(No Model.)

4 Sheets—Sheet 1.

A. F. PUREFOY.

SPRING BED BOTTOM.

No. 333,252. Patented Dec. 29, 1885.

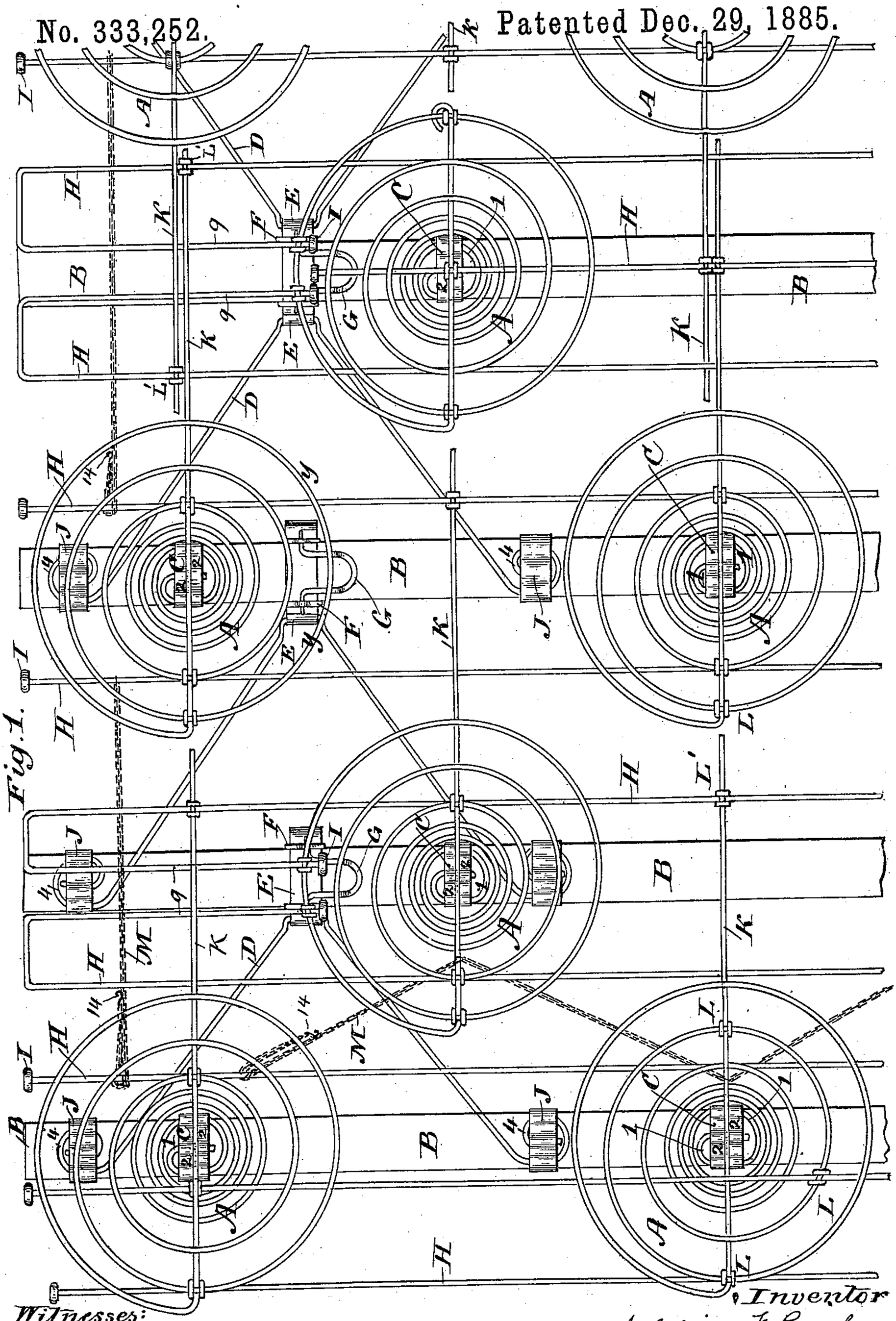


Fig. 1.

Witnesses:
L. C. Hills
E. E. Masson

Inventor
Addison F. Purefoy
by Chas. J. Hedrick
his attorney.

(No Model.) 4 Sheets—Sheet 2.

A. F. PUREFOY.

SPRING BED BOTTOM.

No. 333,252. Patented Dec. 29, 1885.

Fig. 2.

