

D. A. COBB.

MEANS FOR IMPARTING HELICAL FORMS TO WIRE.

No. 573,763.

Patented Dec. 22, 1896.

Fig. 1.

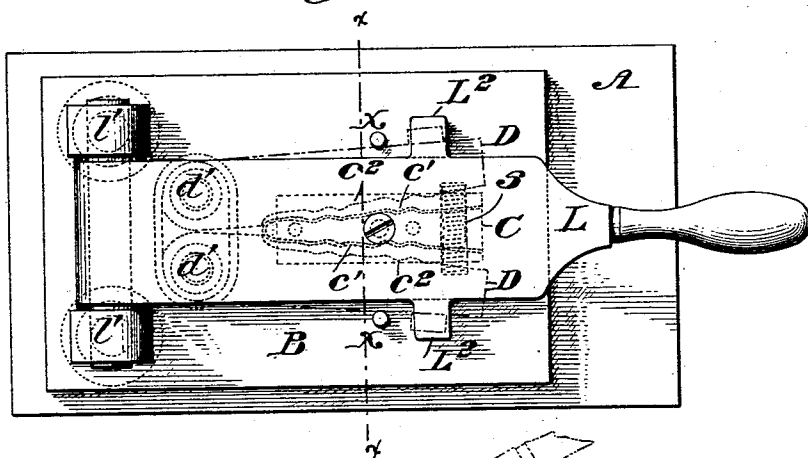


Fig. 2.

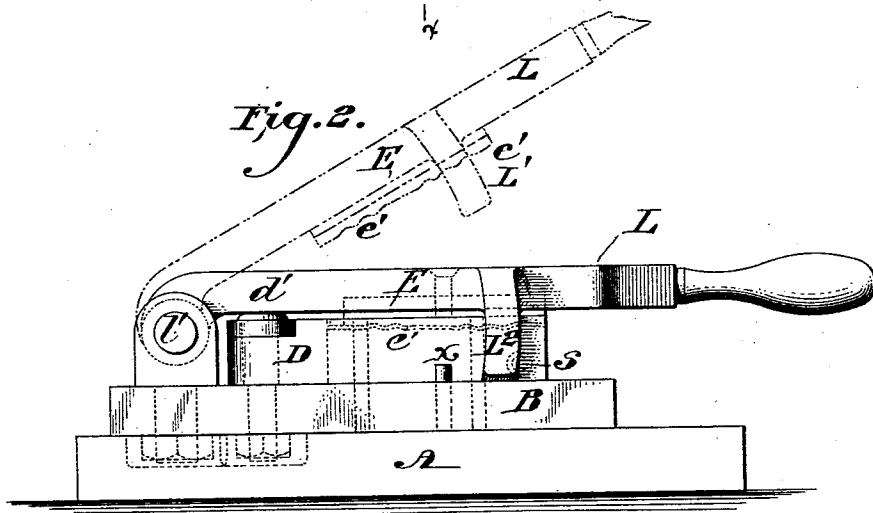


Fig. 5.
e² e²
h F h₀

Witnesses:
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H. Alford Boggs.

Inventor:
Dewey A. Cobb
per his attorney,
Joshua Pusey.

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Fig. 3.

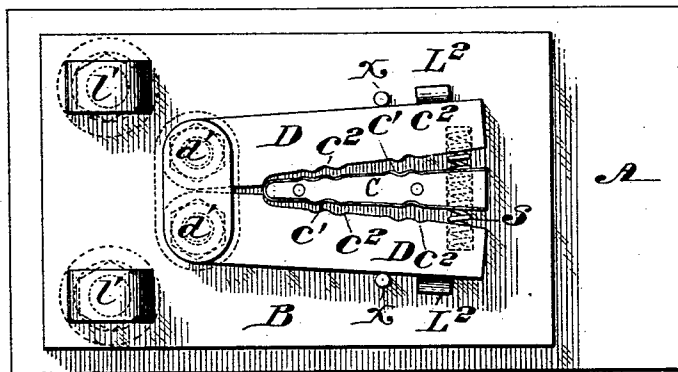


Fig. 4.

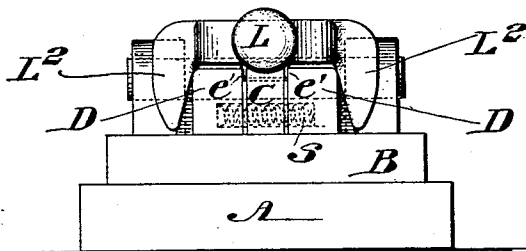


Fig. 7.

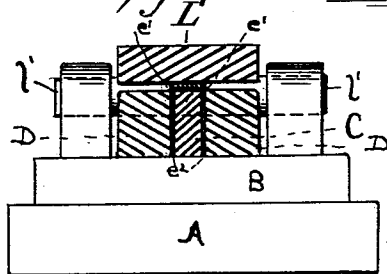
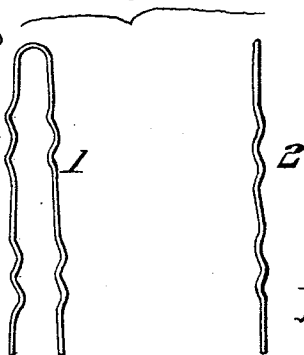


Fig. 6.



