

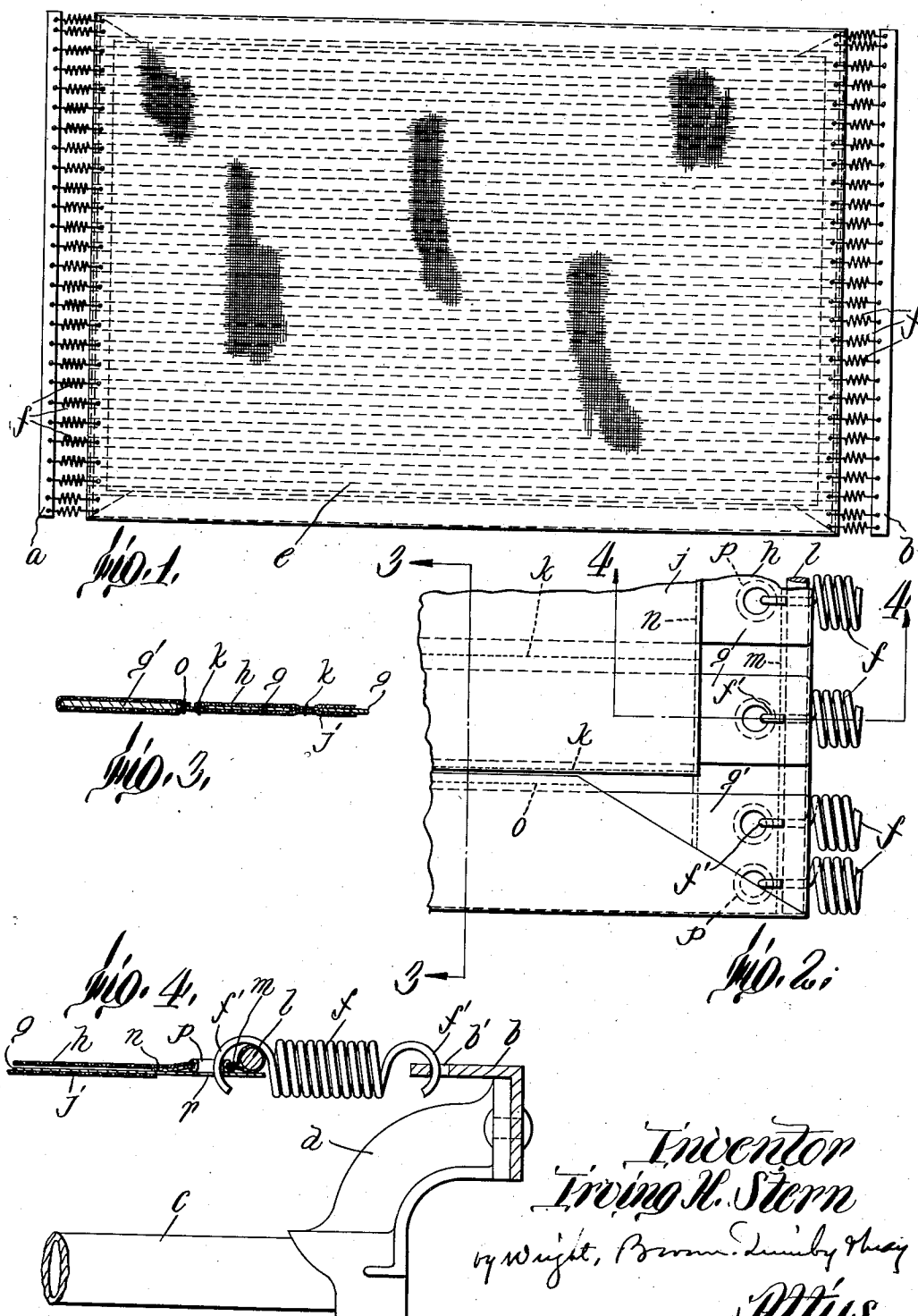
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BED BOTTOM

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BED BOTTOM

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2 Claims. (Cl. 5-186)

This invention relates to spring bottoms for beds, couches, chairs and the like. For convenience of description I will generally call it a bed bottom, this term having the usual significance in the art as meaning the part of the bed, couch, chair, or analogous article of furniture which supports the mattress or cushion on which the occupant lies or sits. Bed bottoms of a great variety have been made including the familiar box spring, so called, which includes rows of spiral springs, set with their axes upright, wire fabrics connected at opposite ends by horizontal helical springs to a frame, etc.

The present invention relates more particularly to that type of bed bottom which includes a generally flat structure connected at its ends to the supporting frame by horizontal helical springs. Its object is to provide a structure of this nature which will be sufficiently resilient and at the same time resistant to sagging in the middle, which is firm at the side edges and able to resist the sagging tendency caused by a person sitting on the edge of the bed; which presents an unbroken expanse of close woven fabric resistant to passage of dust for the protection of the overlying mattress or cushion; which has means to prevent the covering fabric from puckering and pulling away at the ends; and which can be manufactured at low cost and sold at a moderate price.