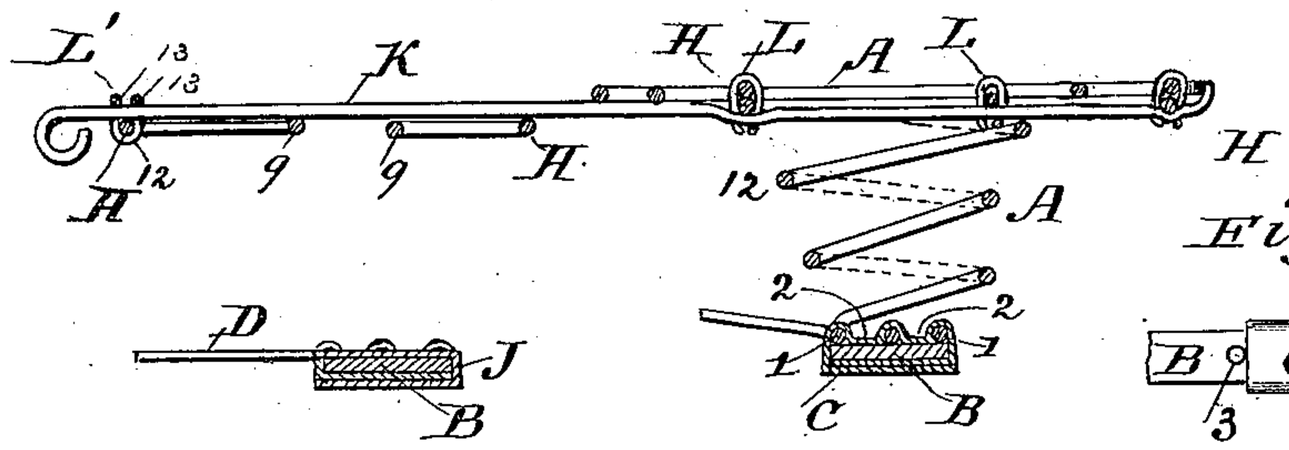


Fig. 3

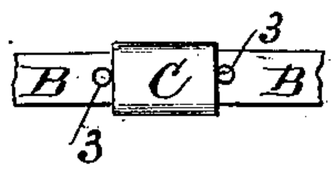


Fig. 4

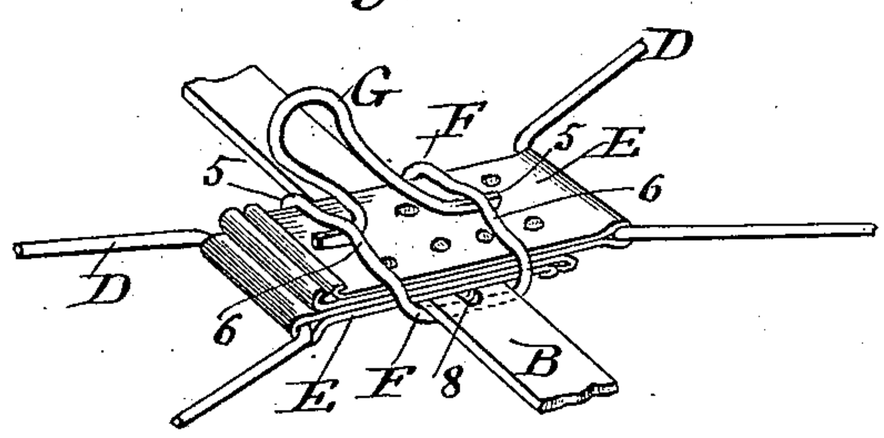


Fig. 5

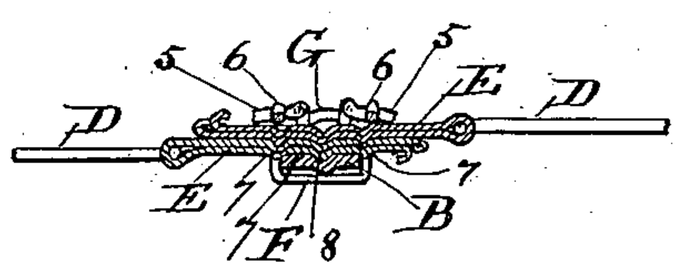


Fig. 6

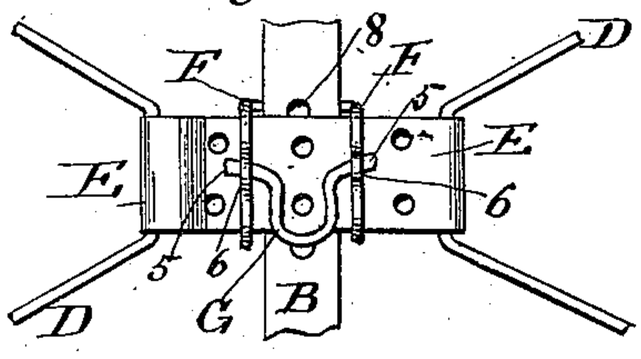


Fig. 7

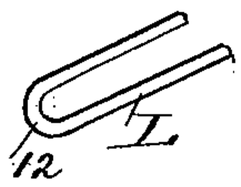


Fig. 8.

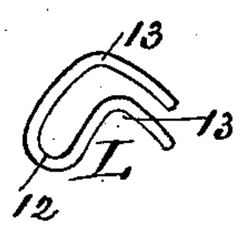


Fig. 9.

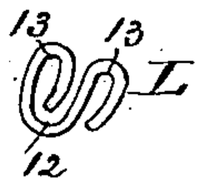


Fig. 10.

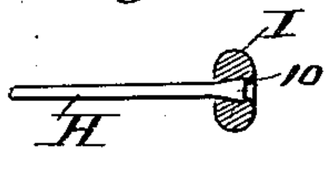
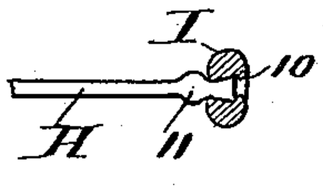


Fig. 11



Witnesses:
L. C. Hills
E. E. Masson

Inventor:
Addison F. Purefoy
by Chas. J. Hedrick
his attorney

(No Model.) 4 Sheets—Sheet 3.

