No. 867,952. PATENTED OCT. 15, 1907.

F. P. D'ARCY.

SPRING.

APPLICATION FILED DEC. 22, 1906.

2 SHEETS—SHEET 1.

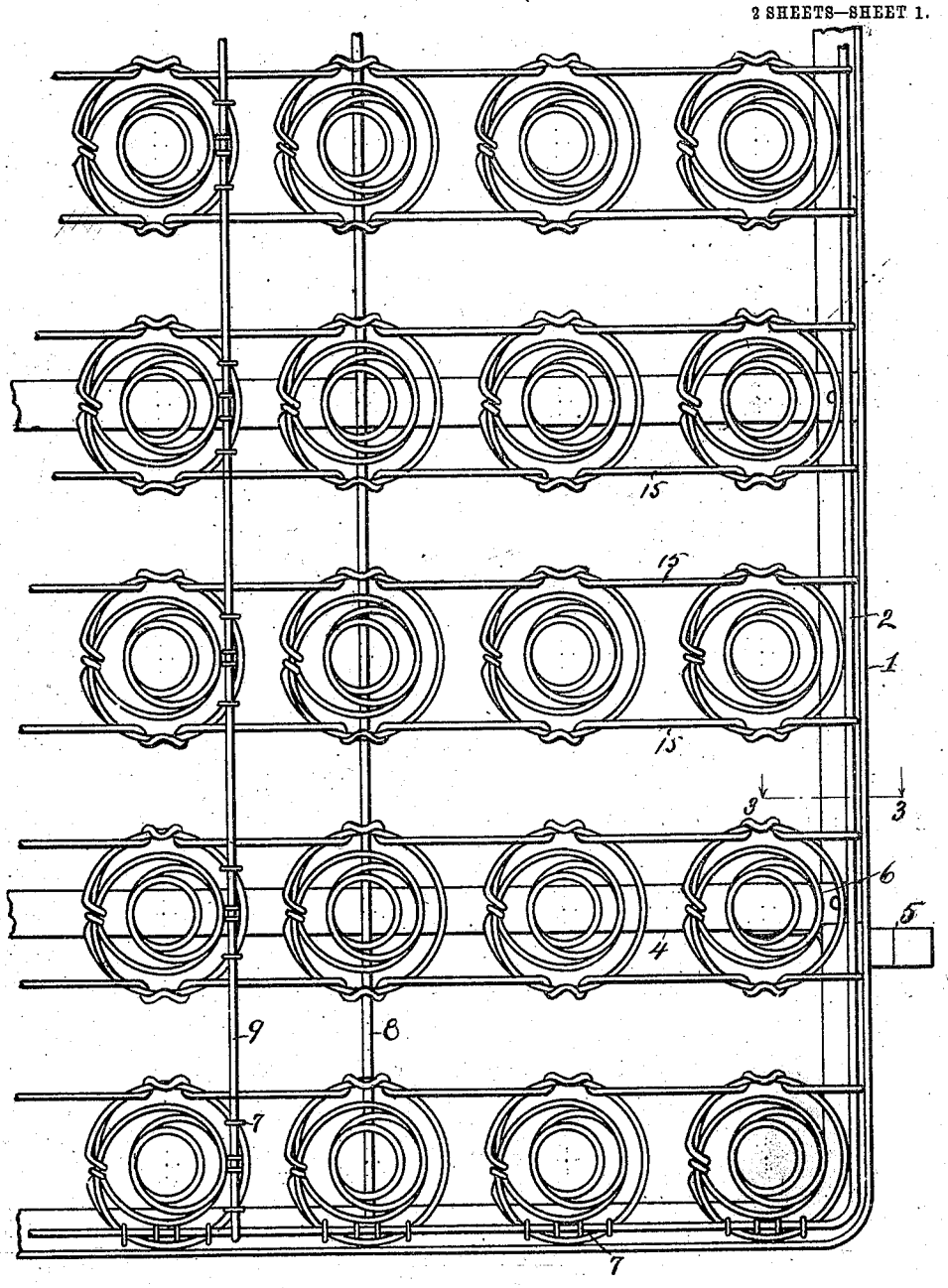


Fig. 1.

