

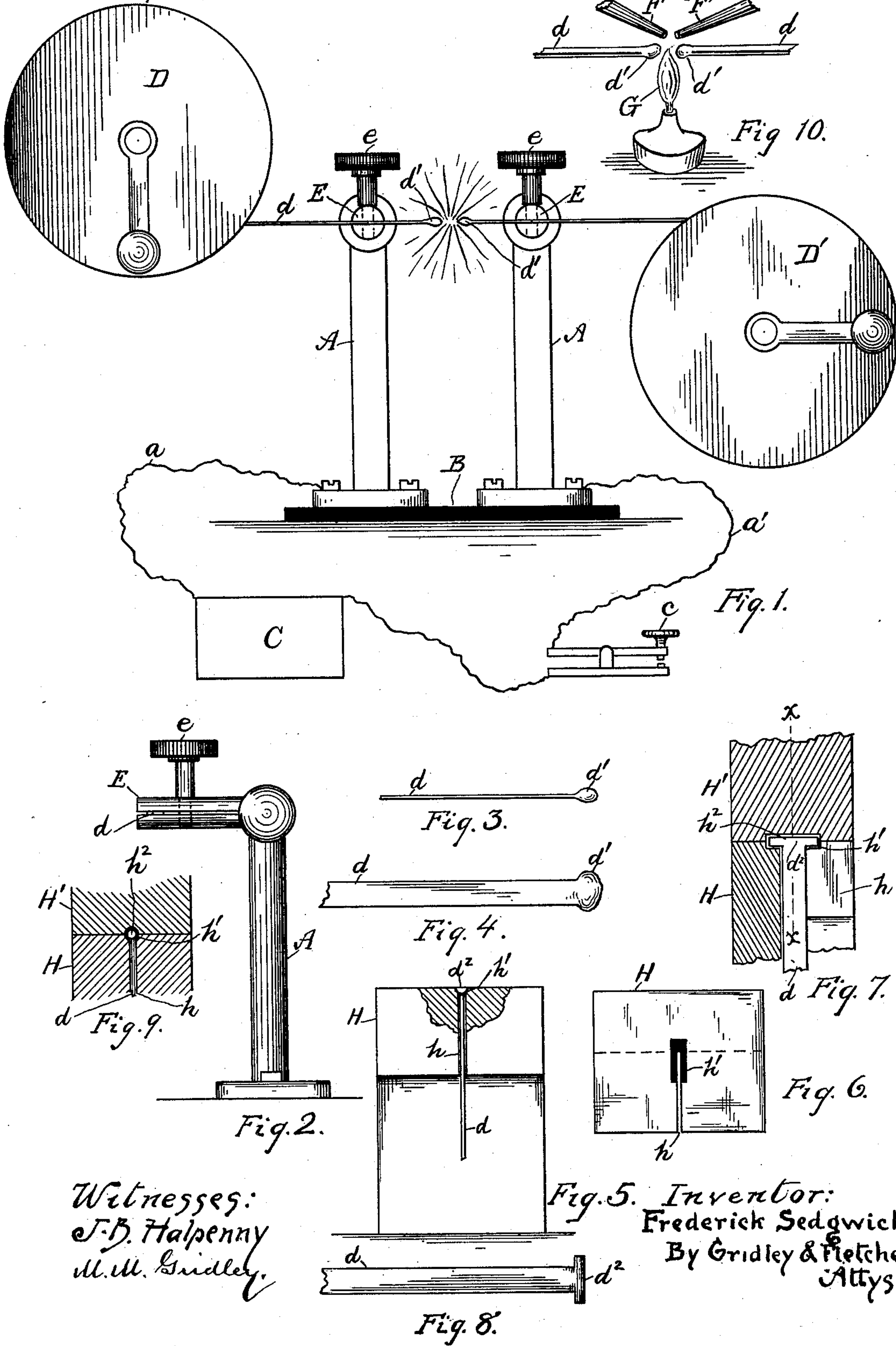
(No Model.)

F. SEDGWICK.

MANUFACTURE OF WATCH MAINSPRINGS.

No. 363,550.

Patented May 24, 1887.



UNITED STATES PATENT OFFICE.

FREDERICK SEDGWICK, OF CHICAGO, ILLINOIS.

MANUFACTURE OF WATCH-MAINSPRINGS.

SPECIFICATION forming part of Letters Patent No. 363,550, dated May 24, 1887.

Application filed July 10, 1886. Serial No. 207,635. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK SEDGWICK, of Chicago, in the county of Cook and State of Illinois, have invented a certain new and Improved Process in the Manufacture of Watch-Mainsprings, of which the following is a description, reference being had to the accompanying drawings, in which—

Figure 1 is a side view of an improved device for melting the spring to form a bulb upon its end. Fig. 2 is an end view in detail, showing one of the supporting-posts provided with a clamp for holding the spring. Fig. 3 is an edge view of a portion of a mainspring having a bulb formed thereon. Fig. 4 is a face view of the same. Fig. 5 is a side view of a die with a portion broken away, showing the recess therein for forming the cross-bar upon said spring. Fig. 6 is a top view of said die. Fig. 7 is a transverse vertical sectional view of a male and female die for forming said cross-bar. Fig. 8 shows a portion of a spring having said cross-bar formed thereon. Fig. 9 is vertical sectional view of said die, taken upon the line *xx*, Fig. 7. Fig. 10 shows a modification of the means employed for melting the spring to form the bulbs thereon.