A. F. PUREFOY.

SPRING BED BOTTOM.

No. 333,252. Patented Dec. 29, 1885.

Fig. 12.

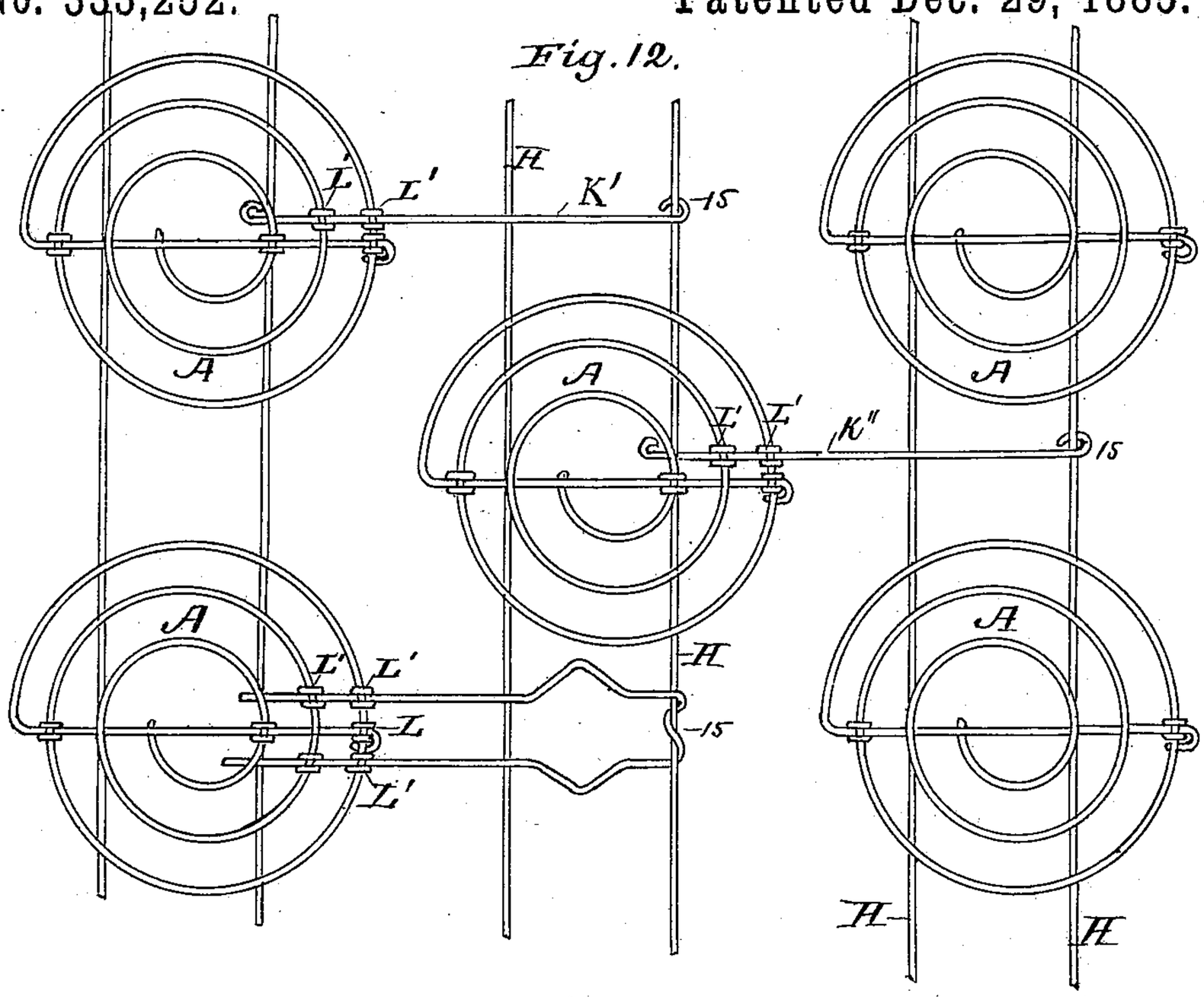
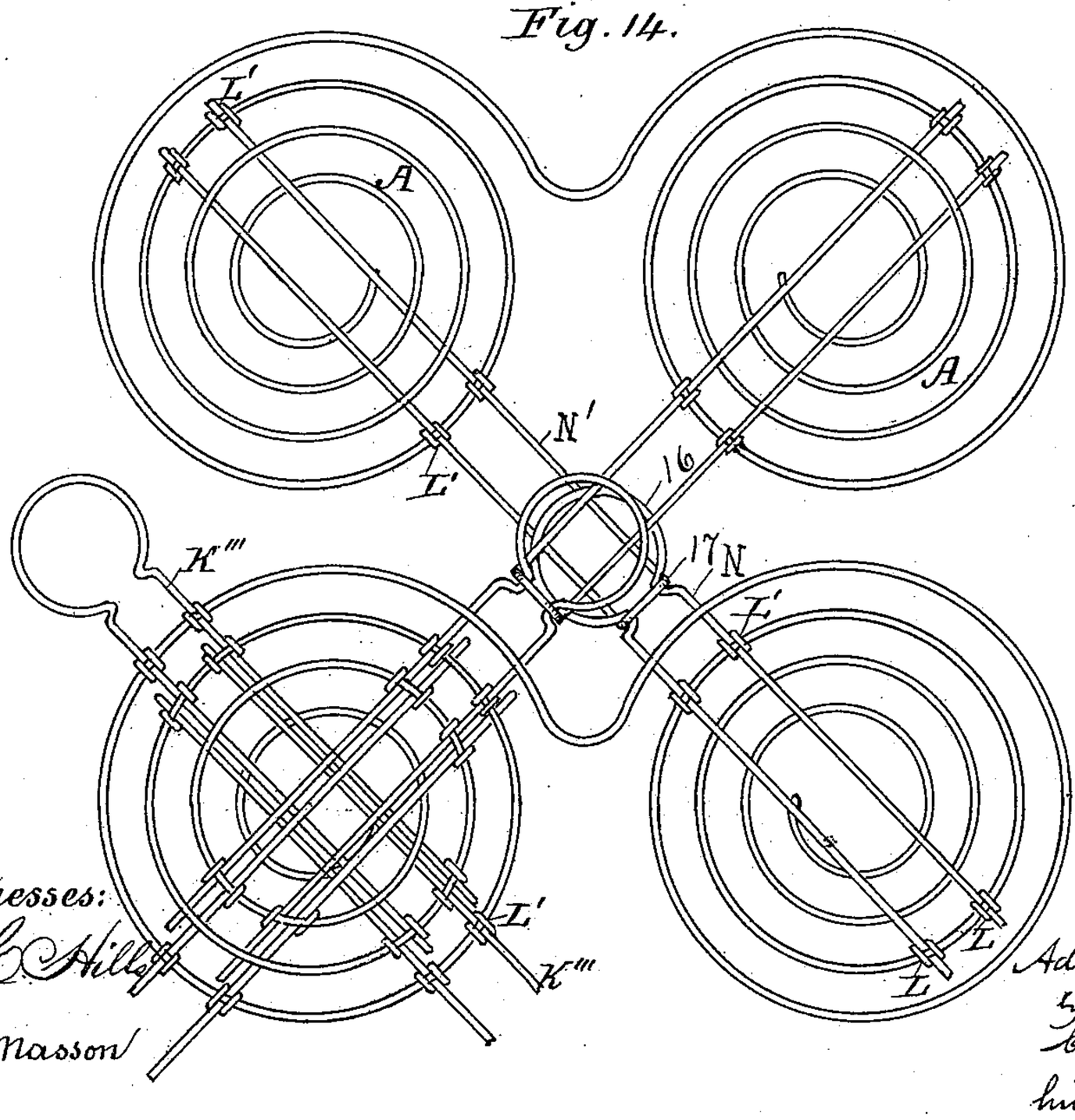


