(No Model.) 2 Sheets—Sheet 1.

W. L. PHILLIPS.

BED BOTTOM.

No. 381,948. Patented May 1, 1888.

Fig. 1.

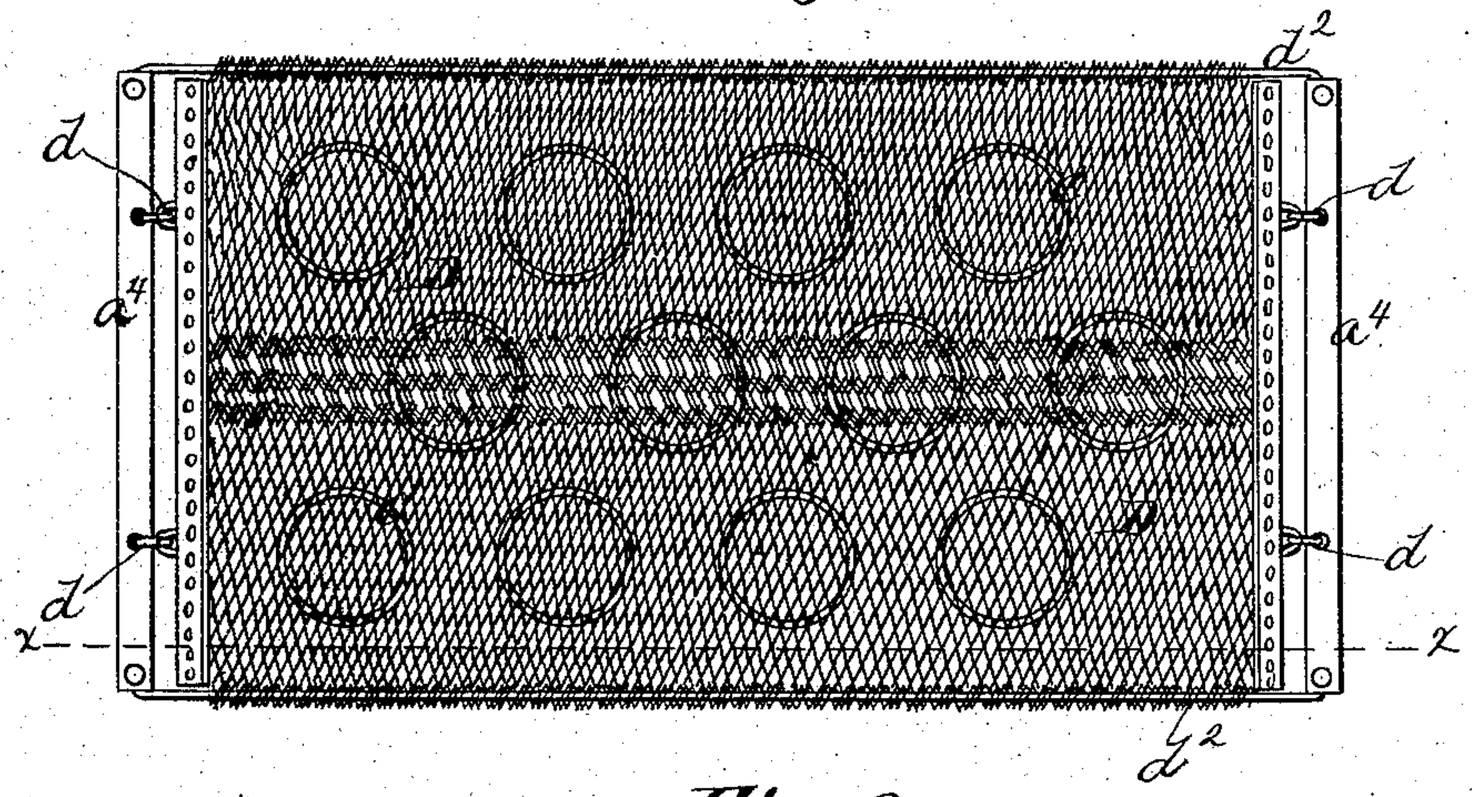


Fig. 2.

