

(No Model.)

W. J. MORGAN.  
EXPANSION SPRING FOR SEATS.

No. 507,027.

Patented Oct. 17, 1893.

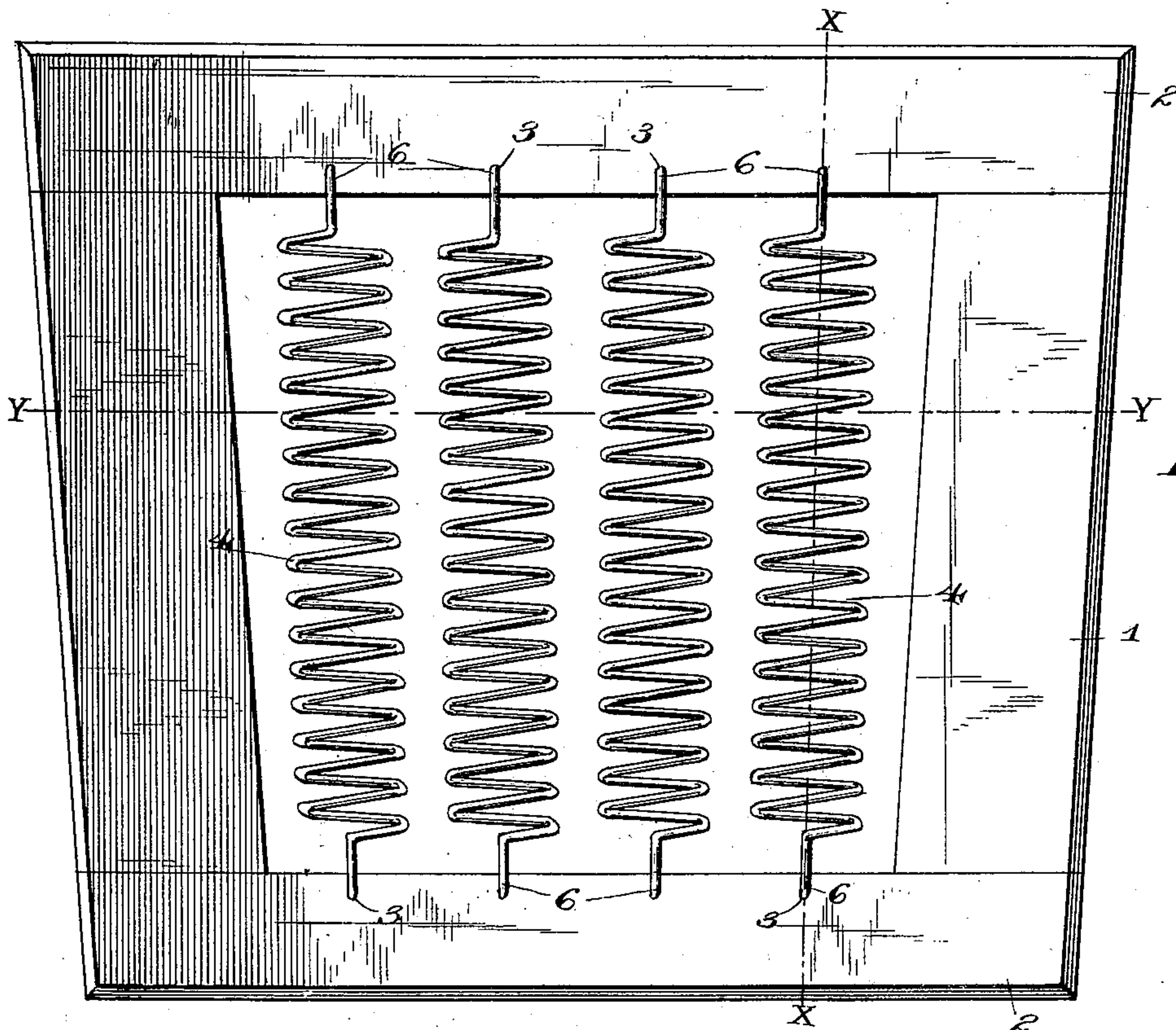


Fig. 1.

