(No Model.)

J. E. LONG.

SPRING FOR CHAIRS, &c.

No. 601,573. Patented Mar. 29, 1898.

Fig. 1.

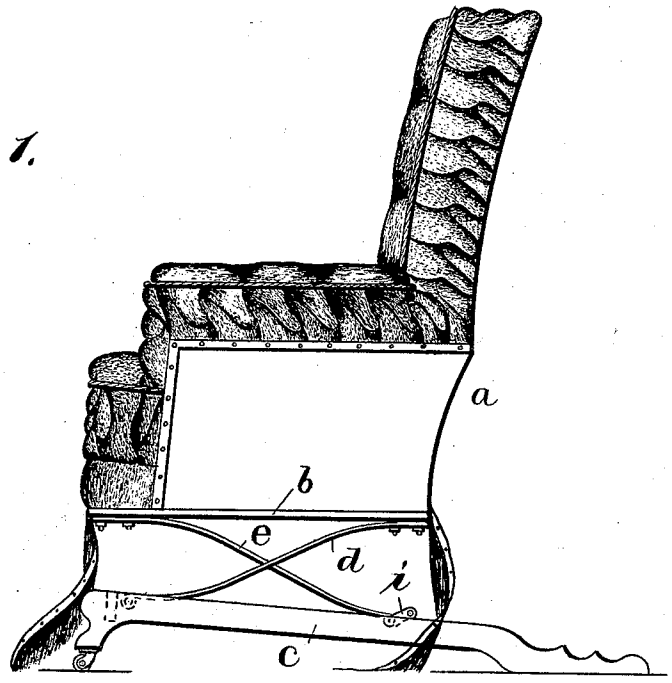

Fig. 2.

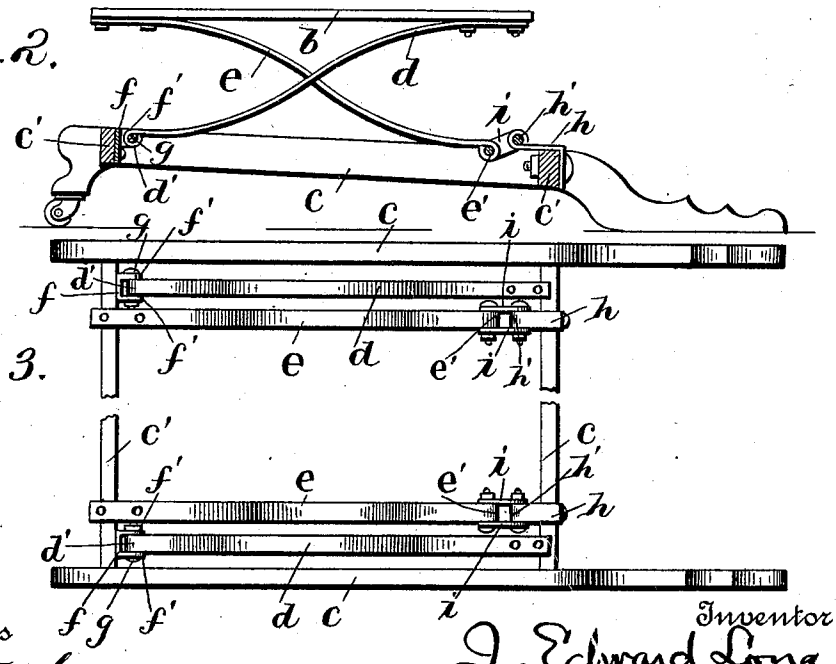

Fig. 3.

Witnesses
Geo. E. Frech.
A. S. Pattison.

Inventor
J. Edward Long
by Hubert E. Rock
Attorney

UNITED STATES PATENT OFFICE.

JOHN EDWARD LONG, OF CHILLICOTHE, OHIO.

SPRING FOR CHAIRS, &c.

SPECIFICATION forming part of Letters Patent No. 601,573, dated March 29, 1898.

Application filed April 7, 1897. Serial No. 631,183. (No model.)

To all whom it may concern:

Be it known that I, JOHN EDWARD LONG, of Chillicothe, county of Ross, and State of Ohio, have invented new and useful Improvements in Springs for Chairs, Lounges, and the Like; and I do hereby declare that the following is a full, clear, and exact description of the same.

This invention relates to certain improvements in spring-supports for chairs, lounges, and the like; and the invention consists in certain novel features of construction and in combinations and in arrangements of parts, as more fully described and particularly set forth and specified hereinafter.

Referring to the accompanying drawings, Figure 1 is a side elevation of a spring rocking-chair provided with a construction of spring-support illustrating my invention, the bottom fringe of the chair removed to show the spring-support. Fig. 2 is a detail side elevation of the base of a chair, shown partially in section to clearly illustrate the manner of mounting the springs. Fig. 3 is a detail top plan of the base of the chair with the seat bottom or frame removed.

The drawings illustrate the invention applied to a spring rocking-chair; but it should be understood that my invention is not limited to such specific application, as it can be and is applied to lounges and other seats.

In the drawings, *a* is a chair having a bottom seat-frame *b*. *c* is the base of the chair, having the front and rear cross-bars *c' c'*. The spring-support sustains the chair and is interposed between said seat-bottom frame and said base and comprises several pairs of separate springs *d e*. The springs are preferably all of like shape and construction, each spring usually bent to form a compound curve, or approximately compound curve, with the straight upper end secured by bolts or other suitable means to the under side of the seat-bottom frame, and from thence curving downwardly with an upward deflection, while on the opposite of the center of its length the spring curves outwardly toward a cross-bar with a downward deflection, the end of the spring being confined to a cross-bar of the base.

