

D. H. GAIL.
WIRE MATTRESS.

Patented Mar. 13, 1894.

Fig. 1

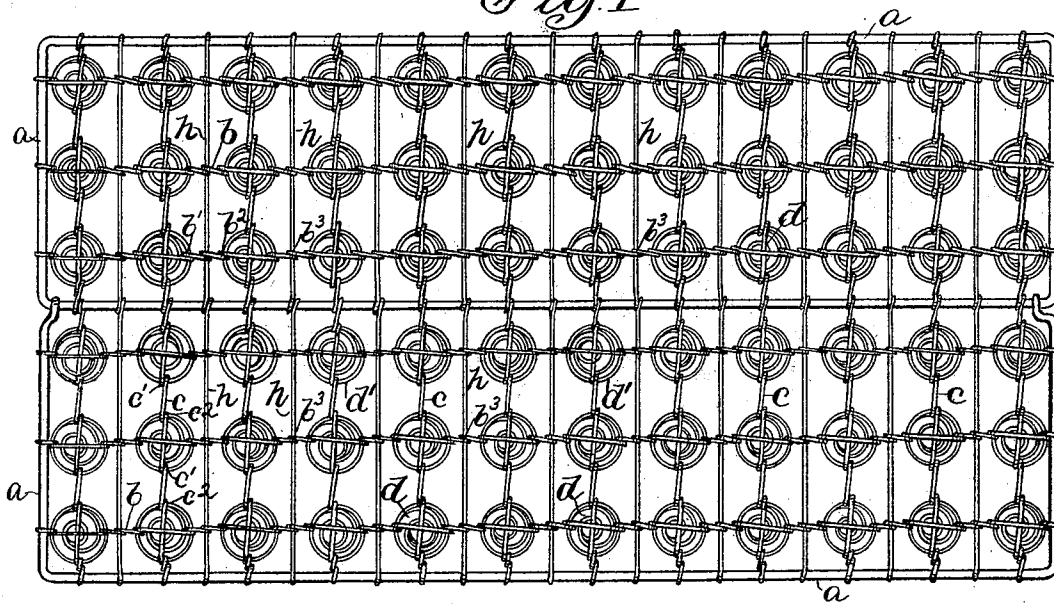


Fig. 2

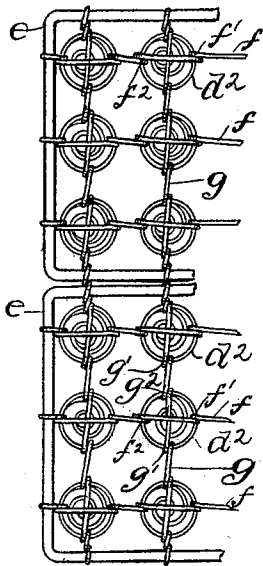


Fig: 3

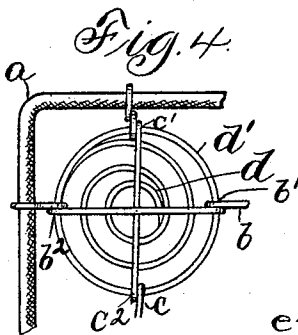


Fig. 5.

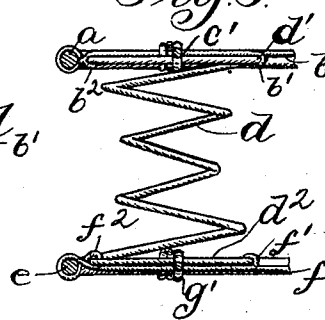
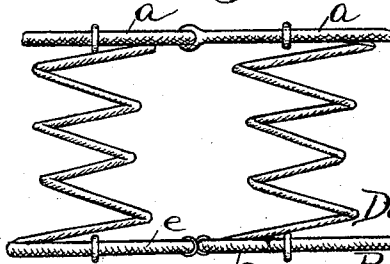


Fig. 6.



George L. Cragg.
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UNITED STATES PATENT OFFICE.

DANIEL H. GAIL, OF CHICAGO, ILLINOIS, ASSIGNOR TO LOUISA H. GAIL.

WIRE MATTRESS.

SPECIFICATION forming part of Letters Patent No. 516,195, dated March 13, 1894.

Application filed January 3, 1893. Serial No. 457,078. (No model.)

To all whom it may concern:

Be it known that I, DANIEL H. GAIL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Wire Mattresses, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to wire mattresses and, more particularly, to that class known as spiral spring all-wire mattresses in which a series of spiral wire springs are disposed between an upper and a lower wire frame.

My object is to simplify the construction of wire mattresses and to produce a mattress which, while possessing great elasticity, will be durable, and which will require a minimum of material in its construction.

Heretofore all-wire spring mattresses have principally been constructed by securing the larger end turns of each spring to the corresponding end turns of the adjacent springs. Since the smaller internal turns of mattress springs are much less yielding than the end turns, the effect of a force applied to the top of the spring is to cause the spring to telescope and if the spring rest directly upon one of the bed slats the different turns of the spring will successively come against the slat as it is depressed. If, however, the spring be not directly above one of the bed slats the smaller turns of the spring will pass entirely through the end turns and the spring being thus unduly strained its life is greatly impaired.

In Patent No. 399,867, granted J. F. Gail and myself, March 19, 1889, is shown an all wire mattress in which the ends of the springs are secured to upper and lower woven wire sections, the evil results of the undue telescoping of the springs being thus prevented.