Fig. 14.



Witnesses:
L. H. C. Hills
E. E. Masson

Inventor:
Addison F. Purefoy
by Chas. J. Hedrick
his attorney

(No Model.) 4 Sheets—Sheet 4.

A. F. PUREFOY.

SPRING BED BOTTOM.

No. 333,252. Patented Dec. 29, 1885.

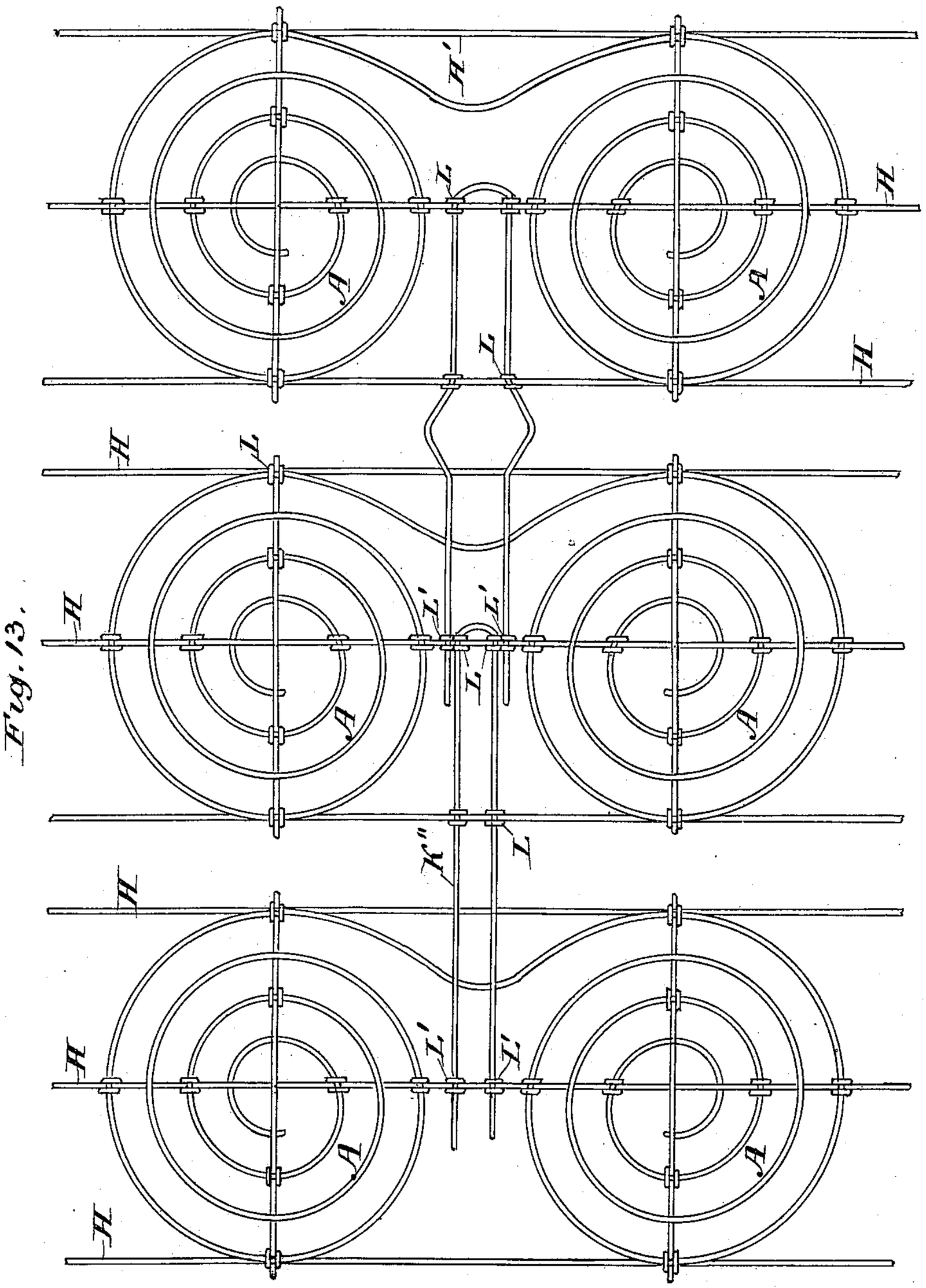


Fig. 13.

Witnesses:
L. C. Hills,
E. E. Masson

Inventor:
Addison F. Purefoy
by Chas J. Hedrick
his attorney

UNITED STATES PATENT OFFICE.

ADDISON F. PUREFOY, OF WAKE FOREST, NORTH CAROLINA.

SPRING BED-BOTTOM.

SPECIFICATION forming part of Letters Patent No. 333,252, dated December 29, 1885.

Application filed June 28, 1884. Serial No. 136,207. (No model.)

To all whom it may concern:

Be it known that I, ADDISON F. PUREFOY, a citizen of the United States, residing at Wake Forest, in the county of Wake and State of North Carolina, have invented certain new and useful Improvements in Spring Bed-Bottoms, of which the following is a full, clear, and exact description.

This invention, although not wholly limited thereto, relates more particularly to that class of spring bed-bottoms described in Letters Patent No. 279,013, granted to me June 5, 1883, in which springs provided with extension-tops are attached to a folding base adjustable in width. It may be considered as an improvement upon the bed-bottoms of that patent and my previous patents, No. 278,362, May 29, 1883, No. 261,954, August 1, 1882, and No. 254,372, February 28, 1882.

The object of the present invention is both to improve the construction of the bed-bottom, making it more comfortable, more durable or stronger, and more easily folded and adjusted, and to facilitate and cheapen the manufacture.

To this end or these ends the invention consists, mainly, in the following new devices or combinations:

First. Top braces formed of wires, rods, bars, or the like, which serve to give stiffness to the upper surface of the bed-bottom, and which extend in a direction across the axes of folding, connecting together the springs in adjacent rows, are so fastened to the springs or other parts that they do not interfere with the rolling up of the bed-bottom. The fastening is made by a slip-coupling, and when one row of springs is folded over onto another the braces slide in the couplings as the tops are brought together. Preferably these top braces are arranged at right angles to the axes of folding. Heretofore it was necessary to disconnect the top braces between the adjacent rows in order to roll up the bed; or, if the top braces remained attached, to disconnect the cross-pieces between the supporting-slats. The use, broadly, of wire top braces is, of course, not new.

Second. In connection with cross top braces fastened by slip-coupling, so as not to interfere with rolling up, longitudinal braces or strips formed of wires, bars, rods, or the like, and running parallel with the axes of folding, are used, they being fastened to the several springs in the corresponding longitudinal row. Preferably the top braces that cross the axes of folding at right angles are fastened at one or both ends to these longitudinal braces or strips.

Third. It is preferred to adopt in the arrangement of the springs the form of a quincunx, the springs of one row being opposite the spaces between the springs in the next row on either side, and in connection with springs so disposed the arrangement of longitudinal and cross top braces with the cross-braces fastened at one end to a spring and at the other to the longitudinal braces between two springs is most advantageous. This combination of the springs arranged as a quincunx, with the longitudinal and cross top braces connected with one another, as just stated, forms a special feature of invention. It is to be observed that the quincunx arrangement is not new even in a folding bed-bottom; but in those heretofore devised there have been no wire top braces, or at least none arranged as stated.

Fourth. Another improvement in connection with a bed-bottom having the springs arranged in the form of a quincunx is to have the longitudinal top braces bent at the ends, so as to form a loop for upholding the bedding between the springs in the end rows.

