

F. M. JEFFERY.

SPRING BED OR BED BOTTOM.

No. 385,118.

Patented June 26, 1888.

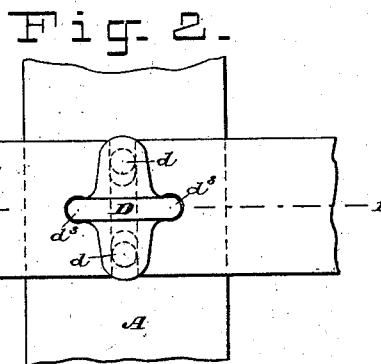
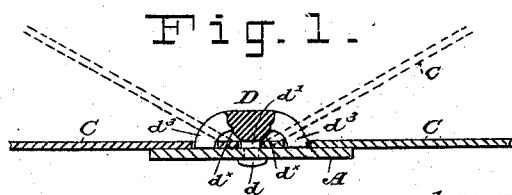


Fig. 3.

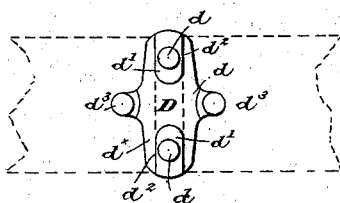


Fig. 4.

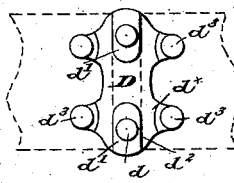


Fig. 5.

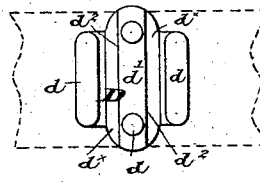


Fig. 7.

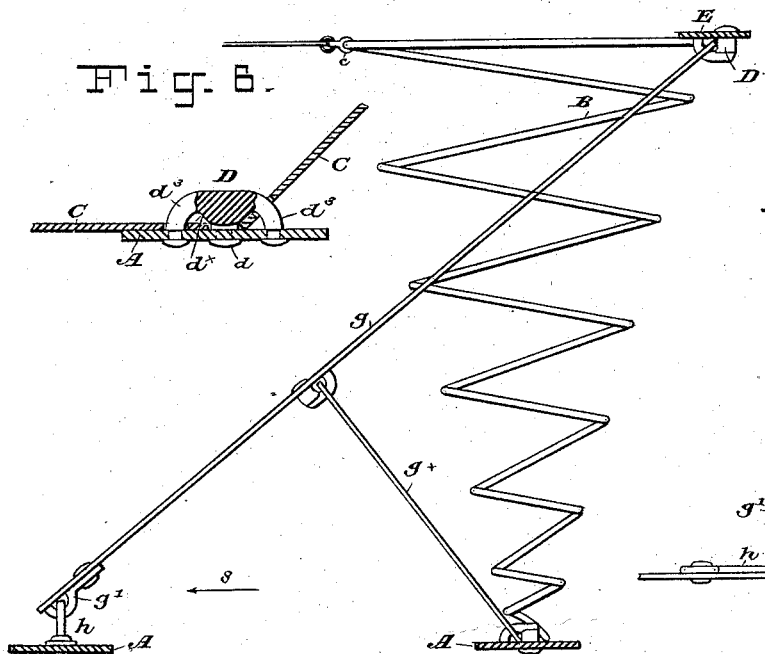
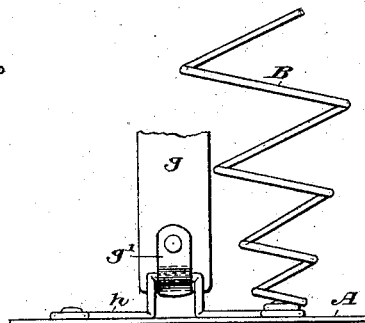


Fig. 8.



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(No Model.)

