

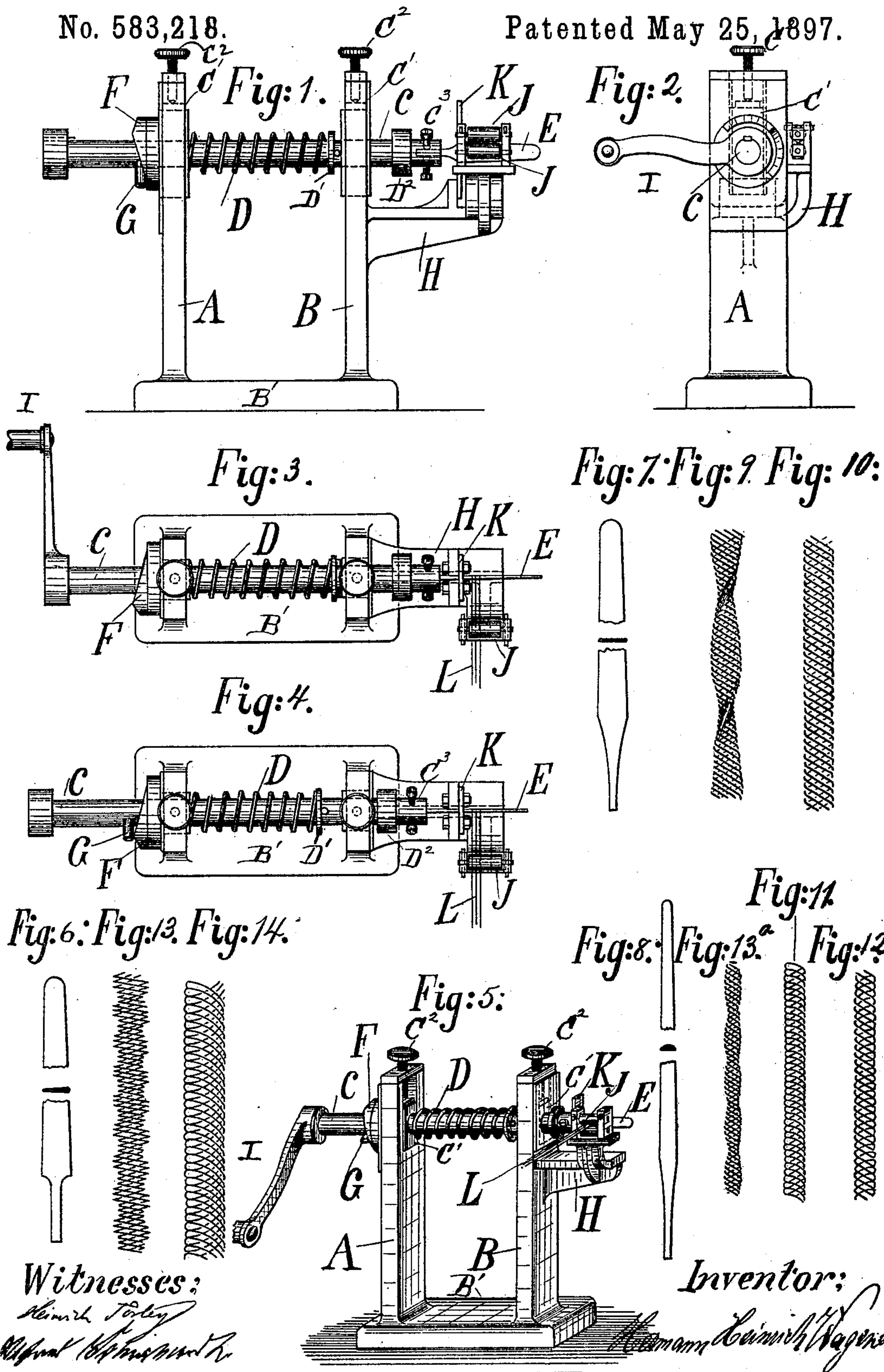
(No Model.)

H. H. WAGENER.

# MACHINE FOR MAKING FLAT WIRE SPRINGS.

No. 583,218.

Patented May 25, 1897.





# UNITED STATES PATENT OFFICE.

HERMANN HEINRICH WAGENER, OF CASSEL, GERMANY.

## MACHINE FOR MAKING FLAT-WIRE SPRINGS.

SPECIFICATION forming part of Letters Patent No. 583,218, dated May 25, 1897.