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UNITED STATES PATENT OFFICE.

DEWEY A. COBB, OF PHILADELPHIA, PENNSYLVANIA.

MEANS FOR IMPARTING HELICAL FORMS TO WIRE.

SPECIFICATION forming part of Letters Patent No. 573,763, dated December 22, 1896.

Application filed October 24, 1892. Serial No. 449,876. (No model.)

To all whom it may concern:

Be it known that I, DEWEY A. COBB, a citizen of the United States, residing at the city and county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Means for Imparting Helical Forms to Wire, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, of which—

Figure 1 is a plan view; Fig. 2, a side elevation; Fig. 3, a plan view with lever detached; Fig. 4, a rear end elevation; Fig. 5, a side elevation of core-plate F detached; Fig. 6, an elevation (1) and side view, (2,) respectively, of a hair-pin made by the machine. Fig. 7 is a cross-section on the line xx , Fig. 1.

This invention has relation to means for imparting to wire, in whole or in part, the form of an elongated helix, such, for example, as the hair-pin shown and described in Letters Patent No. 395,582, granted January 1, 1889, to W. F. Peet.

The essential features of the mechanism for carrying out the invention consist of suitable dies or compression devices adapted and arranged to move in substantially horizontal and vertical directions, respectively, whereby the straight shanks of an ordinary hair-pin are forced into the desired helical form in lieu of the usual manner of forming helices by turning the wire around a mandrel, which latter method is impracticable in the manufacture of hair-pins of the class referred to, owing to its cost.

The invention further consists in certain combinations and details of construction which will be duly pointed out.

Although I do not confine myself to the process and construction hereinafter described, I shall explain that construction which I have employed with practical success.

Referring to the annexed drawings, A is the base of the machine, upon which rests a plate B. C is a core secured to this plate, the sides of the upper part of which are shaped or cut out so as to form the lateral bends of a die c' , corresponding with those of the hair-pin, as seen in Fig. 6' and as

shown in Fig. 3 and by the dotted lines in Fig. 1.

D D are two lateral die-arms pivoted on bolts d' , secured to base-plate B and adapted to swing horizontally to and from core C. They are maintained normally away from the core by means of a spiral spring S passing through the core and pressing against the sides of the die-arms. The outward throw of these is limited by stop-pins x . The upper inner edge of each of these arms is provided with a die c^2 , with bends complementary to the bends of the core-dies c' , that is to say, the outward bends of the one register with the inward bends of the other when the parts are brought into juxtaposition, as follows: L is a hand-lever journaled in bearings l' on the front end of plate B. Its rear end is provided with depending lugs L^2 , that are flared outwardly on the inner side, and are so disposed that when the lever is suitably depressed these flaring sides of the lugs impinging against the outer edges or corners of the die-arms D will force the latter inwardly toward, and finally in contact with, the core.

On the under side of lever L are two plates E, whose distance apart corresponds to the width of core C. The lower edges of each of these plates are shaped, as shown, to form a die e' , which, in conjunction with a complementary die e^2 at the sides of the core, is adapted to give the vertical bends to the shanks of the hair-pin. These latter dies consist of a steel plate F, (shown detached in Fig. 5,) having its upper edge suitably shaped, as shown. These plates are fastened by means of screws passing through holes h on a plate on each side of the core, as seen in Fig. 5 and indicated by the dotted lines in Fig. 2. These dies may, however, form an integral part of the core, being then cut out from the upper edge of the sides of the same. It is, however, more convenient and economical to make them of a steel plate, as described, which may also be renewed when worn out.

Having thus described the construction and relation of the parts of the machine, I shall now explain the mode of operation, which is as follows: The lever L being elevated, as indicated by the dotted lines in Fig. 2, an ordinary straight-shank hair-pin is

placed over the sides of the suitably-tapered core C, resting upon the tops of the plates or dies $F e^2$. At this time the die-arms D stand away from the core by reason of the stress of
 5 spring S. The lever is now forcibly depressed, whereupon by the action of its cam-lugs L^2 pressing against the edges of the arms D it forces the latter inwardly and so compresses the shanks of the pin laterally between the dies c' and c^2 . At the same instant the downwardly-moving die $E e'$ compresses the shanks vertically in conjunction with the die e^2 of the plate F. Thus the several correspondent dies cooperating impart
 10 to the hair-pin the elongated spiral form or such portions of the length of the same as may have been predetermined. The lever being again raised, the spring-impelled arms D will move away from the core, and the pin may then be removed and the operation repeated.

It will be observed that this invention is an embodiment of the proposition that if a straight wire be carried simultaneously to
 25 four equidistant points situated on the periphery or circumference of the helix to be formed and leading in the exact direction it would occupy in the finished helix the intermediate portions will, by the laws governing the bending of a body of uniform resistance, take their proper direction in the helix.