Witnesses:

Lulu Greenfield

Gertrude Taleman

Inventor,

Frank P. D'Arcy

By Chappell & Earl

Att'ys

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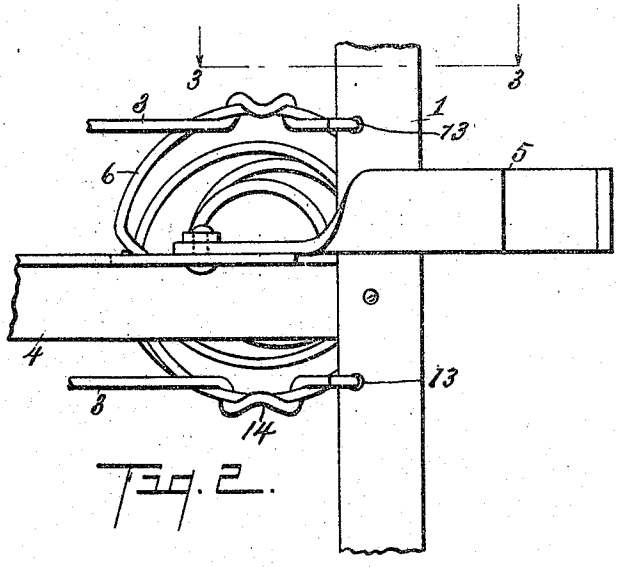


Fig. 2.

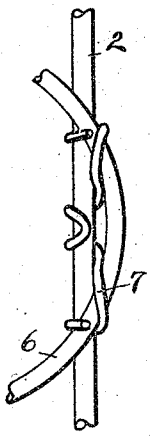


Fig. 4.

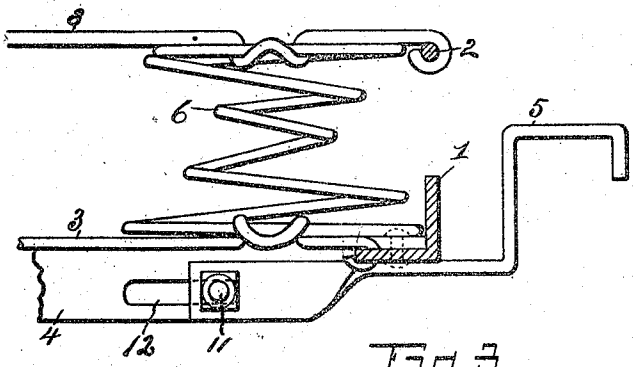


Fig. 3.

Witnesses:

Lulu Grunfield

Gertrude Tallman

Inventor,

Frank P. D'Arcy

By Chappell & Earl

Att'ys

UNITED STATES PATENT OFFICE.

FRANK P. D'ARCY, OF KALAMAZOO, MICHIGAN.

SPRING.

No. 867,952. Specification of Letters Patent. Patented Oct. 15, 1907.

Application filed December 22, 1906. Serial No. 349,111.

To all whom it may concern:

Be it known that I, FRANK P. D'ARCY, a citizen of the United States, residing at the city and county of Kalamazoo, State of Michigan, have invented certain new and useful Improvements in Springs, of which the following is a specification.

This invention relates to improvements in spring structures for beds, couches, and the like.

The objects of this invention are, first, to provide an improved spring structure of the class described in which the springs of the double helically coiled form are very securely supported and held in an upright position. Second, to provide in a structure of the class described an improved metal frame and support for the springs which, although comparatively light in weight, is very strong and rigid and very durable. Third, to provide an improved bed or couch spring, which may be adjusted within the limits of its scope to fit varying sizes of beds.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification. The invention is clearly defined and pointed out in the claims.

A structure embodying the features of my invention is clearly illustrated in the accompanying drawing, forming a part of this specification, in which,

Figure 1 is a detail plan of my improved spring structure. Fig. 2 is an enlarged inverted detail, showing the supports for the springs and the details of the frame construction. Fig. 3 is an enlarged detail section taken on a line corresponding to line 3—3 of Figs. 1 and 2. Fig. 4 is an enlarged detail, showing the clip for securing the outer row of springs to the frame wire 2 and to the longitudinal tie-wires 8.