The springs are preferably arranged in pairs, the springs of each pair being adjacent, but out of contact, with one spring extending from one side or end of the seat-bottom to the cross-bar at the corresponding opposite end of the base, while the other spring extends from the opposite end of the seat to the opposite end cross-bar. The lower end of one spring of a pair is mounted on a pivot confined in a bracket or part rigid with a cross-bar, while the lower end of the other spring is connected by a loose link or other loose coupling with its cross-bar to permit a vertical movement and play of the lower end of said spring.

Thus in the particular construction of a spring-rocker shown in the drawings two pairs of plate or bar springs are employed, arranged beneath opposite sides of the chair-seat, with the springs *d d* extending from the rear end of the chair to the front cross-bar and provided with transverse eyes *d'* at their lower front ends, formed in any suitable manner, as by bending around the ends of said springs.

Plates or brackets *f* are rigidly secured at the inner edge of the front cross-bar and each formed with a pair of rearward projections *f'*. The end of the spring is placed between the projections, and a bolt *g* is passed through the projections and the eyes *d'* of the spring. The rear cross-bar is also provided with suitable brackets, such as angle plates or bars *h*, each secured to the rear edge of the bar and extending forwardly over the upper edge thereof, with the transverse eye *h'* at its front end in advance of the cross-bar. The rear ends of the springs *e*, extending rearwardly from the front end of the seat, are also each formed with a transverse eye *e'*, and a pair of links *i* loosely connect each spring to its respective bracket *h* by pivot-bolts passed through the links arranged on opposite sides of the bracket and spring end and through the eyes of said bracket and spring.

The eyes *h'* of the brackets *h* are arranged a distance above the horizontal plane of the eyes *d'* of the front ends of springs *d*. The eyes *h'* also are arranged a distance in front of the bar *c'*, so that the links *i* are free to swing downwardly and rearwardly toward the bar *c'* with the rear ends of the spring *e*

to allow the proper rocking or swinging movement as the front ends of the springs *d* turn on their fixed pivotal points.

In view of the very advantageous fact that the separate springs *d e* are materially alike, the peculiar arrangement of the brackets *h* permits the lower ends of the pairs of springs to normally lie in approximately the same horizontal plane, as shown in Fig. 2, so that the chair-seat is normally about horizontal when not occupied, although this can be varied.

Material practical advantages are attained by employing the separate plate-springs, all arranged in parallel vertical planes with the springs arranged to directly support the front and rear of the chair or other seat in contradistinction to a single rod or wire bent to form in itself the spring-support of the chair and having vertical coils with transverse portions of the wire secured to opposite ends of a cross-bar arranged beneath the center of the seat. By employing plate-springs separately secured to the front part of the seat and extending back to the base at a point beneath the rear part of the seat and by having additional plate-springs extending from the rear of the seat forwardly to the base at a point beneath the front of the seat the chair-seat is most strongly supported at all necessary points at front and back, and the strain on the fastenings is widely distributed, and hence reduced to a minimum at any one point, rendering the chair-support most strong and durable and attaining a most desirable swing and rocking movement. If any spring should become weak or injured, it can be most quickly and easily removed by taking out the bolts or screws securing its upper end and the bolt at its lower end without removing or disturbing the remaining springs. A new spring can then be inserted easily and at a minimum cost, and this advantage is enhanced by the fact that the springs are all alike or approximately alike.

It is evident that various changes might be made in the forms, constructions, and arrangements of the parts described without departing from the spirit and scope of my invention. Hence I do not wish to limit myself to the exact constructions described and shown.

What I claim is—

1. In combination, a seat portion, a base, and the spring-support for the seat comprising several pairs of separate plate-springs, all the springs materially alike, and arranged in parallel vertical planes, the springs of each pair having the straight upper ends separately secured to the seat at widely-separated points and from thence extending downwardly in opposite directions and confined to the base at widely-separated points, one spring of each pair having an eye at its lower end confined to turn on a fixed pivot, and the remaining spring of each pair having an eye at its lower end confined by a loose swinging link to the base, whereby the seat is supported at widely-separated points and any spring can be separately removed, substantially as described.

2. In combination, a base, a seat portion, and a spring-support composed essentially of several pairs of separate plate-springs all arranged in vertical parallel planes, the springs all materially alike and secured at separate points and arranged in pairs, one spring of each pair secured to the front of the seat and extending downwardly and rearwardly, and a loose link connection between its lower end and the rear of the base, the other spring of each pair secured to the rear of the seat and extending downwardly and forwardly and at its lower end having a fixed pivotal connection with the front part of the base, substantially as described.

3. In combination, a seat portion, a base having a front cross-bar with ears extending rearwardly from opposite ends of its inner sides and carrying pivots, and a rear cross-bar having brackets extending forwardly from its opposite portions and provided at their front upper ends with loose links, and the several pairs of separate flat plate-springs, certain springs at their upper ends secured to opposite portions of the front of the seat and extending downwardly and rearwardly and at their lower ends separately coupled to said loose links, and the remaining springs secured to opposite portions of the rear of the seat and extending downwardly and forwardly and separately mounted on said pivots, substantially as described.

4. In combination, a base having cross-bars at its opposite portions, the seat portion, the plate-springs all substantially alike, and each spring bent to form approximately a compound curve with the substantially straight upper end and the transverse eye at its lower end, the springs arranged in pairs, respectively, beneath opposite ends of the seat, the springs of each pair out of contact with each other and separately secured at their upper ends, respectively, at opposite ends of the seat portion and from thence extending downwardly in opposite directions, the eye of one spring mounted to turn on a fixed support secured to one cross-bar at the end portion thereof, and the eye of the other spring mounted loosely in the free end of a swinging link loosely joined to the end portion of the other cross-bar, substantially as described.

JOHN EDWARD LONG.

Witnesses:
H. E. HOLLAND,
F. S. HAWK.