My present invention is designed to replace the woven wire sections by intersecting wires to which the ends of the spring are attached thus securing all the advantage of having the ends of the springs closed to prevent the undue telescoping of the springs and at the same time greatly reducing the material necessary for the construction of the mattress.

My invention consists broadly in providing

upper and lower frames to which are secured intersecting wires; spiral springs are disposed at the intersections and secured to the intersecting wires preferably by means of loops or eyes in the wires through which the end turns of the springs pass.

My invention is illustrated in the accompanying drawings in which—

Figure 1 is a top view of a mattress embodying my invention. Fig. 2 is a partial bottom view thereof. Fig. 3 is a detailed view of a piece of the loop wire. Fig. 4 is a detail top view of a portion of the mattress showing the method of securing the springs in position. Fig. 5 is a side view of the same. Fig. 6 is a detail showing the method of hinging the two parts of the mattress together.

In the several figures like letters refer to like parts.

I have illustrated my invention in connection with a mattress composed of two hinged portions, but my invention is equally applicable to a non-folding mattress.

To the wire *a* forming the frame wire of the upper section of the mattress are secured by their ends the loop wires *b* extending longitudinally of the mattress and provided with loops *b'*, *b''*. At right angles to the wires *b* extend the transverse wires *c* provided with loops *c'*, *c''*. These loops extend downward and lie at approximately equal distances from the point of intersection of the wires *b* and *c*. Through the loops *b'*, *b''*, *c'* and *c''* extends the upper turn *d'* of the spiral spring *d* its end being slightly bent so that the spring will not be enabled to twist out of the loops. Likewise to the frame wire *e* of the lower section are secured the ends of the loop wires *f*, provided with the loops *f'*, *f''*, &c., and extending at right angles to the loop wires *g* which are provided with the loops *g'*, *g''*, &c. The loops upon the wires *f* and *g* extend upward and are approximately equally distant from the points of intersection of the wires so that the lower turn *d''* of the spiral spring may pass through the loops *f'*, *f''*, *g'* and *g''* being slightly bent after passing through the last loop so that it may be retained in position. The loop wires may be secured to the frame wires *a* and *e* by being bent around the same or in any preferred manner.

I have found it sometimes desirable to make

use of additional wires upon the upper section of the mattress for the purpose of reducing the size of the openings in the mattress between four adjacent springs and for the further purpose of strengthening the upper section so that tendency to collapse will be provided against. When such wires are used I provide additional loops *b*³ in the loop wires *b* of the upper section extending downward, and through which pass the straight wires *h*, their ends being attached to the frame wire *a* by being lapped or bent about the same or in any preferred manner. Strengthening wires may also be run longitudinally but such longitudinal strengthening wires are not so essential as the transverse wires, as the tendency to collapse in a longitudinal direction is much less. These wires serve to diminish the areas of the openings in the top of the mattress and also to strengthen it for, when a force is applied to the top of the mattress, the tendency is to draw the opposite frame wires *a* toward one another, which tendency must be resisted by the transverse wires. Thus, the straight wires *h* assist the loop wires in preventing the undue approach of the opposite frame wires and the consequent collapse of the mattress. These additional wires are not so desirable upon the lower section of the mattress as the large openings are not objectionable and as there is not the same tendency of the frame wires to approach when force is applied to the top of the mattress.

It is not essential that the loop wires should be perpendicular to one another, and to the frame wires, but I consider such a construction the most advantageous. The loop wires instead of being transverse and longitudinal, might be diagonal, or, in fact diagonal loop wires might be added to the construction shown in the drawings whereby the openings in the top of the mattress could be further reduced and additional strength secured. Nor is it essential that the loop through which the end turns of the springs pass, should be concentric with the intersection of the loop wires, but I consider such a construction the most advantageous. It is evident however that my invention is susceptible of modifications in matters of detail and I therefore, do not wish to be limited to the details of construction shown and particularly described.

In a mattress constructed in the above described manner, the effect of a force applied to the top of the mattress is to cause a telescoping of the springs, but the turns of the

springs as they successively come into contact with the intersecting wires of the upper and lower sections are prevented from further motion and all undue strain upon the springs is prevented.

When it is desired to make the mattress so that it may be folded, the frame wires of the upper section may be secured together so that a hinged joint may be provided, the lower section being made in two independent parts.

Mattresses constructed after my invention may be readily adapted to the construction of the seats and backs of easy chairs and sofas, and I therefore, wish the term, mattress, used in this broad sense.

When desirable, a woven wire mat may be applied to my mattress, the same being secured at its edges to the frame wires.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a mattress, the combination with a frame, of wires extending between the opposite sides of said frame, said wires being jointly of sufficient strength to resist bending when subjected to compression in a longitudinal direction, said wires being bent to form loops with horizontal openings, and spiral springs, the end turns thereof being adapted to pass through said loops; whereby the springs are caused to maintain their relative positions and the tendency of the sides of the frame to unduly approach is resisted, substantially as described.

2. In a mattress, the combination with the frame wires, of the transverse and longitudinal wires extending between said frame wires and bent to form loops with horizontal openings, spiral springs, the end turns thereof passing through said eyes, and stiffening wires extending transversely between the frame wires and passing through loops provided in said longitudinal wires, said stiffening wires and said transverse wires being of sufficient stiffness jointly to resist bending when subjected to compression in a longitudinal direction, thereby preventing the opposite frame wires from unduly approaching, substantially as described.

In witness whereof I hereunto subscribe my name this 30th day of December, A. D. 1892.

DANIEL H. GAIL.

Witnesses:

JOHN F. GAIL,

W. CLYDE JONES.