In the drawing, the sectional views are taken looking in the direction of the little arrows at the ends of the section lines, and similar reference characters refer to similar parts throughout the several views.

Referring to the drawing, the frame of my improved spring structure consists of the side and end rails 1, formed of angle-iron, the same being preferably of one piece bent into suitable rectangular shape and the ends welded together to make the same continuous. The angle of the frame is preferably arranged downwardly and outwardly, so that the springs can be arranged close to the edges of the structure, and also to provide a suitable attaching means for the frame cross-pieces 4 and the spring supports 3. These cross-pieces 4 are also preferably formed of angle-iron with the vertical legs thereof projecting downwardly, as clearly appears in Figs. 2 and 3. The suspending hooks 5 are adjustably secured to the cross-pieces 4 by means of bolts 11 arranged in the longitudinal slots 12 provided therefor in the cross-pieces. The hooks 5 are preferably formed of flat bars of metal twisted,—as clearly appears from the drawings,—to bring their inner ends in a vertical position to rest against the cross-pieces and to receive the bolts 11. The hooks 5 are adapted to engage the side rails of the bed. By this adjustable feature, the structure may be adapted to various sizes of beds, as they are ordinarily constructed, it being understood, of course, that the springs are made for full-sized, and half-size or single beds.

The double helically coiled springs 6 are supported by the supporting wires or rods 3, which are arranged in parallel pairs beneath and within the peripheries of the bottom coils of each row of springs. The ends of these supporting-rods are engaged in suitable holes 13 provided therefor in the bottom or inwardly projecting legs of the angle-iron frame. These supporting-wires are provided with loop-like spring-engaging hooks 14 intermediate of their lengths which engage over the bottom coils of the springs, the ends of the hooks being kinked up or clamped to securely engage the springs. These supporting-wires are described in detail in my co-pending application filed concurrently herewith. By this means, the springs are securely attached to the supporting-rods, so that it is impossible to twist or rock the springs thereon, and the supporting-rods are also secured so that they are not likely to twist, which is a very great advantage, as it obviates any creaking or noise which would occur if the parts were free to move upon each other. The tops of the springs are secured together by similar tie-wires 15, the ends of which are secured to the frame-wire 2, which extends entirely around the structure. Only one tie-rod 15 is provided for the end rows of springs, the end portion of the frame-wire 2 being adapted to serve the purpose of the other, the springs being secured thereto by clips 7, the clips being preferably those illustrated and described in Letters Patent No. 785,410. issued to me on the 21st day of March, 1905.

Longitudinal supporting wires 8 are arranged to rest upon the frame cross-piece 4, the supporting-rods 3 being arranged over the same. The ends of these wires are secured to the end pieces of the frame 1, thus providing a strong support for the cross-rods. I also preferably provide longitudinal tie-rods 8 for the tops of springs, which are secured to the frame-wire 2 at their ends. These longitudinal tie-rods are arranged to cross the upper coils of a longitudinal row of springs and are secured thereto by the clip 7. This ties the cross tie-wires together. By this means, the springs are so supported that the twisting or a side-wise movement thereof is effectively prevented. They are so connected and secured together that the weight of a person thereon is distributed over a number of springs, thus enabling the use of lighter, "softer" springs than would otherwise be possible. The parts are also so secured that movement

of the springs on their engaging parts is prevented, so that the structure is practically noiseless.

Another advantage is that the structure may be made of very light material and still, on account of the form and disposition of the parts, the frame be rigid and strong.

A still further advantage is that the parts are comparatively economical to produce, and the structure is easily assembled.

I have illustrated and described my improved spring structure in detail in the form preferred by me. I am, however, aware that it is capable of considerable variation in structural details without departing from my invention.