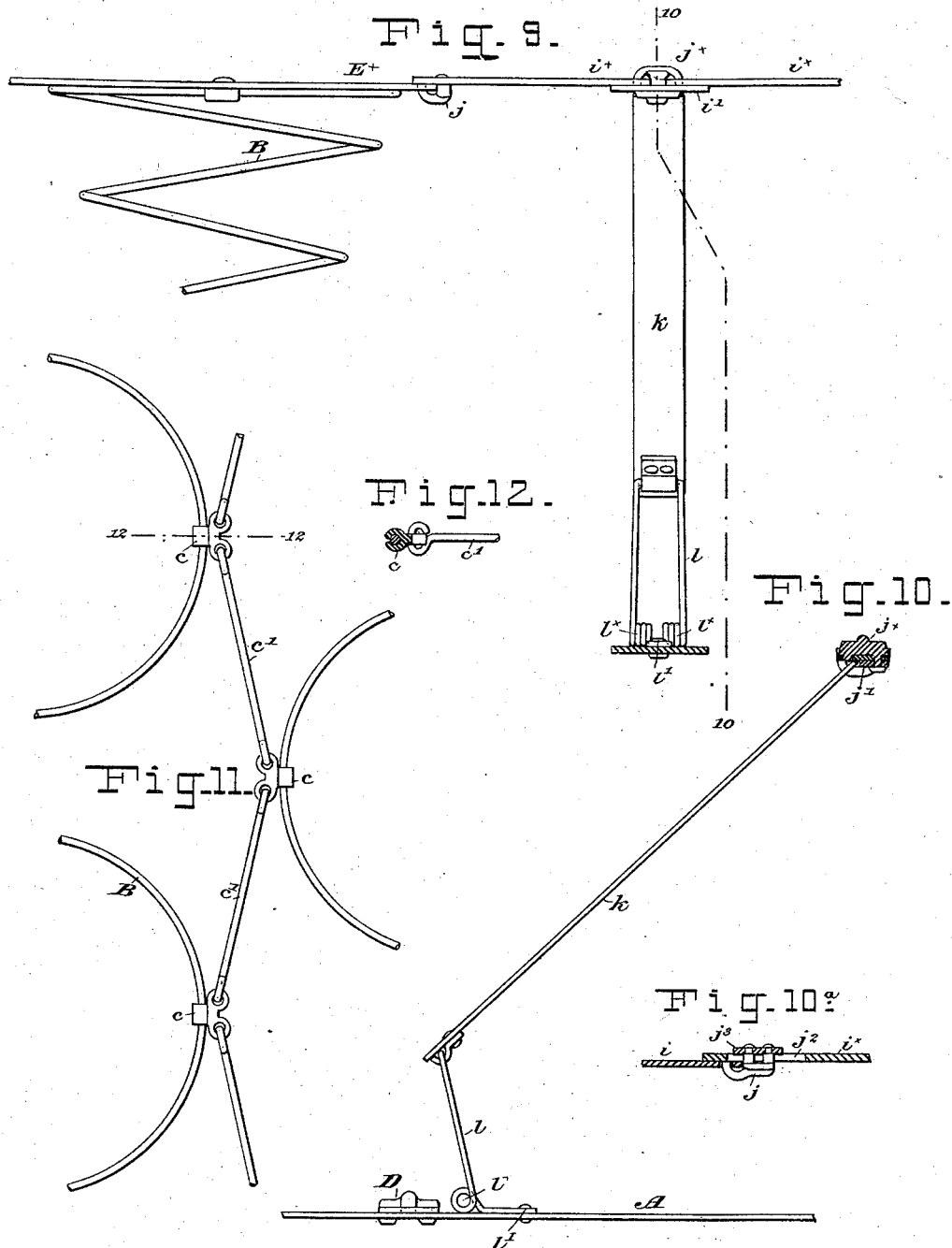
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F. M. JEFFERY.

SPRING BED OR BED BOTTOM.