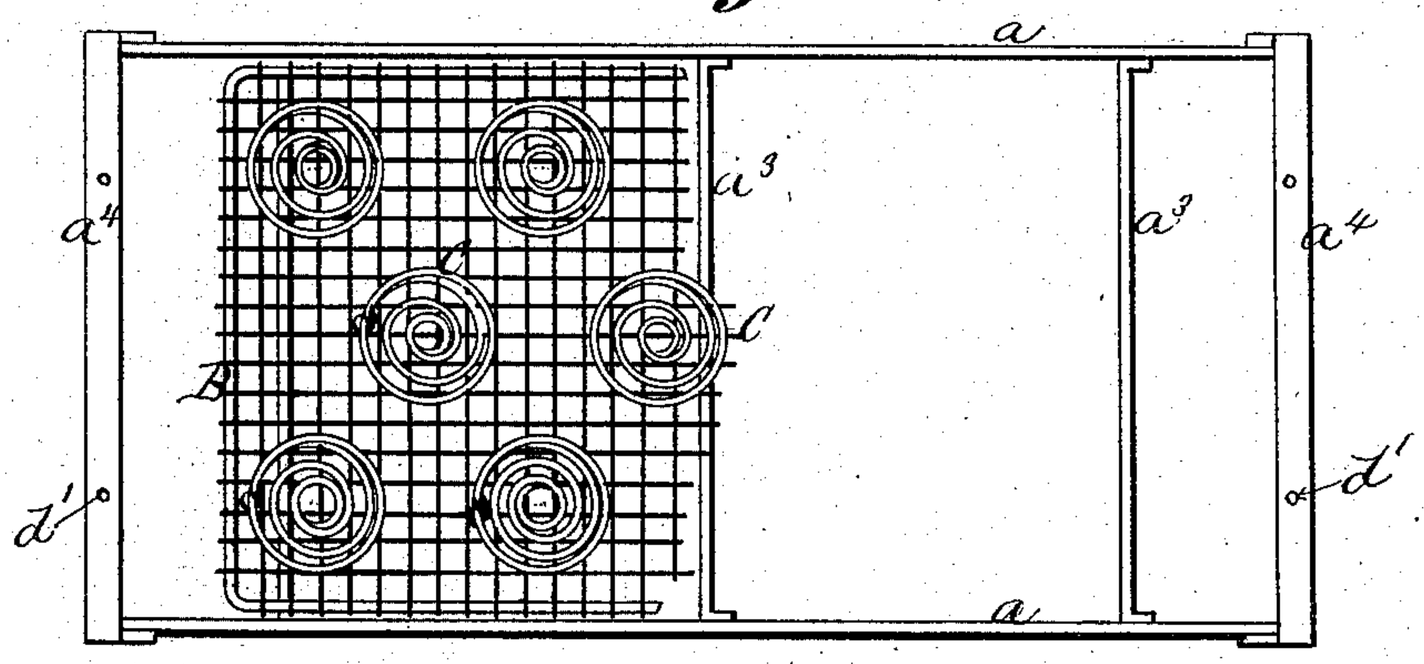
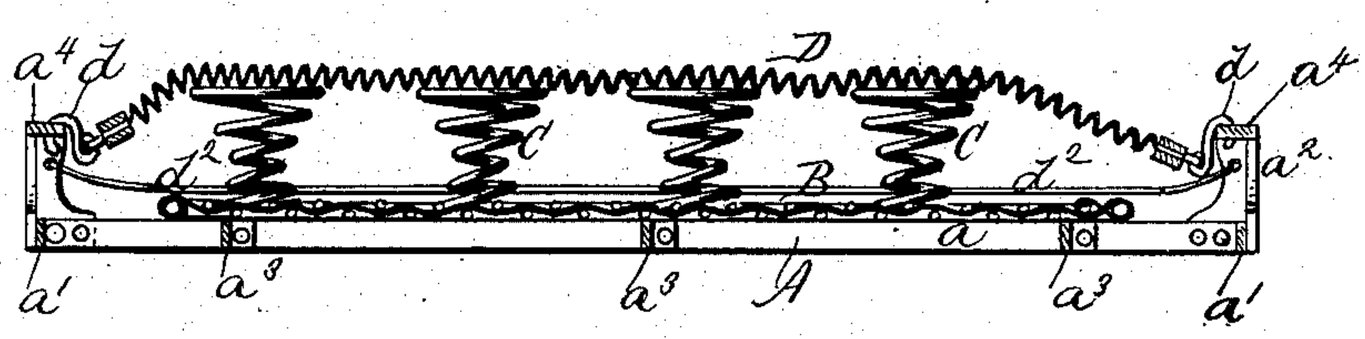


Fig. 3.