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

1. In a spring structure, the combination with the frame, comprising angle-iron side and end rails arranged with the angle outward and with the outer legs projecting upwardly, of angle-iron cross-pieces secured to the inwardly projecting horizontal legs of the side pieces arranged with their vertical legs projecting downwardly, said downwardly projecting legs of said cross-pieces having longitudinal slots therein; bed-rail engaging hooks secured to said cross-pieces by bolts arranged through the said slots therein; double helically coiled springs arranged in rows; supporting-wires arranged in parallel pairs beneath the bottom coils of each row of springs and within their peripheries, said supporting-wires having outwardly extending spring engaging hooks formed intermediate their lengths, said hooks being engaged over and clamped upon the bottom coils of each spring, the ends of said supporting-wires being engaged in suitable perforations provided therefor in the horizontal legs of said frame; longitudinal supporting wires secured at their ends to the horizontal legs of the frame, arranged over the cross-pieces thereof and under said spring supporting-wires; tie-wires arranged in parallel pairs corresponding to said pairs of supporting wires, having outwardly extending hooks formed intermediate their lengths, engaged over and clamped upon the top coils of each row of springs; longitudinal tie-wires arranged over the said cross tie-wires and above a longitudinal row of springs and secured to the top coils thereof by suitable clips; and an outer continuous frame-wire to which the ends of said tie-wires are secured, for the purpose specified.

2. In a spring structure, the combination with the frame, comprising angle-iron side and end rails arranged with the angle outward and with the outer legs projecting upwardly, of cross-pieces secured to the inwardly projecting horizontal legs of the side pieces; double helically coiled springs aranged in rows; supporting-wires arranged in parallel pairs beneath the bottom coils of each row of springs and within their peripheries, said supporting wires having outwardly extending springs engaging hooks formed intermediate their lengths, said hooks being engaged over and clamped upon the bottom coil of said spring, the ends of said supporting-wires being engaged in suitable perforations provided therefor in the horizontal legs of said frame; longitudinal supporting-wires secured at their ends to the horizontal legs of the frame arranged over the cross-pieces thereof and under said spring supporting wires; tie-wires arranged in parallel pairs corresponding to said pairs of supporting-wires, having outwardly extending hooks formed intermediate their lengths, engaged over and clamped upon the top coils of each row of springs; longitudinal tie-wires arranged over the said cross tie-wires and above a longitudinal row of springs and secured to the top coils thereof by suitable clips; and an outer continuous frame-wire to which the ends of said tie-wires are secured, for the purpose specified.

3. In a spring structure, the combination with the frame, comprising angle-iron side and end rails arranged with the angle outward and with the outer legs projecting upwardly, of double helically coiled springs arranged in rows; supporting-wires arranged in parallel pairs beneath the bottom coils of each row of springs and within their peripheries, said supporting-wires having outwardly extending spring engaging hooks formed intermediate their lengths, said hooks being engaged over and clamped upon the bottom coil of each spring, the ends of said supporting-wires being engaged in suitable perforations provided therefor in the horizontal legs of said frame; longitudinal supporting-wires secured at their ends to the horizontal legs of the frame, arranged under said spring supporting-wires; tie-wires arranged in parallel pairs corresponding to said pairs of supporting-wires, having outwardly extending hooks formed intermediate their lengths, engaged over and clamped upon the top coils of each row of springs; longitudinal tie-wires arranged over the said cross tie-wires and above a longitudinal row of springs and secured to the top coils thereof by suitable clips, and an outer continuous frame-wire to which the ends of said tie-wires are secured, for the purpose specified.

4. In a spring structure, the combination with the frame, comprising angle-iron side and end rails arranged with the angle outward and with the outer legs projecting upwardly, of double helically coiled springs arranged in rows; supporting-wires arranged in parallel pairs, beneath the bottom coils of each row of springs and within their peripheries, said supporting-wires having outwardly extending spring engaging hooks formed intermediate their lengths, said hooks being engaged over and clamped upon the bottom coil of said spring, the ends of said supporting-wires being engaged in suitable perforations provided therefor in the horizontal legs of said frame; tie-wires arranged in parallel pairs corresponding to said pairs of supporting-wires, having outwardly extending hooks formed intermediate their lengths, engaged over and clamped upon the top coils of each row of springs; longitudinal tie-wires arranged over the said cross tie-wires and above a longitudinal row of springs and secured to the top coils thereof by suitable clips; and an outer continuous frame-wire to which the ends of said tie-wires are secured, for the purpose specified.