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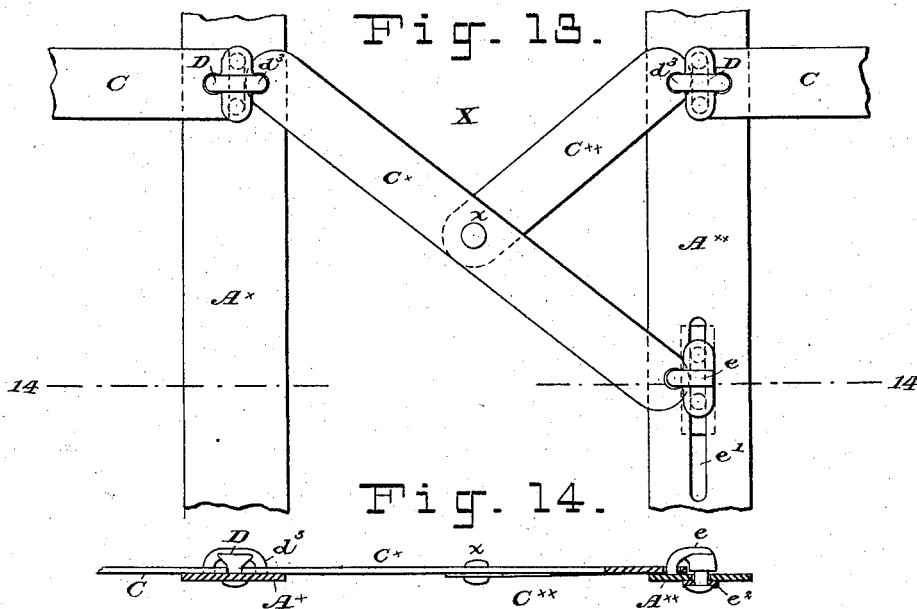


Fig. 14.

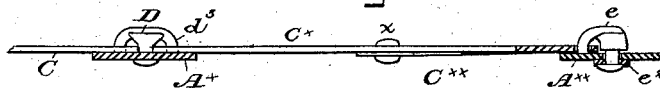
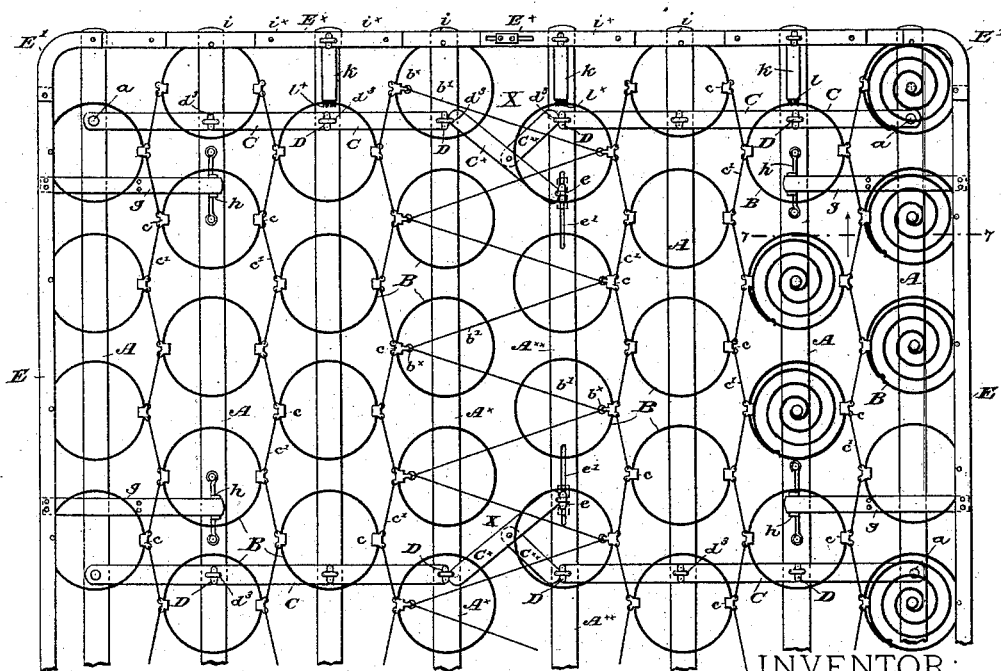


Fig. 15.

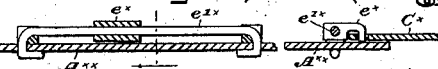


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Fig. 14<sup>2</sup>

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# UNITED STATES PATENT OFFICE.

FRANK M. JEFFERY, OF JERSEY CITY, NEW JERSEY.

## SPRING BED OR BED-BOTTOM.

SPECIFICATION forming part of Letters Patent No. 385,118, dated June 26, 1888.