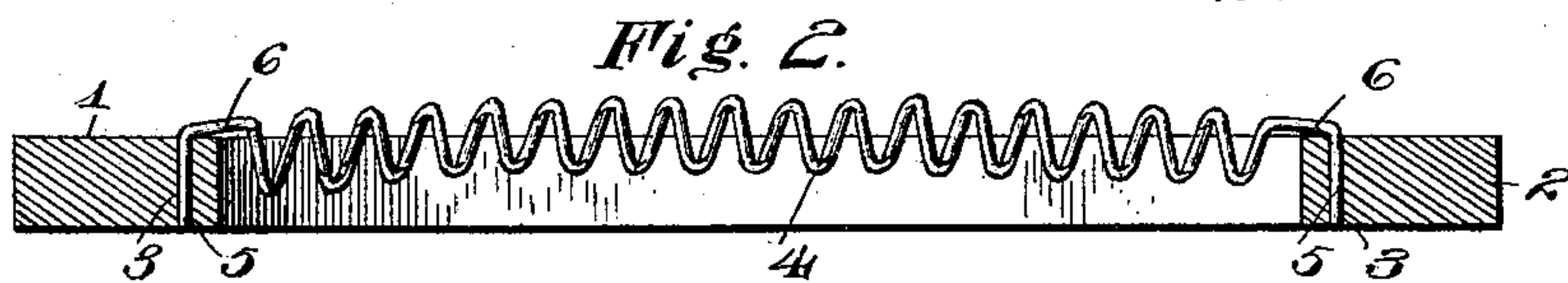


Fig. 2.

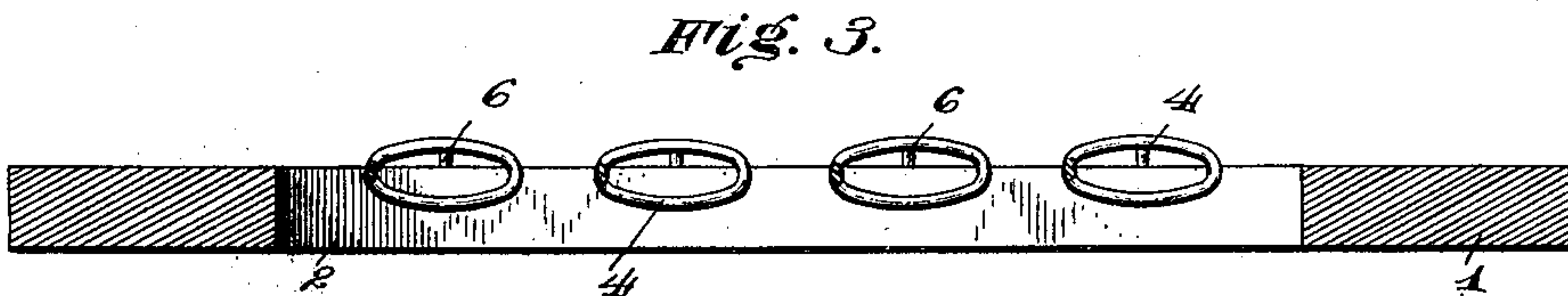
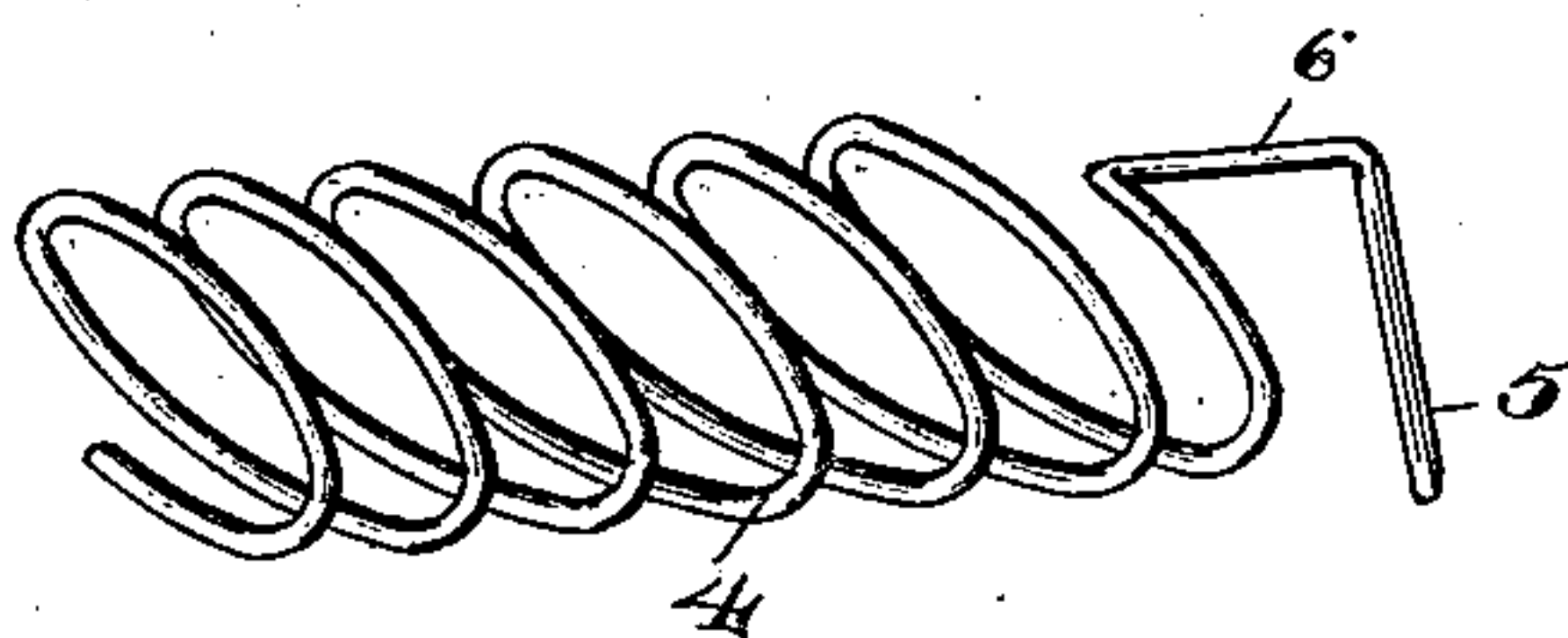


