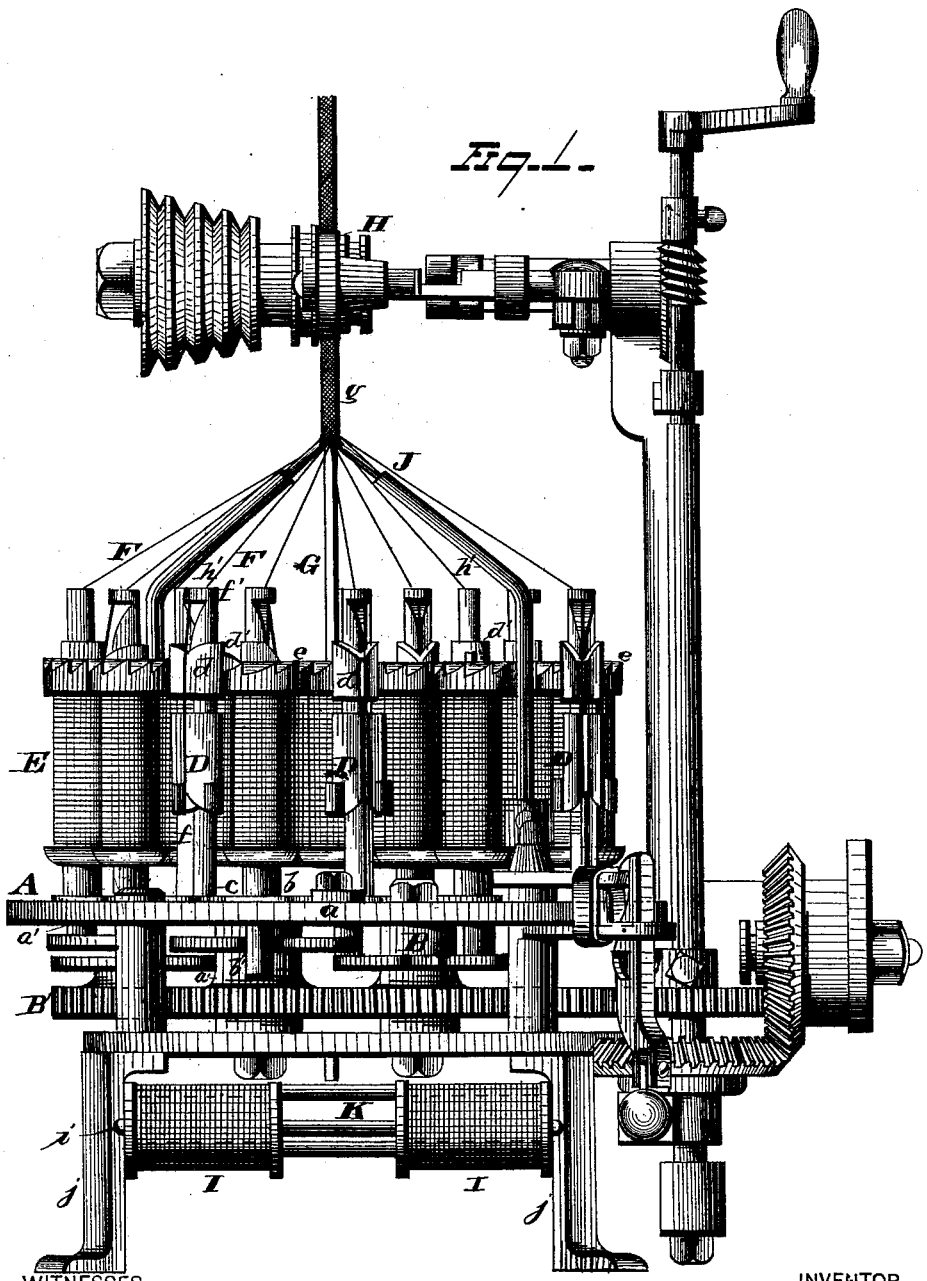
3 Sheets—Sheet 1.