Application filed March 9, 1887. Serial No. 230,100. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK M. JEFFERY, a citizen of the United States, and a resident of Jersey City, Hudson county, New Jersey, have invented certain Improvements in Spring Beds or Bed-Bottoms, of which the following is a specification.

My invention relates in the main to spring beds or bed-bottoms constructed wholly of metal, and particularly to those adapted to roll up.

The object of my invention is in part, to provide an improved means for hinging the slats together, and an improved hinging-plate for hinging the various elements of the bed together; in part to provide a top frame or rail of a novel construction for a roll-up bed; in part to provide suitable braces to support the bars of said top frame; in part to provide a novel means of connecting together the tops of the springs of a spring bed-bottom; in part to provide a novel connecting-hinge for connecting the slats of a bed-bottom, whereby the bed may be collapsed as well as rolled up, and a lacing device to be used in connection with said collapsing hinges for connecting the tops of the springs.

My invention will be fully described hereinafter, and its novel features carefully defined in the claims.

In the drawings, which serve to illustrate my invention, Figure 1 is a section through a slat, distancing-links, and hinge-plate, showing the construction of same. The plane of the section is indicated by line 1 1 in Fig. 2. Fig. 2 is a plan of the parts shown in Fig. 1. Fig. 3 is an under side view of the hinge plate detached. Figs. 4, 5, and 6 illustrate several forms of the hinge-plate. These will be fully described hereinafter. These views are on a large scale. Figs. 7 and 8 are detached views illustrating the construction of the brace for the top side rail or side bar of the top frame of the bed-bottom. Figs. 9 and 10 are similar views illustrating the construction of the brace for the top end rail or end bar of the top frame of the bed-bottom. Fig. 10<sup>a</sup> illustrates the slide at the middle part of the end bar of the top frame or rail. Figs. 11 and 12 are detached views illustrating the construction of the devices for connecting the springs at their tops. The latter is a section on line 12 12 in Fig. 11. Figs. 13 and 14 are views illustrating the construction of the collapsing parallel-movement hinge

of the bed-bottom, the latter being a section on line 14 14 in Fig. 13. Fig. 14<sup>a</sup> illustrates a modification of the slide seen in Fig. 13. Figs. 7 to 14<sup>a</sup>, inclusive, are drawn to a scale about one-half that of the first six figures. Fig. 15 is a plan view of about one-half of the bed-bottom complete, on a scale about one-eighth that of the first six figures.

Referring to Figs. 1, 2, 3, and 15, A represents the slats of the bed, (in this case strips of metal,) on which are mounted the springs B. C C are the distancing-links, also made of flat strips of metal, of the proper length to suitably space or distance the slats when the bed-bottom is extended for use and arranged flat-wise on the slats. D D are the hinge-plates secured to the slats.

I may say here that I ordinarily employ three series, rows, or sets of distancing-links C, one series near each end of the bed-bottom and one at about the middle of same; but as these are all alike I will only need to describe one set. As all the hinge-plates will be alike, I will only describe one.

The hinge-plate D will be made, by preference, from malleable iron. It has two riveting or securing studs, *d d*, projecting downward from a base or bases, *d'*, and these bases have faces *d''* for the ends of the links C to abut against from opposite sides. The hinge-plate is also provided on its opposite edges with curved hinging-prongs *d<sup>3</sup> d<sup>3</sup>* to receive the ends of the respective links C, the latter being each provided with a hole at its end to engage said prong *d<sup>3</sup>*. When the hinge-plate is placed on the slat A and riveted down thereon, the ends of prongs *d<sup>3</sup>* rest on and bear against the face of the slat. The butts of the links C are squared or cut at right angles to their sides, as indicated by dotted lines in Figs. 2 and 3, and these squared ends abut against the vertical faces *d''*. These faces being carefully arranged to stand parallel with the axis of the slat A, it will be seen that the abutment of the ends of the links thereagainst preserves the perpendicularity of the links with respect to the slats.

I may use two prongs, *d<sup>3</sup>*, on each edge of the hinge-plate D, as seen in Fig. 4, to engage two holes punched in the link; or I may use a broad prong, *d<sup>3</sup>*, as seen in Fig. 5, to engage a hole of corresponding form in the link. The two bases *d' d'* (seen in Figs. 3 and 4) may be joined to form one base, extending the whole length of the plate. This is also shown in Fig.