Fig. 3.

Fig. 4.



Witnesses  
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# UNITED STATES PATENT OFFICE.

WILLIAM J. MORGAN, OF HILLSBOROUGH, OHIO.

## EXPANSION-SPRING FOR SEATS.

SPECIFICATION forming part of Letters Patent No. 507,027, dated October 17, 1893.

Application filed December 24, 1892. Serial No. 456,249. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM J. MORGAN, a citizen of the United States, residing at Hillsborough, in the county of Highland and State of Ohio, have invented a new and useful Expansion-Spring for Seats, of which the following is a specification.

My invention relates to springs for chair, buggy, carriage and car-seats, sofas, lounges, bed-bottoms, &c., the objects in view being to provide a simple, cheap and durable spring, capable of general use and adapted to be supported and detachably secured at its terminals to the frame, without intermediate braces, slats or other supporting or retaining devices.

It is my object, furthermore, to provide a spring which, without intermediate supports or braces, shall be of such construction and shall be so secured to the frame as to prevent excessive lateral and vertical deflection of the intermediate portion, while providing a gentle and easy resilience which is desirable in articles of the class above mentioned.

A further object of my invention is to provide a spring having the maximum bearing surface for the pressure of the cushion or mattress, and which shall be free from projecting angles, points, ends of wires, &c., which chafe and wear the covers of such cushions or mattresses.

It is well known that if two or more wires intersect each other at or near the bearing surface of the cushion or mattress, so that the latter constantly or occasionally is in contact therewith, the relative movements of the parts ultimately cause the wearing and injury of the same; and such intersections also cause rattling and other annoying sounds. It is my object therefore, to provide a spring having no intersections; all of the parts thereof being free and independent of each other.