The manner in which these objects are accomplished and the principles of the invention are explained in connection with the following description of a specific embodiment of the invention which contains its preferred form.

In the drawing,—

Fig. 1 is a plan view of a resilient bed bottom containing the invention;

Fig. 2 is an under plan view of one corner of the bed bottom shown on a larger scale;

Fig. 3 is a cross section taken on line 3—3 of Fig. 2;

Fig. 4 is a longitudinal section taken on line 4—4 of Fig. 2.

Like reference characters designate the same parts wherever they occur in all the figures.

The structure in which the new features of the invention are embodied is supported at opposite ends by the end rails *a* and *b* of a supporting frame. These end rails may be connected together and held at a given distance apart, against the tension of the intermediate structure by side bars *c* and corner brackets *d*, of which one is shown in Fig. 4, like those of certain well known commercial types of bed spring, or by other suit-

able means. The invention involves nothing new in the supporting frame. Such side bars and corner brackets are omitted from Fig. 1 for clearness. The novelty of the invention resides in the intermediate structure, designated as a whole by the reference letter *e* in Fig. 1, which is connected with the end rails by helical springs *f*, *f*, and in the combination thereof with a supporting frame of any suitable character.

The intermediate structure above referred to, which may be called also the bottom fabric of the bed spring combination, consists of straps or bars *g*, *g'*, a top covering *h* of textile fabric, and a bottom covering sheet *j* also of textile fabric. The straps or bars *g*, *g'*, are of metal, preferably steel, having sufficient resilience, elasticity and stiffness to support the weight of a reclining human body without excessive sagging and to return to substantially straight condition after removal of the weight. Straps approximately 1" or 1¼" in width of 22 gauge metal with a spacing of from 1½" to 1¾" between center lines, have the qualities necessary to serve these purposes. The outermost straps *g'*, which lie at the side edges of the structure, are preferably made wider and thicker than the intermediate straps *g*, for instance 1½" wide and of 16 gauge thickness, in order to prevent the effect, which has been an objectionable feature of many bed springs heretofore put out, of becoming loose and sagging as the result of the user of the bed sitting on its edge. In furtherance of this object, two of the springs *f* are connected to each end of the outermost straps *g'*, while one spring only is connected to each end of the intermediate straps *g*. In other words, the outermost straps are supported and pulled upon with a stronger spring tension than the intermediate straps.

The covering sheets *h* and *j* are made of a suitably strong and closely woven textile fabric, for instance 8 ounce bed ticking made according to United States Government specifications for dust-proof and air-proof fabric. They are sewed together by longitudinal rows of stitching *k* spaced widely enough from one another to leave channels, open at both ends of the fabric, in which the straps *g* are placed, and from which the ends of these straps protrude. As clearly shown in Figure 3, the seams *k* which connect the cloths together at both sides of the straps or bands are preferably located as close as possible to the straps in order that the pockets, so formed, while being wide enough to permit easy insertion of the straps endwise, yet will otherwise be as narrow as possible so as to prevent tipping or canting of the

straps edgewise. Due to the medial connection of the inner straps *g* with the springs *f* through the holes *r*, this connection would be incapable of preventing tipping up of the straps upon localized pressure being applied midway between the adjacent straps. Such edgewise tipping of the straps is positively precluded since should pressure be concentrated midway between any two straps, the seams, due to their close propinquity to the edges of the straps or bands, will act to prevent edgewise tipping of the straps and thus insure the bed bottom maintaining a smooth, continuous contact surface for the mattress or cushion. However, the top sheet *h* is made both longer and wider than the area of the spring bottom as a whole, and its ends are wrapped about transverse reinforcing rods *l* and turned under the main body of the sheet, to which they are stitched by seams *m* and *n*. The length of the top sheet between the points at which it passes around the outer sides of the reinforcing rod is approximately equal to the length of the straps *g*, *g'*, so that in the assembled fabric the reinforcing rods and enveloping parts of the fabric covering sheet lie approximately over the ends of the straps. The sides of the top sheet are wrapped about the outermost straps *g'* and secured to the main part of the sheet by seams *o*.

The springs *f*, *f'* are made, conformably to common practice, with hooks *f'*, at opposite ends, one of which passes through a hole *b'* in the end rail *b* of the supporting frame, and the other through a hole, reinforced by a grommet *p*, in the cover *h*, and through an aligned hole *r* in the metal subjacent end of the metal strap. The grommets *p* are set in the cover *h* in a row close to the reinforcing rod *l* and with a spacing equal to that of the straps. Thus when the straps are in place and assembled with the cover fabrics, the holes in both are sufficiently accurately aligned to permit the hooks of the springs to be readily passed through them; the holes being preferably somewhat larger in diameter than the wire of which the springs are made. A somewhat closer spacing is provided for the holes in the ends of the outermost straps *g'* than the center line spacing between the intermediate straps, and the registering holes of the cover fabric are spaced accordingly.

