No. 813,923. PATENTED FEB. 27, 1906.

J. A. STAPLES.

SPRINGWORK.

APPLICATION FILED APR. 9, 1903.

2 SHEETS—SHEET 1.

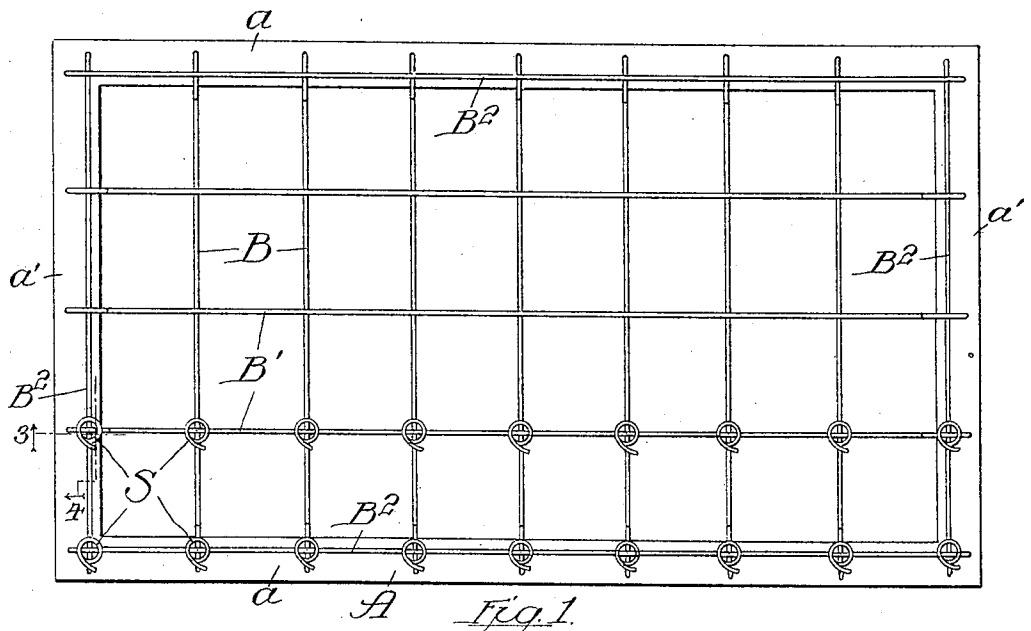


Fig. 1.

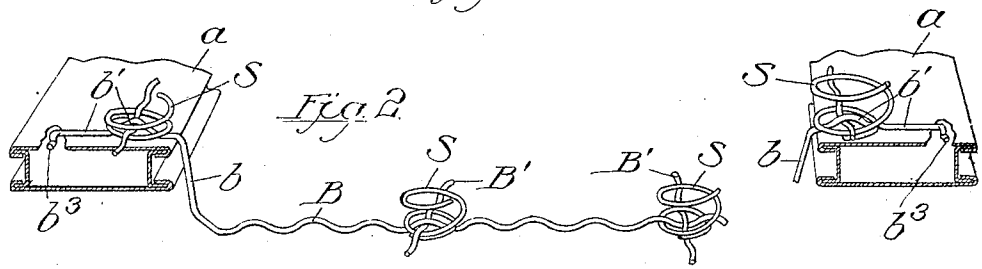


Fig. 2.

Fig. 3.

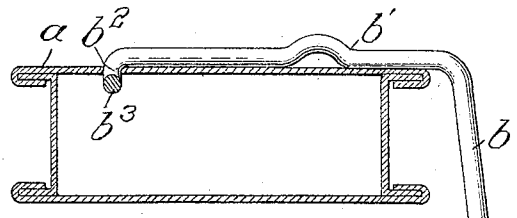
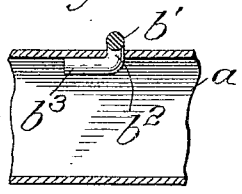


Fig. 4.





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2 SHEETS—SHEET 2.

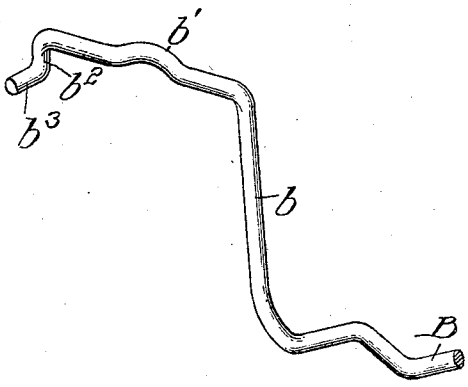


Fig. 5.