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By his Attorney
Leo. H. Mott

(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

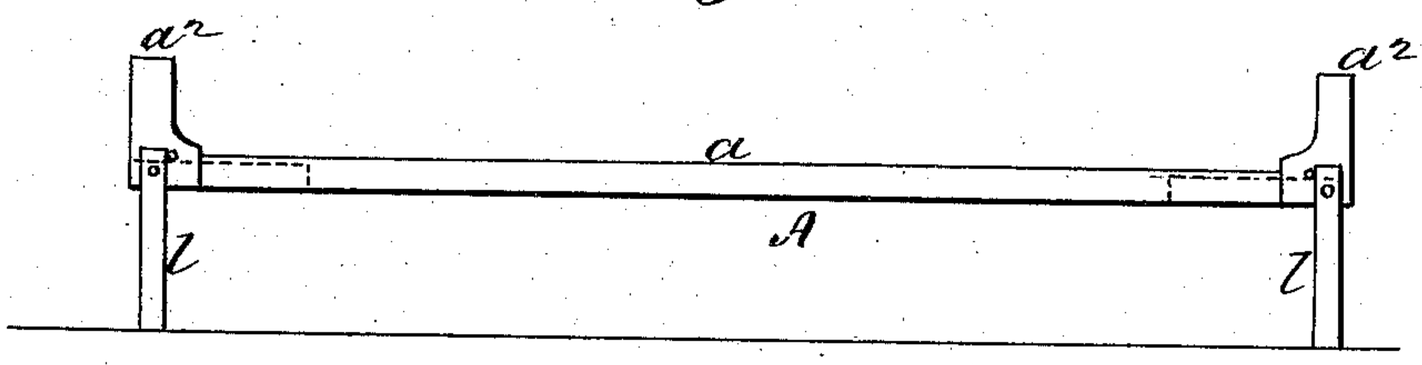
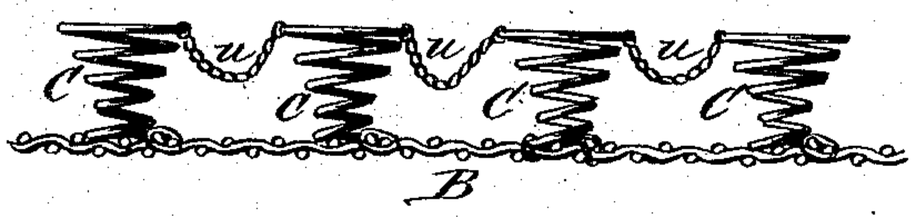


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM L. PHILLIPS, OF BROOKLYN, NEW YORK, ASSIGNOR TO CHARLES F. PHILLIPS, OF SAME PLACE.

BED-BOTTOM.

SPECIFICATION forming part of Letters Patent No. 381,948, dated May 1, 1888.

Application filed June 28, 1886. Serial No. 206,387. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. PHILLIPS, a citizen of the United States, residing in the city of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Spring Bed-Bottoms, of which the following is a full, clear, and exact description, sufficient to enable others skilled in the art to which the invention appertains to make and use the same.

My improvements relate to the class of bed-bottoms in which spiral springs are used, and are designed to produce a highly-sensitive elastic support or receiving-surface which will be free to adapt itself at all points to the weight and inequalities of the body resting upon it. This may be accomplished largely by the use of spiral springs alone, as in my Patent No. 258,595, in which the lower ends of the springs are attached to a woven-wire base, while their upper ends are free and independent and at liberty to adapt themselves individually to the variations in pressure; but while my form of bed-bottom referred to affords an effective device in view of the simplicity and cheapness of its construction, still a comparatively-large number of springs have to be used in order to reduce the spaces between adjoining springs to the minimum, otherwise the support afforded would be uneven and uncomfortable. To obviate the necessity for the use of so many springs, and at the same time insure a more perfect uniformity in the elastic resistance afforded by the bearing or receiving surface as a whole, a leading feature of my invention consists in combining, with a series of spiral springs supported upon a woven-wire or other suitable base a covering or mat which rests loosely over and upon the top of the springs, but has no direct or positive connection therewith, so that both the mat and the springs are free to adapt themselves independently to the pressure or strain exerted from above. The mat, by bridging over the spaces between the springs, extends the area of their influence without causing them in any case to pull one upon another or interfere with each other, as would be the case if they were positively and tightly coupled together, as has been customary heretofore in ordinary spring bed-bottoms. Since I design to use a suitable material for the mat, a sheet of twisted woven wire—such as that which is known as "woven-wire cloth"—or an equivalent material having inherent elastic or mat-like qualities, (although I do not limit myself to any special covering material in this connection,) I attain a much more sensitive and delicate, but evenly-distributed support than heretofore, which renders a thick mattress or other heavy cushion above unnecessary, a simple covering of comparatively-slight thickness being sufficient to afford a comfortable bed, which, in its ready adaptation to the form and convenience of the user, approximates, as nearly as is possible by mechanical means, the desideratum of a perfectly-elastic medium of sufficient density upon which the body may be said to float.