A. BENJAMIN.

BRAIDED HOOP-SKIRT SPRINGS AND MACHINES FOR SAME.

No. 191,641. Patented June 5, 1877.

Fig. 1.



WITNESSES

Ed. L. Nottingham,

A. V. Bright.

INVENTOR

A. Benjamin

By H. A. Seymour.

ATTORNEY

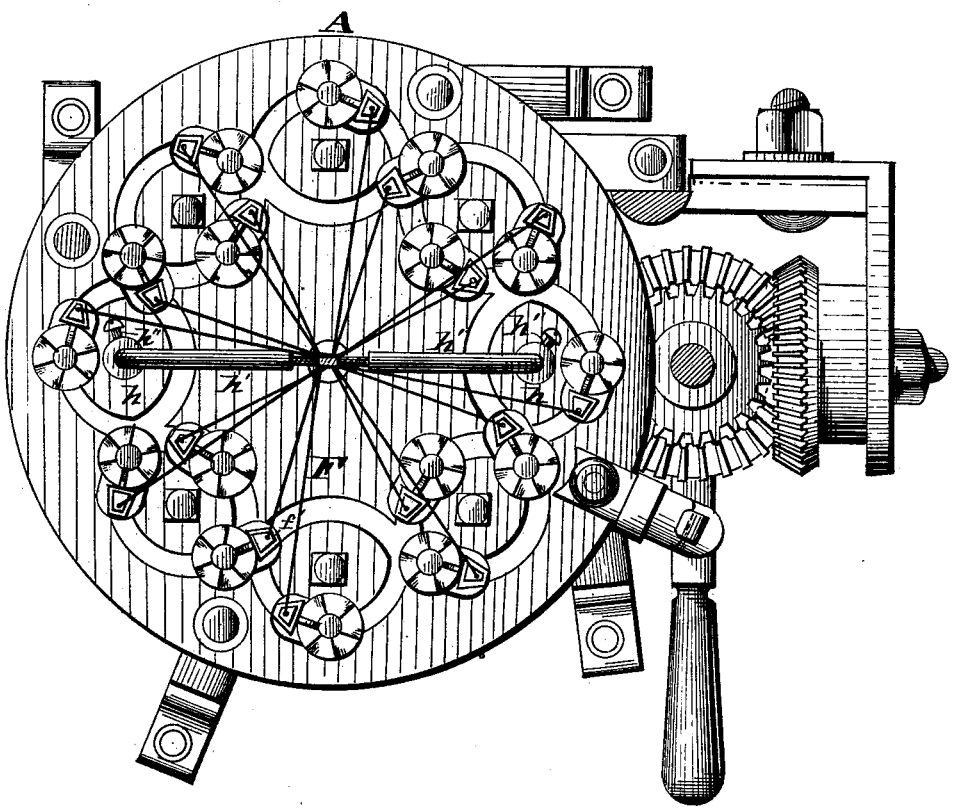
3 Sheets—Sheet 2.

A. BENJAMIN.

BRAIDED HOOP-SKIRT SPRINGS AND MACHINES FOR SAME.

No. 191,641. Patented June 5, 1877.

Fig. 2.



WITNESSES

Ed. D. Arthughaus

A. Wright.

INVENTOR

A Benjamin.

By H. A. Seymour.

ATTORNEY

3 Sheets—Sheet 3.

A. BENJAMIN.

BRAIDED HOOP-SKIRT SPRINGS AND MACHINES FOR SAME.

No. 191,641. Patented June 5, 1877.