Application filed September 27, 1895. Serial No. 563,825. (No model.) Patented in Germany April 6, 1895, No. 91,374; in Belgium August 10, 1895, No. 116,709; in Austria September 2, 1895, No. 45/3,101; in Italy September 6, 1895, No. 39,471; in England November 16, 1895, No. 14,099, and in France November 22, 1895, No. 249,186.

*To all whom it may concern:*

Be it known that I, HERMANN HEINRICH WAGENER, manufacturer, a subject of the German Emperor, residing at Cassel, Province of Hessen-Nassau, Germany, have invented a new and useful Improvement in Machines for Making Flat-Wire Springs for Articles of Apparel, (for which I have received Letters Patent in the following countries: Austria, September 2, 1895, No. 45/3,101; Italy, September 6, 1895, No. 39,471; France, November 22, 1895, No. 249,186; Belgium, August 10, 1895, No. 116,709; England, November 16, 1895, No. 14,099, and Germany, April 6, 1895, No. 91,374,) of which the following is a specification.

This invention relates to machines used in making flat-wire springs having a braided appearance and adapted to be used instead of whalebones for stiffening corsets, waists, and other articles of feminine apparel.

The said invention consists in the construction and combination of parts hereinafter particularly set forth and claimed.

In the accompanying drawings, Figure 1 represents a side elevation of a machine embodying my invention. Fig. 2 represents an end elevation of the same. Figs. 3 and 4 represent plan views of the same in different positions of the mechanism. Fig. 5 represents a perspective view of the same. Figs. 6, 7, and 8 represent detail views of slightly-different forms of the mandrel. Figs. 9, 10, 11, 12, 13, 13<sup>a</sup>, and 14 represent specimens of the product.

A and B represent a pair of standards raised on a base B' and provided with bearings C' for the mandrel-shaft C. These bearings are held in place by screws C<sup>2</sup>. A spring D, wound helically about the said shaft and bearing at one end against a fixed collar D' thereon, while at the other end it bears against standard A, forces the operative end of the said shaft outward. This end is provided with a socket C<sup>3</sup>, which receives and holds the mandrel E, preferably of flat form, somewhat like that of an ordinary flat file, as shown in Fig. 7; for example, though this may manifestly be varied considerably. The other end of the said shaft is provided with a crank-handle I

for rotating it. The said shaft is also provided with a radial stud G between the said crank-handle and standard A, and this turns in contact with a fixed cam F, attached to the standard A. The operation of the said cam and the opposing spring D causes a continual rapid longitudinal reciprocation of the said shaft as the latter rotates. This is limited by the collar D' aforesaid and by another fixed collar D<sup>2</sup> on the said shaft between the standard B and the socket C<sup>3</sup>. Of course the mandrel E partakes of the reciprocating as well as of the rotary motion of its shaft.

H designates a bracket which is rigid with the standard B and extends outward rigidly therefrom, supporting a pair of horizontal feeding-rolls J, which are arranged parallel to the said mandrel. A stripping-plate K, also supported on the said bracket, allows the said mandrel to play backward and forward through an opening in it, but catches the coils of the wire L and strips them from the said mandrel as the latter is withdrawn.

In practice the several strands of wire are passed between the said rollers and wound once or twice about the said mandrel to give them a hold thereon. The crank-shaft I is then turned, and the combined rotary and reciprocating motion of the shaft C and mandrel E causes the wires to be wound obliquely thereon in an open-work tube having the general appearance of being braided, while the plate K forces the said wire tube from the machine as fast as produced. This tube is then flattened by pressure in any convenient way and cut into such lengths as are needed.

The exact form of the product will depend on the form of the mandrel. For greater stiffness it may of course be twisted, as shown in Fig. 9. The rolls J insure the proper presentation of the wires and a sufficient degree of tension.

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

1. The combination of a rotating and reciprocating mandrel E, with a fixed stripping-plate through which it works, a pair of rolls arranged in proximity to the said mandrel, and mechanism for causing the aforesaid mo-

tions of the said mandrel, the said plate being arranged and adapted to remove the wire open-work tube therefrom as it is formed on the said mandrel ready for flattening, substantially as set forth.

2. The shaft C provided with means for communicating motion thereto and also with a stud G and collars D' and D<sup>2</sup>, in combination with a spring D acting against the collar D',  
10 a cam F in contact with the said stud and operating in combination with the said spring

to cause the reciprocation of the said shaft, a mandrel E mounted on the end of the latter, a pair of rolls J arranged in proximity to the said mandrel, and a fixed stripping-plate 15 K through which the said mandrel plays, substantially as and for the purpose set forth.

HERMANN HEINRICH WAGENER. [L. S.]

Witnesses:

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