5. In a spring structure, the combination with the frame, comprising angle-iron side and end rails arranged with the angle outward and with the outer legs projecting upwardly, angle-iron cross-pieces secured to the inwardly projecting horizontal legs of the side pieces arranged with their vertical legs projecting downwardly, said downwardly projecting legs of said cross-pieces having longitudinal slots therein; bed-rail engaging hooks secured to said cross-pieces by bolts arranged through the said slots therein; double helically coiled springs arranged in rows; supporting-wires arranged in parallel pairs beneath the bottom coils of each row of springs and within their peripheries, said supporting-wires having outwardly extending spring engaging hooks formed intermediate their lengths, said hooks being engaged over the bottom coil of each spring, the ends of said supporting-wires being engaged in suitable perforations provided therefor in the horizontal legs of the side rails of said frames; longitudinal supporting-wires secured at their ends to the horizontal legs of said frame arranged over the cross-pieces thereof and under said spring supporting-wires; cross and longitudinal tie-wires for the tops of said springs; and an outer continuous frame-wire to which the ends of said tie-wires are secured, for the purpose specified.

6. In a spring structure, the combination with the frame, comprising angle-iron side and end rails arranged with the angle outward and with the outer legs projecting upwardly, of angle-iron cross-pieces secured to the inwardly projecting horizontal legs of the side pieces arranged with their vertical legs projecting downwardly, said downwardly projecting legs of said cross-pieces having longitudinal slots therein; bed-rail engaging hooks secured to said cross-pieces by bolts arranged through the said slots therein; double helically coiled springs arranged in rows; supporting-wires arranged in parallel pairs beneath the bottom coils of each row of springs and within their peripheries, said supporting-wires having outwardly extending spring engaging hooks formed intermediate their lengths, said hooks being engaged over the bottom coil of each spring, the ends of said supporting-wires being engaged in suitable perforations provided therefor in the

horizontal legs of the side rails of said frame; and longitudinal supporting-wires secured at their ends to the horizontal legs of said frame, arranged over the cross-pieces thereof and under said spring supporting wires, for the purpose specified.

7. In a spring structure, the combination with the frame, comprising angle-iron side and end rails arranged with the angle outward and with the outer legs projecting upwardly, of cross-pieces secured to the inwardly projecting horizontal legs of the side pieces; double helically coiled springs arranged in rows; supporting-wires arranged in parallel pairs beneath the bottom coils of each row of springs and within their peripheries, said supporting wires having outwardly extending spring engaging hooks formed intermediate their lengths, said hooks being engaged over the bottom coil of each spring, the ends of said supporting-wires being engaged in suitable perforations provided therefor in the horizontal legs of the side rails of said frame; longitudinal supporting-wires secured at their ends to the horizontal legs of said frame arranged over the cross-pieces thereof and under said spring supporting-wires; cross and longitudinal tie-wires for the tops of said springs; and an outer continuous frame wire to which the ends of said tie-wires are secured, for the purpose specified.

8. In a spring structure, the combination with the frame, comprising angle-iron side and end rails arranged with the angle outward and with the outer legs projecting upwardly, of cross-pieces secured to the inwardly projecting horizontal legs of the side pieces; double helically coiled springs arranged in rows; supporting-wires arranged in parallel pairs beneath the bottom coils of each row of springs and within their peripheries, said supporting wires having outwardly extending spring engaging hooks formed intermediate their lengths, said hooks being engaged over the bottom coil of each spring, the ends of said supporting-wires being engaged in suitable perforations provided therefor in the horizontal legs of the side rails of said frame; and longitudinal supporting-wires secured at their ends to the horizontal legs of said frame arranged over the cross-pieces thereof and under said spring supporting-wire, for the purpose specified.