Fig. 3

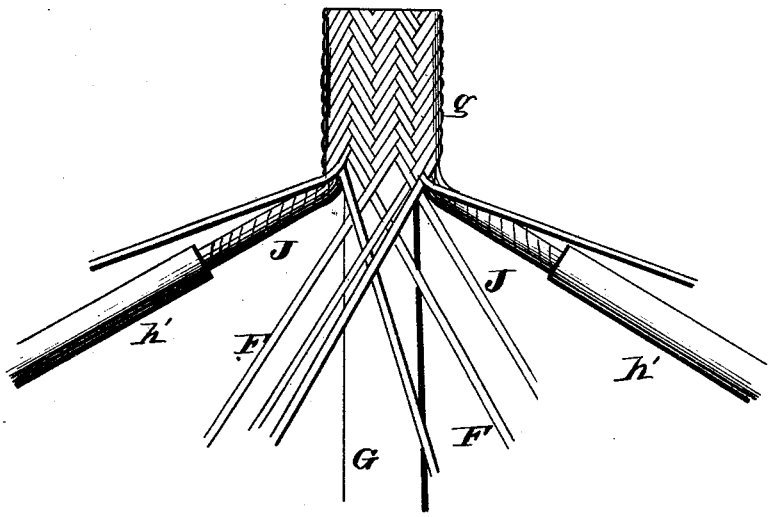
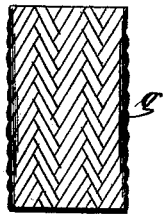


Fig. 4.



WITNESSES

Ed. L. Nottingham

A. W. Bright.

INVENTOR

A. Benjamin.

By H. A. Seymour.

ATTORNEY

UNITED STATES PATENT OFFICE.

ALFRED BENJAMIN, OF NEW YORK, N. Y.

IMPROVEMENT IN BRAIDED HOOP-SKIRT SPRINGS AND MACHINES FOR SAME.

Specification forming part of Letters Patent No. **191,641**, dated June 5, 1877; application filed March 29, 1877.

To all whom it may concern:

Be it known that I, ALFRED BENJAMIN, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Braided Hoop-Skirt Springs and Machine for same; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in braided hoop-skirt springs and machine for braiding the same.

The object of this invention is, first, to provide a braided hoop-skirt spring with flexible or yielding edge or edges, whereby the edges of the spring may be sewed directly to the material to which it is to be attached; second, to provide a braiding-machine with proper attachments to automatically feed a cord to one or both edges of the spring, said feeding mechanism to be arranged, relatively to the threads, so that the threads will pass around the outer surface of the cords and between the latter and the edges of the spring, and thus effectually secure the cords in place; and to this end my invention consists, first, In the combination with a braiding-machine of one or more guides consisting of tubes having their upper ends bent on approximately the same angle of the several threads leading from the bobbins to the spring, the upper end of the tubes extending nearly to a line passing through the center of the table of the machine, and arranged relatively to the spools of the machine in such a manner that the threads will pass around the cords and between the cords and edges of the spring, thereby operating to secure the cord or cords to the edge or edges of the spring in an effectual manner; second, in a braided hoop-skirt spring having one or both of its edges provided with a cord secured thereto by the threads passing around the outer surface of the cord and between the cord and edge of the spring, whereby the spring is adapted to be sewed through its edge or edges to any desired material or article and secured without the aid of clasps or spangles.

In the drawings, Fig. 1 represents a side elevation of a braiding-machine provided with my improvement. Fig. 2 is a plan view of the same, and Fig. 3 is an enlarged view of the spring, showing the course taken by the threads in securing the cord to the edges of the spring. Fig. 4 represents the completed hoop-skirt spring.

A represents an ordinary braiding-machine employed in braiding flat and round wire hoop-skirt springs. The machine represented in the drawings is furnished with sixteen spools, but the number of spools may be increased or diminished, at pleasure, and still accomplish the desired result. The table *a* is provided with zigzag grooves, within which are situated the guides *a'* of the spindles *b*, which latter serve to support the spools. Guides *a'* are situated within the notches *b'* of the carriers B, the latter being rotated by gears B'. Tension-weight guides are combined with the base-plates *c* to which the spindles *b* are secured, said guides carrying the usual tension-weights D and check-weights *d*, the latter being provided with an arm, *d'*, which engages with the ratchet-teeth *e* of spools E. Threads F are taken from the spools and passed through thread-eye *f* in guides down beneath the lower edge of the tension-weights D and upwardly through the eyes *f'*, in guides, and from thence to the flat or round spring to be braided. The unbraided portion of spring G passes down through an opening in the center of table *a*, and is wound on a reel, not shown in the drawings. The upper and braided portion *g* of the spring passes through friction feed-rolls H, which latter operate in a well-known manner to automatically feed the spring upwardly to be braided.

