

(No Model.)

C. H. MILLER.  
WATCHMAKER'S TOOL.

No. 477,432.

Patented June 21, 1892.

Fig. 2.

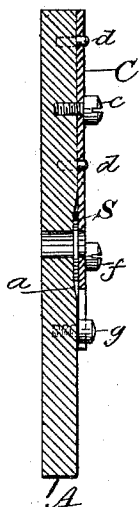


Fig. 1.

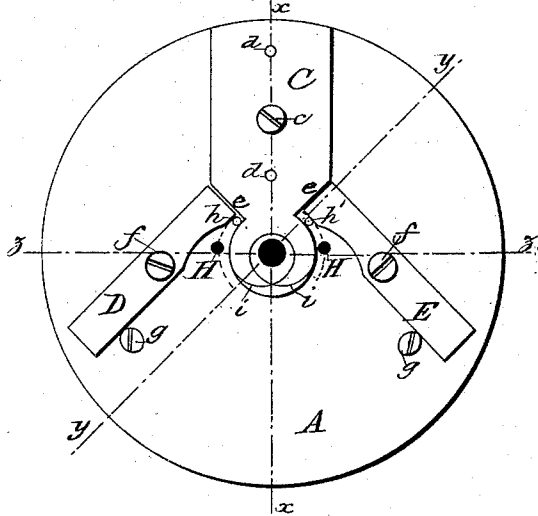


Fig. 3.

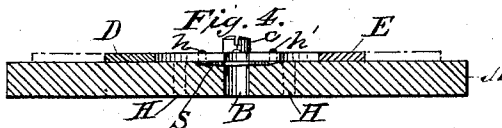
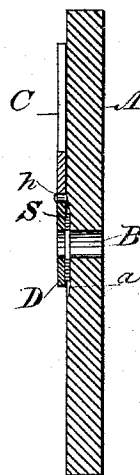


Fig. 5.

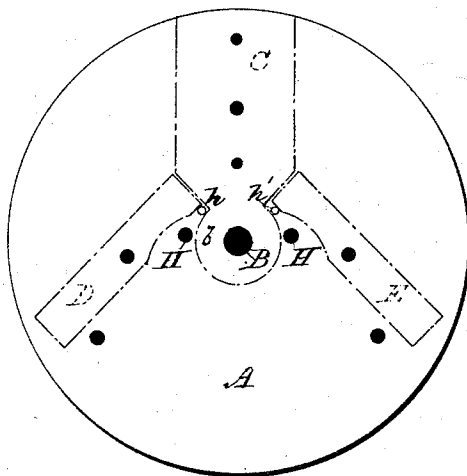


Fig. 7.

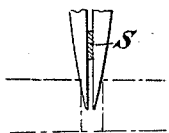


Fig. 8.



Witnesses:

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Charles H. Miller,

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# UNITED STATES PATENT OFFICE.

CHARLES H. MILLER, OF ROCKFORD, ILLINOIS.

## WATCHMAKER'S TOOL.

SPECIFICATION forming part of Letters Patent No. 477,432, dated June 21, 1892.

Application filed July 15, 1890. Renewed October 5, 1891. Serial No. 407,678. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES H. MILLER, a citizen of the United States, residing at Rockford, in the State of Illinois, have invented a new and useful tool to be used in forming and bending up the over-coil or terminal curve in watch balance-springs or in forming what are commonly termed "Brequet" springs, of which the following is the specification.

My invention relates to watchmakers' tools used for forming and bending the over-coil or terminal curve of the balance-springs for watches; and the object of the invention is to produce a tool by which the over-coil or terminal curve of balance-springs, or what is termed "Brequet" springs, can be bent and formed in an easy and expeditious manner; also, to produce a tool that can be easily adjusted to suit different kinds of balance-springs and form their over-coil, and finally to form the over-coil for right or left hand springs with one and the same tool.

To this end my invention consists in the construction of certain details and arrangement of parts, as will be more fully described hereinafter, and specifically pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is a plan or front view of the improved tool. Fig. 2 is a cross-section on line *x x* of Fig. 1. Fig. 3 is a cross-section on line *y y* of Fig. 1. Fig. 4 is a cross-section on line *z z* of Fig. 1. Fig. 5 is a plan view of the tool with parts removed. Fig. 6 is a side view of the tool. Figs. 7 and 8 are detail views of the tweezers, &c.

In the drawings, A represents a flat circular disk or plate having a central hole B and being slightly dished in the center, as shown at *a*, into which the spring S is placed. On this plate A the central piece or bridge C is secured in place by a screw *c* and the steady-pins *d d*. The lower part *b* of the bridge is made partly circular and notched and has a hole corresponding to B. Upon the part *b* two curved lines *i*, crossing each other, are engraved or formed to be used as a guide in shaping the terminal curve of the balance-spring, one of the curves being for a right and the other for a left hand spring, as desired. On each side of the circular part *b* the bridge

is provided with a notch *e e*, into which the ends of the jaws D and E, formed of flat springs, fit. They are secured in place by a screw *f*, upon which they can be moved, and after the flat end of the spring S has been placed between either pin *h* or *h'*, right or left, it is clamped.

In using the tool the balance-spring is laid so that the outside coil will come on the outside of the pins *h* or *h'*. The bridge C is then curved down, as the slight central dishing of the plate A will insure that the outside coil only will be clamped between the bridge C and the plate A. One of the pins or screws *g*, having eccentric-shaped heads, according to right or left hand spring, is then turned and clamps the spring between the jaw D and pin *h* or between the jaw E and pin *h'*. The spring is then sprung into one of the holes H and bent to proper curve and set or tempered. The jaws D and E are revolved on the screws *f*, and after the flat end of the spring S has been secured in position the terminal curve is formed by the use of a pair of tweezers having curved prongs, as shown in Fig. 8.

Having thus described my invention, what I claim is—

1. A tool for bending and forming the over-coil or terminal curve of balance-springs, having a central bridge and two clamping jaws and pins arranged as shown and specified.

2. A tool for bending and forming the over-coil of balance-springs for watches, consisting of a plate to which is attached a central bridge having the curves of said over-coil marked thereon, in combination with jaws and pins arranged as set forth.

3. The combination of a plate A, to which the bridge is attached by pins *d d* and screw *c*, in combination with pins *h* and *h'*, and pivoted jaws D and E, clamped by eccentric screws *g* in the manner shown and described.

4. A watchmaker's tool consisting of a plate A, having the central dished part *a*, and the central bridge C, provided with curves *i i* for indicating right and left hand terminal curves of watch-springs, in combination with the pivoted jaws D E, pins *h h'*, and eccentric screws *g g*, all arranged as described.

5. The tool herein described, consisting of the dished plate A, to which the bridge is se-

cured, provided with the terminal curves *ii*, in combination with the pivoted jaws D and E, the pins *h h'*, and the eccentric screws *gg* for clamping the spring, as shown and specified.

- 5 6. In a tool for forming the over-coil of watch-springs, the combination of the dished plate A, the central bridge, and the pivoted jaws

with the eccentric head-screws, the pins *h h'*, and the screws *c* and *ff*, all arranged as specified.

CHARLES H. MILLER.

Witnesses:

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