distorted in shape, so that a proper pull may be exerted upon the springs.

Were the links of regular form, the springs connected to each group would naturally be drawn inwardly at their ends, which I wish to avoid.

My invention is not restricted to the particular arrangement and construction of links herein shown, for the same obviously may be varied without departing from the invention.

Having described one embodiment of my invention and without limiting myself as to details, what I claim as new, and desire to secure by Letters Patent, is—

1. The herein-described mattress, the same consisting of a plurality of transverse rows of resilient Λ -shaped wire links, the legs of the links of each row being hooked to the apices of the links of the adjacent row, the number of links in the body-rows being substantially the same, the number of links in the end row being less than the number in the body-rows, the number of links in successive rows from the end toward the middle gradually increasing until the full body-rows are reached, to thereby provide a constantly-diverging field of tension for and having its apex at each Λ -shaped link of the end series, and springs connected with the links of the said end series and fewer in number than the number of links in the body series, whereby the body of the mattress possesses the flexibility and ease due to a large number of relatively small links with a relatively small number of sustaining-springs at the end of the mattress, substantially as described.

2. The herein-described mattress consisting of a plurality of rows of resilient Λ -shaped wire links, the legs of the links of each series being connected with the apices of the links of the next adjacent series, said links adjacent the end of the mattress being arranged to present one or more lines of weakness extending from the end of the mattress inwardly, for a distance exceeding the length of the end-most row of links, to thereby provide a flexibility exceeding that due to the spaces be-

tween adjacent links of full rows, substantially as described.

3. The herein-described mattress, the same consisting of a plurality of Λ -shaped links arranged in transverse rows or the links at opposite sides the transverse middle of the mattress facing in opposite directions, and a long transverse zigzag connection joining facing legs of the adjacent links at the middle of the mattress, substantially as described.

4. The herein-described mattress, the same consisting of a plurality of Λ -shaped links arranged in transverse rows, the links at opposite sides the transverse middle of the mattress facing in opposite directions, and a continuous transverse zigzag connection joining the facing legs of the adjacent links at the middle of the mattress, and having eyes to which the said legs are hooked, substantially as described.

5. A mattress-frame comprising side and end rails and slotted supports for the latter on and raised above the top of the former, bolts on the said end rails extended through and guided by the slots in the said raised supports, and adjusting devices arranged above said side rails and beneath the said end rails and connected with the said bolts for adjusting the position of the said end rails, substantially as described.

6. The combination with a suitable frame, of a wire mattress suspended at its ends by springs hung from said frames, said mattress comprising wires bent or arranged to present diverging portions the angle of divergence between which is of such acuteness that the diverging area of pressure developed by said diverging portions of the mattress-wires when a weight is sustained upon the mattress in any of the positions actually assumed by persons resting thereupon shall fall, at or substantially at the ends of the mattress, entirely within the portion of said ends, which are sustained by said end springs, substantially as described.

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

FRANCIS G. GALE.

Witnesses:

OLIVIA T. GALE,
H. S. MELUNG.