On opposite sides of the table *a* are secured the tubular standards *h*, to which the tubular feed-tubes *h'* are removably attached by means of set-screws *h''*. Feed-tubes *h'* extend upwardly in a vertical direction to about the height of the guides, where they are curved to an angle of about forty-five degrees, and extend to within a short distance of the edges of the flat spring to be braided. The upper ends of the tubes *h'* are made with smooth outer surfaces and as small as posssible, and

still allow sufficient space within the same for the free travel of the cords.

Spools I, having cords J, of any desired size, wound thereon, are placed on a suitable bearing, *i*, attached to the legs *j* or any other portion of the machine below the table *a*. Cords J extend beneath the machine to the side opposite the spools, where they are passed through tension-bars K, which latter may be provided with any desired means for adjustment. It is evident that any suitable tension-regulating device may be used in lieu of the bars K. The cords then pass from bars K backwardly beneath the machine and up through the tubular standards *h* into and through the feed-tubes *h'*, and by means of which they are delivered to the edges of the spring.

The tubular standards, having the feed-tubes *h'* secured thereto, are centrally located between the curved grooves within which the spool-guides travel as the spools are rotated in reverse directions around the table, and thus one-half the number of spools travel around the outer side of the feed-tube and the other half travel around the inner side of of the same. The course taken by the threads of the different spools is clearly shown in Figs. 2 and 3. One-half the number of threads employed pass over the feed-tubes, and consequently pass over or around the cords, and thus serve to bind the cord securely to the spring. The other threads pass beneath the feed-tubes and between the cord and edge of the spring, thereby operating not only to bind the cords to the spring, but to locate and confine the cords to the edge or edges of the spring and prevent any displacement of the cords after the operation of braiding the spring has been completed. The feed-tubes perform an important office in causing the braid to be formed in close proximity to the spring and thereby form an even and regular braided surface around the cord as it is delivered to the edge of the spring.

The spring, after being braided in the manner above set forth, is starched and ironed in the ordinary manner.

Heretofore the springs often become disengaged from the skirt, owing to the accidental detachment of the clasps or spangles, which latter are continually catching on other portions of a lady's wearing apparel, and thus occasion much trouble to the wearer, and render it a matter of considerable difficulty and annoyance to again secure the springs in place.

Springs braided in accordance with my invention possess many advantages over the ordinary spring, the principal and main excellence of this form of construction being that the spring may be secured to the fabric of a hoop-skirt by sewing through the corded edges, and this is accomplished by machine-sewing. This fact alone constitutes a great advance in this class of manufactures, as all clasps and spangles which are now employed for securing the springs to the skirts are dispensed with.

I contemplate the manufacture of corset-springs in the manner above described, the process differing only in matters of detail from the one set forth.

I am aware that braiding-machines have been constructed with feed-tubes extending to about the height of the bobbins and without an angular upper extension, and such construction I do not claim; but

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

1. The combination with a braiding-machine of one or more feed-tubes located between the reversely-traveling spools, said tubes extending upwardly in a vertical direction to about the height of the spindles, and then projecting inwardly on an angle, substantially the same as that assumed by the threads, nearly to the spring to be braided, substantially as and for the purpose set forth.

2. As a new article of manufacture, a braid-covered metallic spring provided with a corded edge or edges of sufficient width to allow of the braid-covered spring being secured by sewing through such corded edge or edges, substantially as shown and described.

In testimony that I claim the foregoing, I have hereunto set my hand and seal this 19th day of March, 1877.

ALFRED BENJAMIN. [L. S.]

Witnesses:
NELSON CRAWFORD,
C. A. GODLEY.