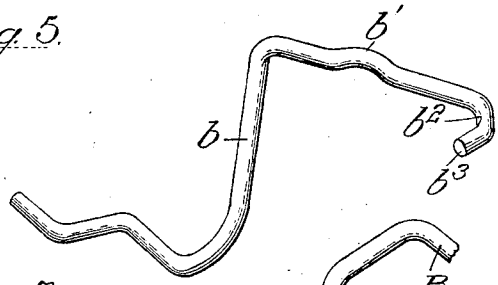


Fig. 6.

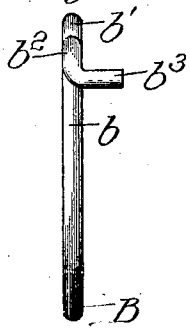


Fig. 7.

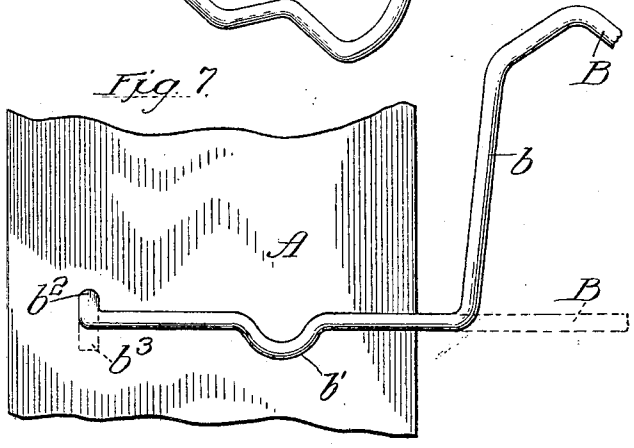


Fig. 8.

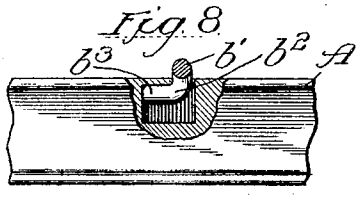
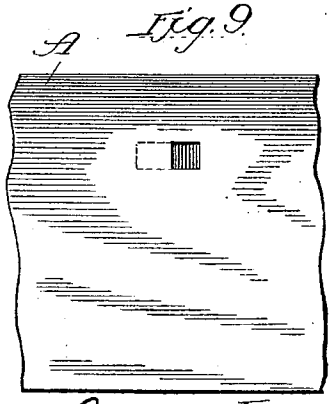


Fig. 9.



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UNITED STATES PATENT OFFICE.

JOHN A. STAPLES, OF NEWBURGH, NEW YORK, ASSIGNOR TO STAPLES & HANFORD COMPANY, OF NEWBURGH, NEW YORK, A CORPORATION OF NEW JERSEY.

SPRINGWORK.

No. 813,923. Specification of Letters Patent. Patented Feb. 27, 1906.

Application filed April 9, 1903. Serial No. 151,850.

To all whom it may concern:

Be it known that I, JOHN A. STAPLES, a citizen of the United States, residing at Newburgh, in the county of Orange and State of New York, have invented certain new and useful Improvements in Springwork, of which the following is a specification.

My invention relates to springwork; and its object is to provide certain improvements for use in spring organizations whereby the spring-supports are securely locked and fastened in place upon the frame with which they are associated.

The invention consists in the novel constructions and organizations of the parts hereinafter described, and pointed out in the appended claims.

In the accompanying drawings, which form a part of this specification, and which illustrate an exemplification of my invention in its preferred form, Figure 1 is a top plan view of a section of springwork constructed in accordance with my invention. Fig. 2 is a view in cross-section with parts broken away to show the details of construction and arrangement of the parts of Fig. 1. Fig. 3 is a sectional view on the line 3 3 of Fig. 1 looking in the direction of the arrow on this line. Fig. 4 is a sectional view on the line 4 4 of Fig. 1 looking in the direction of the arrow on this line. Fig. 5 is a detail perspective view of a wire hanger having my attaching means, the hanger being broken away at its center for convenience of illustration. Fig. 6 is an end view of the hanger of Fig. 5. Fig. 7 is a top view of a section of a rail of the frame and of an end of a hanger having my attaching means and showing in full lines the hanger in its initial position for assembling the same on the frame, the dotted lines indicating the positions which the parts of the hanger assume with relation to the frame when fully assembled or in its normal position; and Figs. 8 and 9 are detail sectional and top plan views of a section of a modified form of rail with my hangers attached.