5. Instead of merely resting on or touching the slat, as shown in Fig. 1, the prongs  $d^3$  may pass through holes in the slat and be riveted, as seen in Fig. 6. I prefer the construction seen in Figs. 1, 2, and 3, for the reason that it is somewhat more troublesome to punch two or more holes in a slat or link arranged in line crosswise of the plate than when they are arranged in line lengthwise of the plate. The reason for employing two bases,  $d^1$ , in lieu of one long base is that it takes less metal and answers the purpose equally well.

In rolling up a bed-bottom constructed in this manner the links C assume the positions indicated by dotted lines in Fig. 1, thus forming a polygonal roll. The ends or butts of the links when the bed-bottom is rolled up will abut against the slat and the bases  $d$  of the plate at their line of junction, or nearly so. When the bed-bottom is laid flat, the links will not only properly distance the slats, but will obviate any tendency to cornerwise or oblique distortion of the bed-bottom. To preserve the rigidity of the structure and prevent the links from rising off the slats at their hinged ends by slipping up on prongs  $d^3$ , I provide the under side of the hinge-plate D with an overhanging inclined surface,  $d^4$ . (Seen best in Figs. 1 and 6.) This inclined surface overhangs the end or butt of the link and it forms a stop, against which the upper face of the link bears when the bed-bottom is rolled up.

Referring to Fig. 15, it will be seen that the links C of the several series that connect with the marginal slats of the bed-bottom are not or need not be hinged to the slat. By preference they are riveted thereto, as seen at  $a$  in said figure.

I may say that I am perfectly well aware that the hinging together of the slats of a spring-bed by links in order that it may be rolled up is a well known device, and I do not claim this, broadly. My present invention relates to the peculiar and novel construction and arrangement of the hinge-plates and links.

In order to enable the bed-bottom to be extended or contracted laterally within limits to suit it to beds of different widths, I provide what I have called "parallel movement collapsing hinges," and these I will now describe with reference to Figs. 13, 14, and 15. Fig. 13 is a plan of this hinge or hinge device detached, and Fig. 14 is a cross-section.

At the middle space, X, of the bed-bottom the distancing-links C are omitted, and the two slats  $A^x$  and  $A^{xx}$  adjacent to this space are connected by two hinge-links,  $C^x$  and  $C^{xx}$ , the former,  $C^x$ , being pivoted at its one end on the prong  $d^3$  of the hinge-plate D on slat  $A^x$ . The link  $C^{xx}$  is pivoted at its one end on the slat  $A^{xx}$  in a like manner. Link  $C^x$  extends across to slat  $A^{xx}$  diagonally, and at that end it is pivotally attached to a hinge-slide,  $e$ , mounted to play along a slat,  $e'$ , in the slat  $A^{xx}$ . The link  $C^{xx}$  only extends to link  $C^x$ , to which it is pivotally connected at  $x$  by a rivet or

other similar connection. It will be observed that the slide  $e$  is constructed substantially like the hinge-plate D, the only material difference being that one prong  $d^3$  is omitted as not essential, and the studs  $d$  are prolonged to extend through a washer-plate,  $e^2$ , on the lower face of the slat. There should be two of these hinging devices, one at each end of the bed, and there may also be one at the middle of the bed, as shown in Fig. 15. This hinge will permit of moving slats  $A^x$  and  $A^{xx}$  toward or from each other to a limited extent for collapsing and expanding the bed-bottom, the ends of the links  $C^x$  and  $C^{xx}$  being rounded to permit of their turning edgewise on the prongs of the hinge-plates. They will also permit the bed-bottom to be rolled up, as their pivoted ends will play on the prongs  $d^3$  in the same manner as the links C. It is this construction of the collapsing hinge, whereby the bed is permitted to roll up as well as collapse, that forms the important novel feature of this part of my invention. Collapsing hinges otherwise of this character, but not constructed to permit the bed to be rolled up by flexure of the hinges, have been before employed in beds.