I am well aware that bed-bottoms have been made wholly of woven-wire cloth suspended tightly or rigidly upon a suitable frame, and, also, that such woven-wire cloth has been reenforced by spiral springs placed underneath to counteract the tendency of the cloth to sag in use; but such constructions are not the equivalents of my combination of a series of spiral springs with a loose covering or mat, which acts as a mattress to receive and distribute the strain evenly to the springs. I expressly disclaim and discard all means of fastening or suspending the mat or mattress that would cause such fastenings to assume any of the weight or strain, the links or connections herein shown as connecting it with the frame having sufficient looseness and play to allow the mat to adapt itself to all conditions of use, and being used simply and only for the purpose of preventing the displacement of the mat bodily.

A leading distinction between my construction and others heretofore used, in which a wire or cloth has been suspended from the frame, is that in every such case the suspended cloth in use becomes virtually a hammock to a greater or less degree, in which the head and feet are unduly elevated above the rest of the body, the mere fact of suspension alone preventing the cloth, no matter how elastic, from adapting itself perfectly to the inequalities or requirements of the body, whereas by my construction hammocking or sagging is entirely obviated, the spiral springs affording practically the entire support.

My invention also includes certain features in the construction and combination of parts, hereinafter set forth.

As before intimated, by my construction I am enabled to materially reduce the thickness of or even dispense with the use of the ordinary mattress, affording a cool, healthy bed, while augmenting its softness and comfort. Constructed substantially as herein shown and described, it is especially desirable for use in hospitals, warm climates, &c., and the facility with which it can be taken apart or rearranged is practically an important advantage.

In the accompanying drawings, Figure 1 is a top view of my improved bed-bottom; Fig. 2, a similar view with the mat or cover removed, and with one-half of the woven-wire base and springs omitted to more clearly show the frame-work. Fig. 3 is a vertical longitudinal section upon plane of line *x x*, Fig. 1. Fig. 4 is a side elevation of the rigid supporting-frame provided with folding legs to adapt the bed-bottom for use as a cot, the legs being shown as folded parallel to the frame in dotted lines; Fig. 5, a view illustrating the connection of the tops of the spiral spring by means of loose chain-couplings adapted to permit of a sufficient freedom or independence of motion between the springs individually.

The frame-work A is preferably made of metal, although other material may be used if desired, its office being to afford a suitable means of support for the base B, upon which the spiral springs C are mounted, and also to afford a convenient means for coupling and retaining the ends of the cover or mat D loosely in place. This frame A may be formed either to fit into any ordinary bedstead or it may itself be made to constitute the bedstead, and by the provision of suitable folding or temporary legs, *l l*, as indicated in Fig. 4, or other end supports, the bed-bottom may be adapted for use as a hospital or other cot bed.

As shown in the drawings, the frame A is formed of the longitudinal side bars, *a a*, and end bars, *a' a'*, the extremities of which are screwed or bolted to the corner-pieces a^2 a^2. Suitable transverse bars, a^3 a^3 a^3, are also secured between the longitudinal side bars, *a a*, for the purpose of affording proper support for the base B. It is obvious that these bars a^3 a^3 may be arranged in the frame longitudinally, or otherwise, if preferred, with like effect, or their equivalent may be substituted in the form of brackets or lateral projections from the side bars, *a a*, sufficient to afford adequate support for the base B.