Referring to the drawings, the reference-letter A represents the frame of a suitable spring structure—such, for example, as a bed-bottom or spring-mattress—composed of suitable side pieces *a* and end pieces *a'*. The component parts of the frame are suitable rails, preferably hollow and square in cross-section, in practice being approximately three inches wide and one inch high and suitably united at their corners by any well-known means.

The reference-letter S represents the springs, which are of any suitable spiral type and are arranged and disposed on the frame in as many rows or ranges, properly spaced apart, as may be necessary and desirable to give the required finish to the article designed. The lower ends of the springs are carried by suitable supports, as hereinafter more fully described, and the upper ends may be connected together to form a compact and rigid upper surface by any of the well-known forms of bracing or through wires or stays. In the drawings suitable springs are not shown in full outline, but for greater clearness and convenience of illustration are represented only by their lower ends.

The reference-letter B represents a suitable hanger, by which the coil-springs are supported, and which is adapted to interlock with the frame. In the preferred form each of these supports or hangers has a central portion, which is horizontal when the support is in place on the frame and which is approximately as long as the measurement of the opening of the frame. At each end of the central portion the support is bent upwardly to provide a drop, as at *b*, and beyond the drops the ends *b'* extend in the plane of the central portion and are finished off with or terminate in means for attachment to the rails of the frame, as hereinafter more fully described. The supports are thus preferably in the form of hanging or drop supports, and their central horizontal portions, which are normally within the opening of the frame when the parts are assembled, are formed with any suitable means for supporting the usual interior springs. The end portions *b'* are also provided with seats or rests for the springs of the edge rows where they rest on the upper surfaces of the frame, whereby a spring edge is produced as the springs of the edge rows when seated thereon will stand over the upper surface of the frame and their top coils will project out flush with or beyond the edges of the rails. For this purpose the end portions of the supports are made of suitable lengths, and seats or rests for the edge springs are provided therein in any suitable manner, preferably similar to those in the drop or central portions of the

supports. The springs of the edge rows are shorter than the springs of the interior rows, this difference in height being approximately equal to the depth of the drops b. The supports are preferably in the form of wires, and their end portions b' are provided with outer downturned hooks b^2, which terminate in wings or fingers or projections b^3, which are lateral to the supports and extend in the same direction. The rails of the frame are provided with holes or openings arranged to correspond with the location and disposition of the rows or ranges of springs, and forming seats for the ends of the drop wires B. The holes in the rails are arranged in pairs, each two holes, one opposite to the other in the two rails, forming the pair of seats for the ends of each supporting wire or hanger. When the hangers are to be assembled, the ends of the wings or fingers of each wire are simultaneously introduced into the selected pair of holes in the manner shown in full lines in Fig. 7 with the bends or drops b and the central portions horizontally disposed in the same plane, and the faces of the ends b' on the same side as the hooks resting upon the rails. When in this position, the ends b' will act as pivots upon which the wires may swing or rotate by gravity when released or by the direct manipulation of the operator down to their final positions, as indicated in dotted lines in Fig. 7, when the hooks b^2 enter the holes and the fingers or wings b^3 are turned up against the under surface of the upper face of the rail, as clearly shown in Figs. 3 and 4. In this position the supports are securely held and locked against displacement. It is obvious that the wings may be at any angle or inclination; but I prefer to arrange them at substantially right angles to the end portions, as then they come flush up against the inner face of the rail and are more rigidly held. The length of the hooks b^2 in practice will be approximately the thickness of the wall of the rail.

While I prefer to employ a hollow rail, it is obvious that other forms may be employed, and the seats may be provided in any suitable manner. For example, in Figs. 8 and 9 I show a solid rail having suitable seats provided by undercut openings. In practice I prefer a square hollow metallic rail; but it is obvious that the rails may be of any suitable size and shape and of any form and material. The rails may, if desired, be composed of thin flat strips, similar in outline to that shown in Fig. 7.