Further objects and advantages of my invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings: Figure 1 is a plan view of a chair-seat provided with springs embodying my invention. Fig. 2 is a longitudinal sectional view of the same, upon line  $x-x$  of Fig. 1. Fig. 3 is a transverse sectional view of the same upon line  $y-y$  of Fig. 1. Fig. 4 is a de-

tail view, in perspective, of one of the springs, detached.

1 designates the frame of a chair-seat, opposite bars 2 of which are provided with series of sockets or perforations 3, and 4 designates the springs which are arranged in the frame and are provided with terminal tangs 5, bent at approximate right-angles to the axis of the spring and fitting in the sockets or perforations 3.

The spring consists of a flattened or elliptical coil, each member of which forms an ellipse whose major axis is horizontally and transversely disposed to present a flattened upper surface for the pressure of the cushion or mattress.

The ends or terminals of the spring are extended longitudinally, parallel with the axis of the spring to form arms or extensions 6, whose free ends are bent downward to form the tangs 5. These tangs are not arranged precisely at right-angles to the axis of the spring (or to the arms 6) but are inclined slightly outward to form an obtuse angle with the axis, as shown clearly in Fig. 4, and the sockets or perforations 3, in the frame, are vertically disposed, as shown in Fig. 2, whereby, when the springs are attached to the frame by the engagement of the tangs in the sockets, the intermediate or central portions of the springs are bowed upward, slightly, as shown in said Fig. 2. This arrangement of the springs adds to their strength and durability and prevents the sagging of the unsupported portions thereof, between the points of attachment to the frame. Furthermore, the length of the springs is so adjusted that when in their normal shape they are shorter than the distance between the points of support, thereby necessitating the stretching or extension of each spring as it is applied to the frame. Thus, the springs are applied to the frame under tension thereby preventing accidental displacement, rattling and unnecessary deflection or depression at points between the supports.

Referring to the drawings, Figs. 1, 2 and 4, it will be noted that the coils, or the coiled portions of the springs, terminate at the upper sides of the springs, whereby the arms or extensions are extended in the plane of the upper surfaces of the springs, thus bringing



the upper surfaces of the ends of the coils approximately in the plane of the upper surface of the frame. It will be observed, furthermore, that all parts of the springs are free  
5 and out of contact with each other, whereby friction and rattling are avoided. The adjacent springs are separated sufficiently to prevent contact with an ordinary strain.

The construction of the improved spring is  
10 simple, and it may be cheaply manufactured.

Changes in the form, proportion and minor details of construction may be resorted to without departing from the principles or sacrificing any of the advantages of the invention.

15 Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. The combination with a supporting frame-work provided with sockets, of a coil  
20 spring provided with terminal tangs to engage sockets in opposite sides of the frame-work, the angle between the tang and the axis of the coil being different from the angle between said sockets and the plane of the supporting frame-work, whereby when the said  
25 tangs are fitted in the sockets, the center unsupported portion of the coil is bowed out of the plane of the frame-work, substantially as specified.

30 2. The combination with a supporting frame-work provided with sockets arranged at right angles to the plane of its upper surface, of flattened elliptical coiled springs provided with integral terminal extensions in

the plane of one side of the coil and having  
35 their extremities bent to form tangs which are arranged at obtuse angles to the axis of the coil to fit in sockets in opposite sides of the supporting frame-work, whereby the upper side of the coil at its ends is substantially  
40 in the plane of the upper surface of the frame-work, and the center unsupported portion of the coil is bowed upwardly above the plane of the frame-work, substantially as specified.

3. In combination with a supporting frame-  
45 work provided with vertical sockets or perforations, a coiled spring provided with terminal tangs arranged at obtuse angles to the axis of the coil and fitted in sockets or perforations in different sides of the frame  
50 whereby the central unsupported portion of the coil is bowed, substantially as specified.

4. In combination with a supporting frame-  
work, a series of flattened or elliptical coiled  
55 springs, arranged horizontally in said frame-work, and means for connecting the springs terminally to the frame under tension, the intermediate portions of such springs being free of support and being out of contact and  
60 unconnected with each other, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM J. MORGAN.

Witnesses:

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A. D. WIGGINS.