9. In a spring structure, the combination with the frame, of cross-pieces for said frame; double helically coiled springs arranged in rows; supporting-wires arranged in parallel pairs beneath the bottom coils of each row of springs and within their peripheries, said supporting-wires having outwardly extending spring engaging hooks formed intermediate their lengths, said hooks being engaged over and clamped upon the bottom coil of each spring, the ends of said supporting-wires being engaged to said frame; longitudinal supporting-wires secured at their ends to the frame arranged over the cross-pieces thereof and under said spring supporting-wires; tie-wires arranged in parallel pairs corresponding to said pairs of supporting-wires having outwardly extending hooks formed intermediate their lengths, engaged over and clamped upon the top coils of each row of springs; longitudinal tie-wires arranged over the said cross tie-wires and above a longitudinal row of springs and secured to the top coils thereof by suitable clips; and an outer continuous frame-wire to which the ends of said cross and longitudinal tie-wires are secured, for the purpose specified.

10. In a spring structure, the combination with the frame, of double helically coiled springs arranged in rows; supporting-wires arranged in parallel pairs beneath the bottom coils of each row of springs and within their peripheries, said supporting-wires having outwardly extending spring engaging hooks formed intermediate their lengths, said hooks being engaged over and clamped upon the bottom coil of each spring, the ends of said supporting-wires being engaged to said frame; tie-wires arranged in parallel pairs corresponding to said pairs of supporting-wires having outwardly extending hooks formed intermediate their lengths, engaged over and clamped upon the top coils of each row of springs; longitudinal tie-wires arranged over the said cross tie-wires and above a longitudinal row of springs and secured to the top coils thereof by suitable clips; and an outer continuous frame-wire to which the ends of said cross and longitudinal tie-wires are secured, for the purpose specified.

11. In a spring structure, the combiantion with the frame, of cross-pieces for said frame; double helically coiled springs arranged in rows; supporting-wires arranged in parallel pairs beneath the bottom coils of each row of springs and within their peripheries, said supporting-wires having outwardly extending spring engaging hooks formed intermediate their lengths, said hooks being engaged over and clamped upon the bottom coil of each spring, the ends of said supporting wires being engaged to said frame; longitudinal supporting-wires secured at their ends to the frame arranged over the cross-pieces thereof and under said spring supporting-wires; tie-wires for the tops of said springs; and an outer continuous frame-wire to which the ends of said cross and longitudinal tie-wires are secured, for the purpose specified.

12. In a spring structure, the combination with the frame, of double helically coiled springs arranged in rows; supporting-wires arranged in parallel pairs beneath the bottom coils of each row of springs and within their peripheries, said supporting-wires having outwardly extending spring engaging hooks formed intermediate their lengths, said hooks being engaged over and clamped upon the bottom coil of said spring, the ends of said supporting-wires being engaged to said frame; tie-wires for the tops of said springs; and an outer continuous frame-wire to which the ends of said cross and longitudinal tie-wires are secured, for the purpose specified.

13. In a spring structure, the combination with a frame, comprising angle-iron side and end rails arranged with the angle outward and with the outer legs thereof projecting upwardly; angle-iron cross-pieces secured to the inwardly projecting horizontal legs of the side pieces arranged with their vertical legs projecting downwardly, said downwardly projecting legs of said cross-pieces having longitudinal slots therein; bed-rail engaging hooks adjustably secured to the said cross-pieces by bolts arranged through said slots therein; coiled springs arranged in rows; supporting-wires for said springs secured at their ends to the horizontal legs of said frame; cross and longitudinal tie-wires for the tops of said springs; and a continuous frame-wire to which the ends of said tie-wires are secured, for the purpose specified.

14. In a spring structure, the combination with a frame comprising angle-iron side and end rails arranged with the angle outward and with the outer legs thereof projecting upwardly, of angle-iron cross-pieces secured to the inwardly projecting horizontal legs of the side pieces arranged with their vertical legs projecting downwardly, said downwardly projecting legs of said cross-pieces having longitudinal slots therein; bed-rail engaging hooks adjustably secured to the said cross-pieces by bolts arranged through said slots therein; coiled springs arranged in rows; and supporting wires for said springs secured at their ends to the horizontal legs of said frame, for the purpose specified.

In witness whereof, I have hereunto set my hand and seal in the presence of two witnesses.

FRANK P. D'ARCY. [L. S.]

Witnesses:
OTIS A. EARL,
LULU GREENFIELD.