In Fig. 14<sup>a</sup> I have illustrated a modification of this device, wherein the slotting of the slat is obviated by the mounting on the slat of a wire slideway or bearing,  $e^x$ , on which the slide  $e^x$  is mounted, as clearly illustrated in this view.

Although I have shown but one collapsing space, X, in the bed-bottom, and this arranged about the middle of the bed, there may be more than one, and it is not essential that such space be at the middle of the bed.

When the bed-bottom is collapsed or contracted by bringing together more or less nearly the slats  $A^x$  and  $A^{xx}$ , the springs B on these slats will also be brought closer together. I provide a lacing device for connecting these springs, whereby their connectors may be kept taut, which is illustrated in Fig. 15. This consists of rings or eyes  $b^x$ , attached to the top rings or coils of the several springs, and a lacing-cord,  $b'$ , rove through these eyes. The cord will, by preference, be of the material known as "picture-wire," which is of metal and flexible. This cord may be permanently attached at its one end, but at its other end must be detachable at its fastening, so that the slack can be taken up. In order that the springs may be brought closely together, I extend the lacing-wires across the tops of the springs and connect them to the outer sides of the springs. The advantage of this lacing device over those employed merely for connecting the tops of the springs of a spring-bed together consists in the convenience of taking up the slack of the cord and in the ability to bring the tops of the springs of adjacent rows as close together as may be desired.

Figs. 11 and 12 illustrate my improved connector for connecting the tops of the springs. To each spring is attached a clip,  $c$ , usually made of malleable iron, and provided with jaws

to be clamped around the wire of the spring and with two eyes to receive the ends of connectors  $c'$ , usually of wire. These have hooks formed on their ends to couple with the branches of the clip  $c$ . It will be seen that the springs of adjacent rows are not arranged oppositely, but in alternate order, and that the connectors or links  $c'$  are arranged in a zigzag manner between the rows of springs. Thus a link coupled to a spring in one row extends obliquely across to a spring in the opposite row, to which spring it is coupled. Another link extends from this last point back obliquely across to a spring in the first-named row. Two links are thus coupled to a spring at the same point, and springs in the same row are not coupled directly together.

My bed-bottom is formed with a top frame mounted on the marginal springs all around. This frame is strengthened by braces of novel construction, and in order that the bed-bottoms may roll up and collapse, the end bars of said frame have a peculiar hinged construction. These features will now be described with reference to Figs. 7, 8, 9, 10, 10<sup>a</sup>, and 15. The frame is composed of the side bars,  $E$ , and the end bars,  $E^x$ . Only one of the latter is shown in Fig. 15, as this figure shows but one end of the bed-bottom.

Referring to Figs. 7 and 8, (the latter of which is a view taken from arrow  $S$  in Fig. 7,)  $g$  represents the main brace for the side bar,  $E$ , and  $g^x$  the auxiliary brace. The brace  $g$  is made of a flat strip of metal, and is hinged to the under side of the side bar,  $E$ , by a hinge-plate,  $D^x$ , constructed substantially like hinge-plate  $D$  and operating the same. At its lower end brace  $g$  is coupled to what I call a "torsion-spring support,"  $h$ , by means of a hinging-clip,  $g'$ . This support  $h$  is made of spring-wire, has a bail formed in it to receive the clip  $g'$  and eyes formed in its ends, whereby said ends are secured rigidly to the second slat,  $A$ , of the bed-bottom by suitable rivets. The rivet that secures the spring  $B$  to the slat may serve as one, as seen in Fig. 8. Being quite long between its attaching-points, this support  $h$  forms a torsion-spring. Pressure on bar  $E$  will be transmitted through brace  $g$  to the bail of spring-support  $h$  and exert a torsional strain thereon. When the pressure is removed, the spring will "right" itself. The auxiliary brace  $g^x$  is composed of the same material as brace  $g$ , preferably, and is hinged to the marginal slat  $A$  at its foot and the brace  $g$  at its other end, hinging-plates precisely like plate  $D^x$  being used, by preference, to effect the coupling. This brace supports the longer brace,  $g$ , at its middle part, and by swinging on its lowermost hinging-point tends to draw in the brace  $g$  endwise as the spring is depressed, thus preventing the spring from being pushed outward at the top.