While I prefer to employ drop-wires of the form described, the material and form of the supports or hangers may of course be varied. For example, I may employ supports not having drops, for it is evident that if such supports or hangers be used and their bent ends simply inserted in the holes or seats of any suitable form of rail, such as the hollow or flat rail above mentioned, and then turned into vertical position, so as to interlock with the rails, they would provide suitable supports for all the springs, and the structure would be a flat bed-bottom with the springs of the edge rows and center rows of the same height. When wires are used, they may be corrugated or bent through their lengths or they may have eyes or bends at suitable intervals in the lines of the rows or ranges of springs. The springs may be supported directly upon the drop-wires in the seats provided by the bends or corrugations or the springs may rest directly upon supplemental cross-wires B′, which in turn rest upon and are supported by the drop-wires or the springs may rest directly upon both sets of wires at their points of crossing and may bind the wires together, as by interweaving therewith. Any arrangement and organization of this part of the device is within the scope of my invention, and the preferable form is that illustrated in Fig. 2, where the springs are rotated upon and interweave with the two sets of wires at their several points of crossing. In this form the bent or corrugated drop-wires B have their ends attached to the side rails in the manner above described, and the crossing wires B′, which preferably are of the same form as the wires B and are interlocked with the side rails, are then assembled upon the frame in the same manner as the wires B. When the crossing wires B′ are thus assembled, they rest upon the wires B in corrugations or bends thereof, one crossing wire B′ in the longitudinal line of each row or range or springs, and the springs are connected to the wires at their crossing points by rotating the springs to interweave their reduced lower coils with the seats formed by the corrugated or bent wires in the manner now well understood. The same seats will preferably be employed for the springs of the edge rows, these springs being assembled on the end portions b' in conjunction with brace-wires B^2 in the same manner as the interior springs are secured, the wires B^2, however, merely being suitable lengths without the end-locking means.

By means of interlocking connections between the metallic rails and spring-supports, it is obvious that a unitary metallic structure may be provided by the manufacturer which may be easily and readily assembled at the factory and may be shipped ready for use. Without interlocking connections the supports cannot readily be united to the metallic rails to form a unitary structure without the employment of some auxiliary and independent means, since the ends cannot be driven into the metal rails as they can into the wooden rails. By providing coacting crossing wires having interlocking rail connections the springs connecting the wires at their crossing-points bind them securely in

place, so that the entire springwork forms a unitary metallic structure. On the other hand, the materials may be furnished by the manufacturer in knockdown form, so as to be compactly packed for shipment, and the connections between the parts are so simple and readily made that they may be assembled by unskilled laborers.

Having described my invention, I claim—

1. A spring structure consisting of horizontal rails having permanent seats, spring-supports having angular ends adapted to be passed through said seats and interlocked with said rails, and springs carried by the supports.

2. A spring structure consisting of horizontal rails having seats, wires for supporting the springs and having angular ends entering the seats and lateral wings loosely engaging the rails, and springs on the wires.

3. In springwork, the combination with a frame having side rails provided with oppositely-disposed seats, drop-wires adapted when partially rotated to interlock with said seats, crossing wires arranged at intervals, and springs adapted to connect with both said wires at their points of crossing.

4. In springwork, the combination with a frame having side rails provided with oppositely-arranged holes, drop-wires having their ends bent to provide lateral wings adapted to said holes and to engage the under face of the rails, crossing wires arranged at intervals, and springs adapted to interweave with said wires at their crossings.

5. A spring-support to engage the frame of springwork, consisting of a wire having vertical end hooks which terminate in wings lateral to the length of the wire and extending in the same direction.

6. In springwork, a pair of horizontal rails having holes, and a spring-support consisting of a wire having substantially vertical end hooks adapted to the holes and whose length is approximately the thickness of the wall of the rail, and lateral wings adapted to react against the rails.

7. In springwork, the combination with a frame composed of rails provided with oppositely-arranged holes, spring-supports composed of crossing wires adapted to said holes and having lateral wings to pass within the holes and out of register therewith, and springs connecting said wires at their crossings.

8. In springwork, the combination with a frame composed of hollow metallic rails provided with oppositely-arranged holes, spring-supports composed of corrugated crossing wires, the ends of said wires having hooks adapted to rest in said holes and lateral wings adapted to prevent displacement thereof, and springs interwoven with said wires at their crossings.

9. In springwork, a pair of horizontal rails having opposite seats, and a spring-support consisting of a wire having ends entering the seats and provided with lateral wings engaging the rails.

10. In springwork, a pair of rails having opposite holes, and a spring-support having angular ends adapted when the support is partially rotated to enter said holes and interlock with the rails.

11. In springwork, the combination with a pair of rails having opposite openings, and a spring-support provided at its ends with wings lateral to the said support and adapted to the openings and engaged therewith by partial rotation of the support.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN A. STAPLES.

Witnesses:

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ALEX D. DARRAGH.