The cover sheet *h* provides a continuous and smooth layer between the metal straps or bands and the overlying mattress or cushion, bridging over the spaces between the straps. The width, flatness and close spacing of the metal straps cooperate with the bridging effect of the cover sheet to prevent breaking of the fibers in the mattress stuffing and protrusion of any part of the mattress between the metal elements of the bottom fabric. A very serious difficulty heretofore has been the rapid deterioration of bed and couch mattresses due to the destructive effect of the bed springs heretofore used. Those of the types in almost universal use present widely separated wires in contact with the under side of the mattress. These may be the ends of helical springs in a box spring, or the wires of a reticulated bottom fabric suspended by springs at the ends. They support the mattress only along the lines where the wires extend, leaving wide spaces which are unsupported. The supporting reaction therefore is applied on narrow areas, which are hardly wider than lines, and on which the concentration of force due to the weight and movements of the occupant of the bed causes the fibers of the mattress stuffing, whether they be those of a

hair mattress, or a kapok (so-called silk floss) mattress, or a felt layer underlying the springs of an inner spring mattress, to be broken into short lengths. The unsupported parts of the mattress then bulge between the wires of the under fabric, making the mattress uncomfortable. This effect occurs rapidly with mattresses of the best quality as well as with those of inferior quality. I have removed the cause of this difficulty by the construction of my bed bottom herein described, which gives a wide and substantially uninterrupted support to the mattress and leaves no openings through which any part of it, whether stuffing, springs, etc. can protrude.

The upper cover sheet protects the mattress from being stained by the metal straps, and the two sheets together make a practically impervious barrier against the passage of lint from the mattress to the floor beneath the bed. However, the amount of lint, broken pieces of hair, etc. coming from the mattress is greatly reduced on account of the protective effect above described. In short, the new structure provides a smooth flat bed bottom which possesses inherent stiffness tending to hold it flat and resist bending, but at the same time sufficiently yielding for the comfort of the occupant.

An important feature is the end construction of the composite fabric, whereby the cover as well as the straps is directly hooked and coupled to the springs. Thus the springs hold the cover fabric out flat, preventing its ends from working in and leaving the ends of the straps exposed, and likewise preventing the cover from working into folds and wrinkles. The rods *l* at the ends of the cover reinforce it and distribute the pull of the springs uniformly across its width; holding its edge flush, or approximately so, with the ends of the straps and preventing any excessive strain being applied to the cloth or the steel bands at any point.

Not only does this spring preserve the mattress as above described, but its comparative stiffness and coherence makes it ideal for the beds of persons suffering from spinal disorders. It is the most uniform and level mattress foundation produced commercially up to the present time and, while being sufficiently flexible, yet does not yield locally, and so gives needed support to an injured or abnormal spine, which promotes restoration of the spine to correct condition.

What I claim and desire to secure by Letters Patent is:

1. A bed bottom of the class described having in combination with a frame and attaching springs, a multiplicity of closely spaced resilient flat supporting straps, said straps having their flat sides presented upwardly throughout the area of the bed bottom, a pair of parallel disposed cover clothes stitched together to provide longitudinal channels in which are positioned the supporting straps, reinforcing rods extending transversely of the ends of the straps, the upper cover cloth being longer than the lower cloth and bent around the reinforcing rods so as to extend inwardly adjacent the upper surface of the straps and connected to the under part of the main body of the upper cloth by transverse stitching, the straps at each end and the upper cloth along its transverse edges being provided with means directly connecting the straps and cloth to said springs whereby to maintain the cloth and straps continuously under tension, and provide a smooth continuous mattress contact surface, said cloth

and straps constituting a flat support for the mattress.

2. A supporting bottom for articles of furniture of the class described comprising, in combination
5 with a frame and attaching springs, a multiplicity of closely spaced resilient flat metal supporting straps, said straps having their flat sides presented upwardly throughout the area of the structure, a pair of parallel disposed cover cloths
10 stitched together to provide longitudinal channels in which are positioned the supporting straps, reinforcing rods extending transversely of the ends of the straps, one of said cover cloths being

longer than the distance between said reinforcing rods and bent around such rods so as to extend inwardly from the adjacent ends of the straps, and being connected to the main body of the same cloth by transverse stitching, the straps at each end and the cloth which is thus bent around the reinforcing rods being provided with registering means inward from the rods directly connecting the straps and cloth to said springs whereby to maintain the cloth and straps continuously under tension and provide a smooth continuous flat supporting surface.

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