The springs C may be mounted upon any suitable base, B; but I prefer to use the woven-wire base described in my Patent No. 258,595, in which the woven wire is secured to a rigid metallic frame. The upper ends of the springs are preferably free and unconnected with each other, and are covered by a loose mat or cloth of any suitable or desired material, the essential feature in this connection being the use of a loose covering which is free to adapt itself to all the circumstances of use without interfering with or controlling the action of the springs, excepting only in so far as it extends their area of influence. It is obvious that, if desired, the tops of the spiral springs may be loosely coupled together as heretofore for the purpose of preventing undue separation without deviating from my invention, but in such case the form of connection must be sufficiently loose or elastic to allow each spring to act independently. This construction is illustrated in Fig. 5, in which it will be seen that the loose couplings or chains *u u* are of sufficient length to afford the spiral springs C ample lateral motion individually.

Although a simple covering of fibrous or textile material of suitable thickness may be used as the mat D, I prefer to use a covering of so-called "woven wire" on account of its inherent elasticity and great strength and durability. As before said, the mat D, of whatsoever material formed, rests loosely upon the tops of the springs C; but to prevent its accidental displacement bodily and to preserve the proper relation of parts I couple its extremities to the frame A by loose couplings *d d*, which may consist, as shown, of hooks engaging with eyes *d' d'*, formed in the frame, although it is obvious that other forms of loose couplings may be used. To accomplish this conveniently, I extend the corner-pieces a^2 a^2 upward above the side and end bars *a a'* sufficiently to afford a means of securing the elevated end bars, a^4 a^4, in which the holes *d' d'* are formed. Where the outer frame, A, is not used, the loose cover may be coupled in any suitable manner to the base B, since it is obvious that the latter itself may be thus used independent of the outer frame, A, without deviating from the spirit of my invention, which embodies, essentially, the combination, with a series of spiral springs mounted upon any suitable base, of a loose covering or mat for the springs, substantially as herein designated.

When the woven-wire fabric is used as the mat D, I also use in some cases loose guard-wires d^2 d^2 upon either side, which are connected with the edges of the fabric in any suitable manner and act as stiffeners, simply to prevent undue distortion or derangement laterally. These guard-wires d^2 when used are sufficiently long and slack to avoid interference with the free movement and adaptability of the mat D during use. The farther one of them is shown in Fig. 3, its encircling spiral being omitted, however. Both are shown in Fig. 1.

I am aware that woven-wire cloth has been used as a covering for spiral springs; but in all such cases the woven-wire cloth has been drawn taut and supported rigidly at the ends or sides, or both, whereas the whole gist of my invention in this respect consists in the use of a covering or mat which is practically un-

supported and unrestrained at the edges, so that it is free to conform to and to follow the depression of the springs in any direction, the couplings or links which connect it to the rigid frame being used simply to prevent the displacement of the cover, while allowing it all possible freedom of movement. Where the cover is rigidly suspended at the ends or sides, its greatest elasticity will invariably be at its center, so that such old form of covering will necessarily act more or less as a hammock during use, whereas I, for the first time in the art, produce in a bed-bottom a supporting-surface which is uniformly elastic or yielding and resilient throughout.

Having thus described a practical means of utilizing my invention, I desire to state that I do not confine myself strictly to the special construction of mat or covering shown; but

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A spring bed-bottom substantially such as herein designated, consisting of a series of spiral springs secured at their lower ends to a rigid base and having free lateral movement within proper limits at their upper ends, and a covering or mat resting loosely upon and supported by but not connected with the said springs, but held against displacement bodily by loose couplings or links which permit it to move freely and conform to pressure in all directions, for the purpose and substantially in the manner described.

2. A spring bed-bottom substantially such as described, consisting of a series of spiral springs secured at their lower ends to a rigid base and having free lateral movement within proper limits at their upper ends, and a covering or mat of woven-wire cloth, substantially such as described, resting loosely upon and supported by but not connected with the said springs, but held against displacement bodily by loose couplings or links which permit it to move freely and conform to pressure in all directions, for the purpose and substantially in the manner described.

3. In a spring bed-bottom substantially such as described, the combination, with the rigid woven-wire base B, the loosely-resting series of springs C, and cover or mat D, of the rigid frame A, formed with the supports *a a*, for the purpose and substantially in the manner described.

4. In a spring bed-bottom substantially such as described, the rigid frame A, formed of the side and end bars, *a a'*, united by corner-pieces a^2 a^2, formed with the supports a^3 a^3 and a^4 a^4, in combination with the base B, springs C, cover D, and couplings *d*, the whole arranged and operating substantially in the manner and for the purpose described.

WILLIAM L. PHILLIPS.

Witnesses:
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PAUL H. BATE.