Like letters of reference indicate like parts in the different figures.

In the manufacture of watch-mainsprings various methods have been resorted to for the purpose of providing means for attaching the outermost end of the coil to the drum. This is ordinarily accomplished by riveting upon the end of the spring a separate piece, known as the "brace," which consists of a short strip of thin metal of the same width as the spring, and provided with laterally-projecting lugs of sufficient length to be retained securely in the holes of the drum prepared therefor. The expense of forming this brace separately and attaching it to the spring adds greatly to the cost of the finished product, and in a measure impairs its practical value.

The purpose of my invention is to overcome this objection, and to provide a method whereby a brace similar to that in common use, and having sufficient metal therein to impart to it the necessary strength, may be swaged or formed upon the mainspring itself in such a manner as to cheapen and improve

the latter, all of which I accomplish substantially as hereinafter set forth and claimed.

In the drawings, *A A* represent two metal standards or supports attached rigidly to a base, *B*, of insulating material, said supports being electrically connected by means of wires *a a'* with dynamo or other electro generator *C*, a key, *c*, being interposed for normally breaking said circuit.

D D' are reels, upon the former of which is wound a metal strip, *d*, of an indefinite length, preferably tempered for use as a mainspring. The end of said strip is attached to the opposite reel, *D'*, said strip being carried through suitable clamps, *E E*, attached to the standards *A*, said clamps consisting of split arms, between which the strip *d* is inserted, as shown in Figs. 1 and 2, and retained, preferably, by means of set-screws *e e* or by means of the compression of the arms themselves, which may be made of spring metal.

Upon securing the metal strip in position, as described, the portion of the strip *d* between the clamps *E E* serves to complete the circuit with the dynamo or battery *C*, as the case may be. Upon compressing the button *c* and passing a powerful current over said strip *d* the latter is melted thereby midway between the two clamps, the metal separating at the point of fusion and forming drops or bulbs *d'* upon the end of each portion of the strip thus separated. This result may be accomplished in any way by means of which extreme heat may be concentrated at a given point without injury to the remaining portions of the spring; and I do not confine myself to the use of electricity for that purpose, as it may be accomplished by means of a compound blow-pipe of any well-known form, as indicated in Fig. 10, in which *F F'* are the blow-pipe tubes, in connection with an alcohol or other suitable flame, *G*, the strip to be melted being supported in the manner shown in Fig. 1, or in any suitable way. The strip *d* is thus preferably melted off into lengths representing twice, or substantially twice, that required for a mainspring, which may then be cut off in the middle, and after forming the brace thereon may be perforated at the opposite end in the usual way and shaped for use.

The braces may be formed from the bulbs *d'*,

as follows: Within a metal block or anvil, H, I cut a slot, *h*, of sufficient thickness to permit the strip *d* to fit edgewise therein, preferably in a vertical position. One end of said slot is countersunk, as at *h'*, thus forming a depression, into which the bulb *d'* is adapted to rest when the spring is inserted in the slot *h*. A similar die, H', Figs. 7 and 9, is then preferably provided, having a corresponding countersunk portion, *h''*, which forms a counterpart to the depression *h'*. Upon inserting the spring in the slot *h*, as described, and compressing the die H' against the bulb *d'*, said bulb is swaged so as to form a cylindrical cross-bar, *d''*, Fig. 8, the ends of which project laterally beyond the edges of the spring, as shown. It is obvious that said cross-bar *d''* may be square, polygonal, or semicircular in transverse section without varying the essential features of the invention, which is that it shall be integrant with the spring. Upon placing the latter in the die, as shown in Fig. 5, and striking the bulb *d'* with a hammer it may be formed into a semi-cylindrical cross-bar; but I prefer the use of the double dies, as stated.

Instead of melting the spring off in given lengths, as described, it may be cut into lengths corresponding to that of a mainspring, or twice that length, and one or both ends, as the case may be, exposed to the action of extreme heat until a bulb is formed thereon.

In lieu of the reel D', it is obvious that the strips may be drawn through and adjusted in the clamps by hand as fast as they are melted off.

I am aware that it is old to split the end of a mainspring and then bend the prongs outwardly, so as to form laterally-projecting ears, and I make no claim to such construction.

What I do claim, and desire to secure by Letters Patent, is—

1. The process of forming braces upon watch-mainsprings, which consists in first melting a bulb upon the spring by the action of extreme heat concentrated thereon at a given point, and then forming said bulb into the desired shape, substantially as specified.

2. The method of forming braces upon mainsprings, which consists in first melting a bulb thereon by means of extreme heat applied at the point desired, and then swaging said bulb in a suitable die, whereby a cross-bar is formed upon the end of the spring and integrant therewith, substantially as and for the purposes set forth.

3. The process of forming braces upon mainsprings, which consists in passing a continuous strip of steel into circuit with an electro-generator, melting the same off at given points by the action of the electric current, and then forming the ends in a suitable die, substantially as set forth.

4. As an improved article of manufacture, a watch-mainspring having a cross-bar integrant with and formed upon the end of the spring and extending entirely across the same, the ends of said cross-bar projecting laterally beyond the edges of the spring, substantially as and for the purposes set forth.

5. A watch-mainspring provided with lateral projections forming a part of a continuous cross-bar swaged upon the end of the spring, the diameter of which is greater than the thickness of the spring, substantially as and for the purposes specified.

FREDERICK SEDGWICK.

Witnesses:

D. H. FLETCHER,
J. B. HALPENNY.