The end bar,  $E^x$ , of the top frame is composed of sections peculiarly hinged together. By inspection of Fig. 15 it will be seen that on each alternate slat  $A$  the spring  $B$  sets out near the

end of the slat because of the "staggering" of the springs. On each of these springs is mounted and secured by a clip a short section,  $i$ , of the end bar,  $E^x$ , and to the opposite ends of these sections  $i$  are hinged short sections  $i^x$ , the hinges  $j$  employed being the same substantially as the hinge-plates  $D$  or  $D^x$ , before described. The two adjacent or meeting ends of the sections  $i^x$  stand close together, and are hinged to a short plate,  $i'$ , by a hinge-plate,  $j^x$ . Such a bar will not yield to edgewise pressure, but will bend or flex at the hinges when the bed-bottom is rolled up, the hinge at  $j$  "breaking" upward and the hinge at  $j^x$  breaking downward.

Thus by employing short sections arranged to flex or fold in succession in opposite directions the sections of the bar are made to fold together in a zigzag form, so as to "take up" the bar when the bed is rolled up. Heretofore, so far as I am aware, "roll-up beds," properly so called, have not been provided with continuous top rails owing to the difficulty in taking up the length of the end bar of the top rail so as to permit the bed to roll up.

A brace,  $k$ , abuts on the slat  $A$  intermediate between the slats bearing the springs to which sections  $i$  are secured and takes under the plate  $i'$ . It is hinged to  $i'$  by means of a hinge-plate,  $j'$ , and is coupled at its foot to a spring-support,  $l$ , illustrated in Figs. 9 and 10. This support comprises a long bail formed in a piece of spring-wire, the ends of the wire being bent into two coils,  $l^x$ , and then formed into an eye to receive a rivet,  $l'$ , whereby the support is secured to the slat  $A$ .

The elastically-upheld brace  $k$  supports the hinged bar  $E^x$  when the bed-bottom is extended, but yields when the hinges flex in rolling up the bed, the bail of support  $l$  "giving" backward.

The terminal sections of the end bar,  $E^x$ , are jointed to the ends of the side bars,  $E$ , by means of curved corner-pieces  $E'$ , as seen in Fig. 15.

When the bed-bottom is collapsed or extended, there will be a similar amount of extension and contraction of the end bar,  $E^x$ , of the top frame. To provide for this I make the joint in the said bar, where it crosses space  $X$ , a sliding joint, as illustrated in the detached fragmentary section Fig. 10<sup>a</sup>. In this case the hinge-plate  $j$  has elongated riveting-studs, which pass through a slot,  $j^2$ , in plate  $i^x$  and are riveted down on a keeper-plate,  $j^3$ . Thus, when the bed-bottom is collapsed or extended, section  $i^x$  may slide on said hinge-plate by reason of said slot.

In Fig. 15 I have represented most of the springs  $B$  merely by circles in order to avoid obscuring other parts below.

I am fully aware that the top frames of bed-bottoms have had their end rails hinged at the middle so as to permit one-half of the bed to fold over on the other half, and that in some cases the end rails have had slide-joints to permit of collapsing the bed. These features I do not claim, broadly. My end rail is, hinged

at intervals to allow the bed to be rolled up, the slats on which the springs rest being connected by hinging-links.

Having thus described my invention, I claim—

1. A roll-up spring-bed consisting of spring supporting-slats, all permanently connected together, coil-springs mounted on said slats and connected together at their tops, and a continuous top frame mounted on the tops of the marginal springs all around, the end bars of said top frame consisting each of short sections hinged permanently together at and between all the rows of springs, the hinges being arranged to flex or fold successively in opposite directions, as set forth.

2. The hinging-plate D, having attaching-studs  $d$ , for riveting the plate to the slat, a bar,  $\bar{d}$ , an inclined overhanging surface,  $\bar{d}^x$ , and a curved prong,  $\bar{d}^3$ , in combination with the slat and the flat link, the latter having a hole in its end to engage the prong  $\bar{d}^3$ , substantially as set forth.

3. The combination, with the slats arranged parallel and connected by hinged distancing-links, of the springs mounted thereon in the order shown and the end bars of the top frame made up of short sections hinged together at the alternate slats, and also between each row of springs, substantially as set forth.