Fifth. Top braces for connecting different springs together are formed integral with a spring by bending the end of the spring-wire diametrically across and under the top coil or coils and allowing the end to project a sufficient distance beyond the same on the opposite side. The projecting end serves as the medium of connection with other springs.

Sixth. A new coupling for fastening together the spring-wires and brace-wires at their crossings is formed of a bent staple of heavy wire—that is, of wire sufficiently heavy to retain its shape or set when bent. The coupling is applied by slipping the staple over one wire and then bending the two ends of the staple around the second wire, which is laid across. Thus the second wire is encircled by the two eyes made from the legs of the staple, and the first wire is confined between it and the original bend of the staple. The wires are fastened tightly together to prevent slip-

ping or are loosely joined to allow one to slide in the coupling by closing the staples more or less on the wires, as may be desired in the particular case.

Seventh. The braces or other wires are provided at the end with a bead of metal or other material, which is secured thereon by flattening the end of the wire after it has been inserted through a perforation in the bead.

Eighth. The springs are fastened each at the foot to the base-piece by a strip or strips, that encircles both the base-piece and the foot or bottom coil of the spring, and is depressed into the space between the bends in the spring-wire. The same fasteners are or may be used permanently to secure braces or connectors to the base-pieces. In the folding base the joints are formed in these braces or connectors. Heretofore a fastener for conical springs has been made of band-iron, the ends being bent to form eyes, in which the spring-wire is introduced, said fastener being either secured to a slat by a screw or being interlocked with a similar fastener at the end of a second spring. These fasteners are, however, essentially different from those embodying the present improvement, and are not included by it, since they do not encircle the parts to be secured together.

Ninth. The fasteners which are used to make the connectors adjustable on the base-pieces are provided each with a lever or latch having cam-lugs that fit under loops. In one position of the lever (when the outer end is raised) the connectors are sufficiently loose to be adjusted, but on turning the lever down the cam-lugs press the ends of the connectors against the base-pieces and clamp or bend the same firmly.

Tenth. To prevent the connectors slipping at the clamp-fasteners when the levers have been turned down to clamp the same, one or more projections are provided on the top or bottom of the connector or brace, and then fit into corresponding holes in the base-piece or in another connector above or below the same. The projections are forced into said holes and retained therein by the fasteners.

Eleventh. Projections on the base-piece at the side of the fasteners specified under the seventh head are used to prevent the springs or the connectors moving lengthwise of the base-pieces.

Twelfth. Jointed connectors for the base-pieces are formed of wire bent upon itself and fastened at the two ends to a base-piece and a tongue hinged to the middle of the wire and fastened to the adjacent base-piece, the wire itself forming the pintle of the hinge.

Thirteenth. Chains are used in combination with the springs, the folding base, and the top slip-braces to hold the springs together when the bed-bottom is unrolled and prevent it from spreading and the top braces from slipping out. The chains are made adjustable, to allow the bed-bottom to be adjusted in width. The use of chains adjustable in length for connecting the springs in bed folding bottoms is broadly not claimed, this having been done heretofore.

Fourteenth. The bed-bottom is or may be made up of two grades of springs—heavier ones at the head and middle of the bed and lighter ones at the foot and between the head and center. The advantage of this is in diminishing the pressure upon the tender parts of the body—to wit, the sides and middle of the back—and also in making the bed-bottom lighter and cheaper.

The new improvements are all designed to be used in one and the same bed-bottom, each co-operating with the other; but it is intended to claim them where new as well separately as in combination with one another.

The invention also comprises certain special constructions and combinations of parts as hereinafter set forth.

Having explained the principle of the invention, what is considered the best mode of applying that principle will now be described with the aid of the accompanying drawings, which illustrate a bed-bottom constructed in accordance with the invention, together with some modifications also within the invention.

Figure 1 is a plan of a portion of the bed-bottom, and Fig. 2 a vertical section alongside of one of the cross-braces, K; Figs. 3 to 11, detail views; Figs. 12, 13, and 14, views in plan of portions of a bed-bottom, illustrating three modified arrangements of the top braces.

Fig. 1 exhibits more than half of the bed-bottom in width and more than one-fourth in length, sufficient to illustrate the construction, the parts omitted being simply duplicates of those shown. The springs A are fastened at the foot to the base-pieces B, (in the form of hoop-iron strips or other suitable form,) which run lengthwise of the bed-bottom. They are secured to the base-pieces by the fasteners C in the form of metal strips extending over the foot-coil and under the base-piece, and bent down at 2, between the wires 1 of the foot-coil. In applying the fastener the ends are overlapped and soldered, welded, or cast, (if malleable cast-iron be used,) or otherwise fastened together. The band thus formed is slipped over the base-piece and foot-coil, and then the fastener is bent down by a suitable tool between the wires 1. The effect is to hold the spring very firmly to the base-piece and to prevent any movement, unless the fastener slips on the base-piece. To prevent this, projections 3 are or may be thrown out or formed on the top or bottom of the base-piece by punching or other suitable means, and the fastener is placed between them. (See Fig. 3.) The V-shaped member D of the jointed connectors between the base-pieces is provided at the ends with coils 4, which are permanently fastened to the base piece by fasteners J in all substantial respects as the springs A are by the fasteners C. In both the coils 1 and 4, as shown, the end of the wire is bent