In the machine above described the four die portions at each side compress the wire at four points in that portion thereof forming each whirl of the finished helix and bend or
 35 carry it to the four-equidistant points on the periphery or circumference of the finished whirl, which divide it into equal parts. These bends or compressions being made simultaneously, the intermediate portions of the wire assume the proper position in the finished helix. By the employment of the hinged dies the compression is made gradual from one end of the wire toward the other, providing for the intaking of the necessary
 40 extra wire required for the helix.

It will be seen upon analysis of the essential construction and mode of operation of my invention that it is the alternating salient
 50 points or "projections" of the dies, as I have termed them, toward the interposed wire that do the bending of the latter, and whereby, as before described, the wire is, so to say, compelled to take the desired helical form by reason of the substantially simultaneous operation or coaction of the several series of said points or projections. Such alternating or complementary lines or series of concrete points or projections—two lines operating to
 55 impinge against and so bend the wire in one plane and the other two lines in a plane substantially at right angles to the other plane, whereby a piece of wire is made to take twist or helical form through what may be termed
 65 "compression"—bending, as contradistinguished from the usual methods of turning the wire on a mandrel, or of twisting the wire,

are the essence of my invention and that in which its novelty, broadly considered, consists.

In the making of small wire articles (such, for example, as the patented hair-pin hereinbefore referred to, which has reverse spirals on each shank) that must be made very cheaply to be at all salable in the market
 75 my invention is especially useful, for it will be obvious to those skilled in the art of wire-working that the cost of producing the spirals or twists will be very much less by a machine of devices operating upon the principle
 80 of my invention, wherein the result is attained by, in effect, a single and quick movement or impulse, than by the comparatively slow means or method heretofore employed.

Although I have shown a hand-operated
 85 mechanism, the same may be adapted by any skilled mechanic to be operated by foot or other power, and the pins may be fed into position by means of automatic mechanism.

I do not limit myself to the form and combination hereinbefore described, as the parts
 90 may be modified in various ways without departing from the essential or broad principle of the invention.

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

1. In a machine for imparting helical form to wire, the following essential elements in combination, a series or row of projections or
 100 bending devices, a second series or row of projections or bending devices alternating with or complementary to the said first series, a third series or row of projections or bending devices, a fourth series or row of projections or bending devices alternating with or
 105 complementary to said third series, means for supporting the said several series, and means whereby the said several series are caused to substantially simultaneously impinge upon
 110 an interposed straight wire to effect a sinuous bending thereof in two planes at right angles to each other and thereby cause it to take a helical form, substantially as specified.

2. In a machine for imparting helical form
 115 to wire, a compression device having coacting jaw or die portions between which the wire to be operated upon is interposed, and which are provided on their inner or working faces with a plurality of projections or bending devices arranged in four longitudinal
 120 lines or series projecting toward the wire in different directions, whereby when brought into forcible contact with said wire they effect therein a sinuous bending thereof in
 125 planes at right angles to each other and thereby cause it to take a helical form, in combination with means for actuating said jaw or die portions to effect such bending in a substantially simultaneous manner, substantially
 130 as specified.

3. In a machine for imparting helical form to wire, the combination of compression devices for effecting sinuous bendings of the

wire in one plane, compression devices for effecting similar bendings in a plane at right angles to the first plane, and means for operating the said compression devices substantially simultaneously for the purposes set forth.

4. In a machine for the purpose recited, the combination of the fixed core having the vertical and lateral die portions, the pivoted side arms having the die portions to cooperate with the lateral die portions of the core, the pivoted lever having the die portions to cooperate with the vertical die portions of the core and the flaring lugs to engage and actuate the side arms, all constructed to operate substantially as and for the purpose specified.

5. In a machine for imparting helical forms to the shanks of hair-pins &c. the combination with a fixed part or core provided with vertical and lateral die portions, of laterally and vertically movable parts having each die portions which are complementary to the respective cooperating portions of said fixed part or core, and means for simultaneously actuating said movable parts, substantially as specified.

6. In a machine for imparting helical form to wire, the combination of two sets of complementary bending or compression devices arranged to act upon a piece of wire at four points on each portion thereof which is to form one whirl of the completed helix to bend or carry it to the four equidistant points on the periphery or circumference of the finished

whirl which divide it into equal parts, together with means for causing the coacting movement or operation of said device, substantially as specified.

7. In a machine for imparting helical form to wire, the combination of two sets of complementary bending or compression devices arranged to act upon the wire at four points on each portion thereof which is to form one whirl of the finished helix to bend or carry it to the four equidistant points on the periphery of the finished whirl which divide it into equal parts, together with means for causing a coacting movement of said devices, the latter being also arranged to effect the bending for each whirl substantially simultaneously but gradually from one end of the wire toward the other, substantially as specified.

8. The combination with a pair of compression-dies arranged to act upon a piece of wire to bend it into sinuous form in one plane, of a second pair of dies arranged to effect a similar bend in a plane perpendicular to the first and at points intermediate thereof, and means for simultaneously actuating said pair of dies, substantially as specified.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

DEWEY A. COBB.

Witnesses:

JOHN R. NOLAN,
WALTER C. PUSEY.