4. The combination, with the slats arranged parallel of the coil-springs mounted thereon in the order shown, the jointed and hinged end bar of the top frame, supported on the coil-springs at the ends of the rows on alternate slats, the springs  $l$  on the intermediate slats, and the braces  $k$ , connecting said springs, respectively, with said jointed end bar and supporting same at the joints, said braces being hinged at their ends to said springs and end bar, as set forth.

5. The combination, with the two adjacent slats of a spring bed-bottom to form a collapsing hinge, of the link  $C^x$ , hinged at one end to one slat and at the other end to slide  $e$ , the said slide  $e$  mounted in a slideway on the other slat extending longitudinally thereof, and the short link  $C^{xx}$ , hinged to the slat having the slideway at its one end and to the link  $C^x$  at its other end, said hinges permitting the bed-bottom to be rolled up by the play of the links on their hinging-prongs, substantially as set forth.

6. The combination, with the slats  $A^x$  and  $A^{xx}$  and the hinge-plates D, mounted on same, of the links  $C^x$  and  $C^{xx}$ , hinged to the curved prongs of said hinge-plates, respectively, and pivotally connected at  $x$ , and the slide  $e$ , mounted in a longitudinal slot,  $e'$ , in the slat  $A^{xx}$ , the link  $C^x$  being hinged to said slide  $e$ , substantially as set forth.

7. The combination, with two adjacent parallel slats of a spring bed bottom, of collapsing hinges connecting the same, the springs mounted on said slats in alternating order, as shown, the eyes  $b^x$ , mounted on the outer or non-adjacent sides of said springs, and a con-

tinuous flexible lacing-cord,  $b'$ , threaded through said eyes and extending in a zigzag manner over said springs, substantially as set forth.

8. The combination, with the slats and springs of a spring-bed, and the side bar, E, mounted on the marginal springs, of the brace  $g$ , hinged at its upper end to said bar and at its foot to the torsional spring-support  $h$ , and the said spring-support constructed and mounted on a slat, substantially as set forth.

9. The combination, with the slat, of the spring-support  $l$ , mounted on the slat and comprising the coils  $l^x$ , and a long upwardly-projecting bail, the brace  $k$ , of flat metal, hinged at its lower end to the top of said bail and secured at its upper end to the sections  $i'$  of the end bar of the top frame, and the hinged sections of which said end bar is composed, the said bail and said brace  $k$  forming an angle with each other, or knuckle, where they are connected, whereby, when the end bar is depressed in rolling up the bed, said bail will be pressed inward or from the margin of the bed.

10. The combination, with the marginal springs at the ends of the bed-bottoms, of the sections  $i$ , secured to the tops of said springs, the sections  $i^x$ , hinged to the ends of sections  $i$ , the short sections  $i'$ , hinged to the adjacent ends of sections  $i^x$ , and the hinging-plates  $j$  and  $j^x$ , said sections and hinges forming the end bar,  $E^x$ , substantially as described.

11. The end bar,  $E^x$ , constructed of sections  $i$   $i^x$   $i'$ , hinged together in the manner set forth, and the hinge-plate  $j$  on one of said sections,  $i^x$ , mounted in a slide-bearing, substantially as set forth.

12. The combination, with the slats arranged parallel, and the springs arranged in alternate order on adjacent slats, of the clips  $c$ , each having two eyes and secured rigidly to the top of the spring, as shown, and the stiff links  $c'$ , loosely linked to said clips  $c$  at their ends, and arranged in the following order, namely: a single zigzag row of independent links extending lengthwise of the slats between each row of springs, substantially as set forth.

13. The combination, with the side bar, E, and slats A of a spring-bed, of the main brace  $g$ , hinged at its upper end to the side bar and at its lower end to a torsion-spring support on the second slat, A, the said torsion-spring support  $h$  provided with a hinging bail, as shown, and the auxiliary brace  $g^x$ , hinged at its one end to the brace  $g$  and at its other end to the marginal slat A, whereby the said braces  $g$  and  $g^x$  are arranged to stand substantially at right angles with each other normally.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

FRANK M. JEFFERY.

Witnesses:

HENRY CONNETT,  
J. D. CAPLINGER.