across the middle, and there are two depressions in the fastener, one on each side of said wire; but the shape of the coil, (whether round, square, or other shape, and whether with or without the cross-wire,) the number of depressions, (whether one or two, or more,) and the number and shape of the metal strips composing the fasteners are not material. The particular construction shown is the best, and may be considered as a special part of the invention. The V-shaped member D of a connector is made of wire or hoop-iron, and to it the tongue E is secured by bending it around the middle of the wire, which thus forms the pintle of the hinge. The fasteners for adjustably securing the tongue to the base-piece comprise the tie F, preferably of wire or of malleable cast-iron, and the latch G. The latch has cam-lugs 5, which extend under the loops 6 of the tie F. The cam-lugs are formed by bending and flattening or by casting or by punching the ends of the latch, as clearly shown in Figs. 4 to 6. The tongue E is passed under the cam-lugs and loops 6 between them and the base-piece, the latch being turned up, as shown in Fig. 6. When the tongue is properly adjusted, the latch is turned down, pressing and holding the tongue against the base-piece. The connectors D E, on opposite sides of the middle of the bed-bottom, are arranged to project in opposite directions, and the tongue E of the two connectors are lapped on the middle base-piece, as shown in Fig. 1, and a single tie and latch holds them both.

In order to make a positive engagement between the connector-tongue and base-piece, so as not to rely solely upon friction to prevent the tongue from moving, projections 7 are or may be thrown out on the bottom of each tongue, and depressions 8 are formed in the base-piece. When the tongue has been adjusted, certain of the projections thereof enter the base-piece. On the middle base-piece where the tongues overlap the projections on the upper tongue enter depressions in the lower tongue, (formed by punching the latter to throw out the projections on the bottom.) The springs A are arranged upon the base formed by the slat-like base-piece and the connectors between the same in the form of a quincunx, the springs in each row being opposite the spaces in adjacent rows. The springs at the middle and head of the bed are made of heavier wire than those between the middle and head and at the foot. Thus in the ordinary length of bed there would be from head to foot nine transverse rows, of which three are partly represented in Fig. 1. The third row from the head and the three foot rows would be lighter than the first and second, fourth, fifth, and sixth rows. It is found that No. 10 (or No. 11) wire answers well for the heavy and No. 11 (or No. 12) for the light springs, although the particular sizes used are not material, provided there is a material difference in the elasticity of the different rows of springs. Braces or wires H extend lengthwise of the bed-bottom (parallel to the base-pieces) and are fastened to the tops of the springs which they cross. With extension-top springs they are preferably run under the coils of the extension tops, as shown. Any desired number of these wires or longitudinal top braces may be used, and they may be straight or bent into various shapes. As shown, the outer rows (see row at left of Fig. 1) and the middle row have three wires or braces, the other rows two only. The wires or braces on the intermediate or short rows, where they project beyond the last spring in the row, are bent back on themselves, as shown at 9, in order to support the mattress or bedding at those points. All the wires or braces are or may be provided with an end finish, I, in order to protect the end. This finish consists of a bead preferably of metal, although wood or other material may be used, which bead is secured on the extremity of the wire or brace. The brace-wire is introduced through the hole in the bead. The end is then flattened and spread, as shown at 10, Figs. 10 and 11, and is drawn back into the bead, the hole in which is enlarged at the outside, so as to receive it. The spreading of the wire prevents the bead drawing off. The bead is prevented from slipping back on the wire or brace by compressing or by spreading the wire inside the bead, as shown at 11, Fig. 11, or by other suitable means. The cross top braces K are formed integral with the springs and constitute extensions of the spring-wire, which has been bent diametrically across and under the extension top of the spring, and then allowed to project in the same direction a suitable distance. These cross top braces, as shown, overlie the nearest longitudinal top brace, and also the succeeding one, to which they are fastened. The top braces are all fastened to the springs by the same kind of coupling, L or L′. A staple (see Fig. 7) is bent into the condition shown in Fig. 8. One of the wires (that which goes under the wire or wires to be coupled together) is laid in the original bend or eye, 12, of the staple. The two legs of the staple are placed over the upper wire, so that it rests in the bends 13. The legs of the staple are now bent around and closed upon the wires. (See Fig. 9; also Figs. 1 and 2.) The degree of force used in closing the staple around the wire determines whether the coupling shall hold the brace firmly, so as to prevent independent movement, or shall permit one to slide on the other.

For the sake of distinction, the tight couplings are lettered L. The loose or slip couplings are lettered L′. No. 16 or No. 17 wire is preferably used for the staples.

In order to prevent the tops of the springs from spreading or getting out of their proper relative position, chains M are run between the springs. These chains may connect one spring with another, as shown at the top of Fig. 1; or they may run zigzag between a series of springs, as shown at the left of the figure.

These chains have hooks 14, so that their length can be regulated.

In folding or rolling up the bed-bottom the jointed connectors D E bend and the tops of the springs come together. Owing to the quincunx arrangement, the extension tops enter the space between the adjacent springs. The chains and longitudinal top braces do not, of course, affect the folding. The cross-braces slip and turn in their couplings L′, so that they oppose little resistance to the folding, and this slight resistance is offset by the yielding of the said braces and springs.

Instead of making the cross top braces integral with the springs, they may be made to slide in the couplings which attach them to the springs. This modification is shown in Fig. 12. The cross-braces K′ are connected with the longitudinal top brace, H, by an eye, 15, at the end of the cross-brace inclosing the longitudinal brace-wire, and the brace slips in the couplings L′ on the springs A when the bed-bottom is folded. With springs arranged in strictly parallel lines, the springs in one row opposite the springs in adjacent rows, and not opposite the spaces therein, the modification shown in Fig. 13 is adopted. In this case the cross-braces K″ are fixed by couplings L to the longitudinal braces H of one row, and connected by the couplings L′ with the longitudinal braces H of the next row.

In Fig. 14 an arrangement of diagonal braces, N N′, is represented. Each brace is fastened by slip couplings L′ to the extension top or coils of a spring, A. The braces N have enlargements or heads 16, and are provided with notches 17 just inside the same. The ends of braces N′ are each passed over the head 16 of a brace, N, and held by the notches 17, which keep the braces in line.

Having now fully described the invention and the manner of carrying the same into effect, I would observe that I do not confine myself to the particular details described, which are given by way of example, and not as limiting the invention strictly thereto; but

I do claim the new improvements herein described, all and several, to wit:

1. The combination, with the folding base, composed of the base-piece and hinge-connectors, and the springs carried by said base, of the top braces composed of stiff wire, rods, or the like extending across the axes of folding, said braces being coupled and arranged, substantially as described, so that the bed-bottom may be rolled or folded together without disconnecting them, substantially as described.

2. The combination, with the folding base and the springs carried thereby, of the longitudinal top braces and the cross top braces extending across the axes of folding and coupled to said longitudinal braces by means of slip-coupling, substantially as described.

3. The combination, with the springs arranged after the manner of a quincunx, of the longitudinal and the cross top braces, said cross-braces being fastened at one end to the springs and at the other to the longitudinal braces between the springs in the adjacent row, substantially as described.

4. In combination with the springs arranged after the manner of a quincunx, the longitudinal top braces fastened to the springs and bent upon themselves at the end to give an enlarged support to the bedding between the springs of the end row, substantially as described.

5. In a spring bed-bottom, the top braces formed integral with the springs, and consisting each of the wire composing the spring bent diametrically across and under the top coil or coils of the spring and projecting beyond the same for attachment to other parts of the bed-bottom, substantially as described.

6. In a spring bed-bottom having top braces combined with the springs and in combination with the crossed wires, the couplings L or L′ at the crossings, said couplings being formed each of a staple of heavy wire bent as explained, one wire lying in the original eye 12 of the staple and another in the bends 13 in the legs of the staple, substantially as described.

7. In a spring bed-bottom, and in combination with the springs thereof, top braces of wire provided at the ends with beads held thereon by spreading the end of the wire, substantially as described.

8. In combination with the springs and their supports or base-pieces, the fasteners for attaching the springs to said base-pieces, said fasteners comprising metal strips encircling each the foot-coil of a spring and the base-piece and bent down between the wires of said coil, substantially as described.

9. The combination, with the base-pieces and the connectors, of the fasteners composed of strips encircling the ends of the connectors and the base-pieces and bent down into the openings in the ends of said connectors, substantially as described.

10. The combination of the base-pieces and the fasteners for attaching the connectors or springs to the base-piece, said fasteners being composed of metal strips encircling the base-piece, and a coil on the connector or spring, and bent down into the opening in said coil, and said base-pieces having projections to prevent the fasteners slipping, substantially as described.

11. The combination, with the base-piece and connectors, of the adjustable fasteners comprising the ties and their latches having cam-lugs fitting under loops of said ties, substantially as described.

12. The combination, with the base-pieces and the connectors provided, respectively, with projections and depressions adapted to engage one with the other, of the ties and the latches having cam-lugs fitting under loops in said ties, substantially as described.

13. In combination with the base-pieces, and the springs carried thereby, the jointed connectors attached to said base independ-

ently of said springs, and comprising each a member of wire and a tongue hinged to said wire, which itself forms the pintle to the hinge, substantially as described.

14. The combination, with the springs, the folding base, and the top slip braces, of the chains for keeping the top of the springs in their proper relative positions and preventing the top brace from slipping out, substantially as described.

15. In a spring bed-bottom, springs of different degrees of elasticity arranged in rows, the transverse rows at the head and middle of the bed-bottom being of stiffer wire than those at the foot and intermediate parts of the same, substantially as described.

16. The combination of the springs arranged after the manner of a quincunx, the folding base, the longitudinal and the cross top braces, and the slip-couplings, substantially as described.

17. The combination of the base-pieces, the hinge-connectors, the permanent and the adjustable fasteners for attaching the ends of said connectors to the base-pieces, the extension top springs, the fasteners for securing them to the base-pieces, the longitudinal and the cross top braces, and the slip-couplings, substantially as described.

ADDISON F. PUREFOY.

Witnesses:
EDWIN C. DOW,
JOHN C. GALLAGHER.