

(No Model.)

F. ECAUBERT.

METHOD OF ORNAMENTING WATCH CASE CENTERS.

No. 434,539.

Patented Aug. 19, 1890.

Fig. 1.

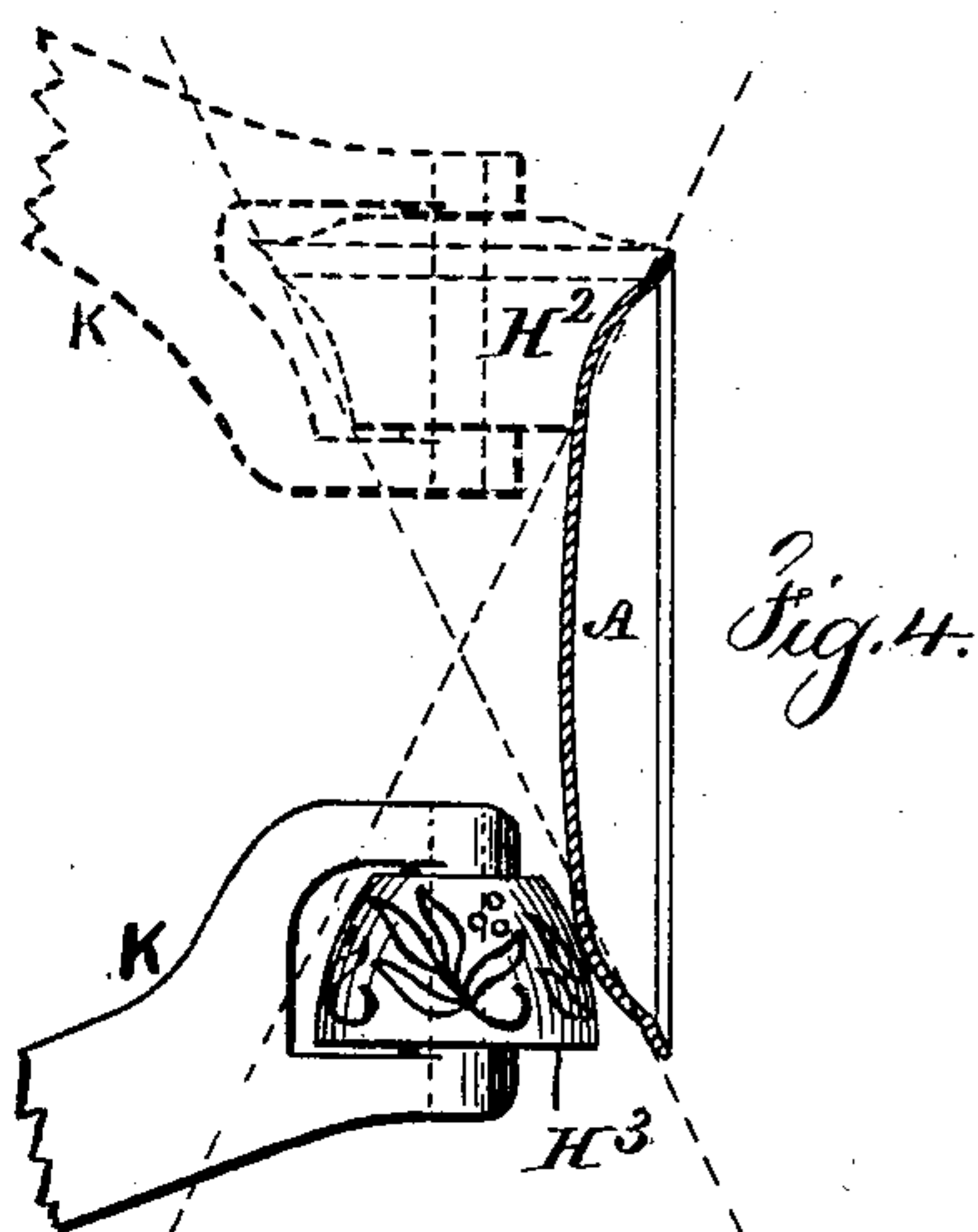
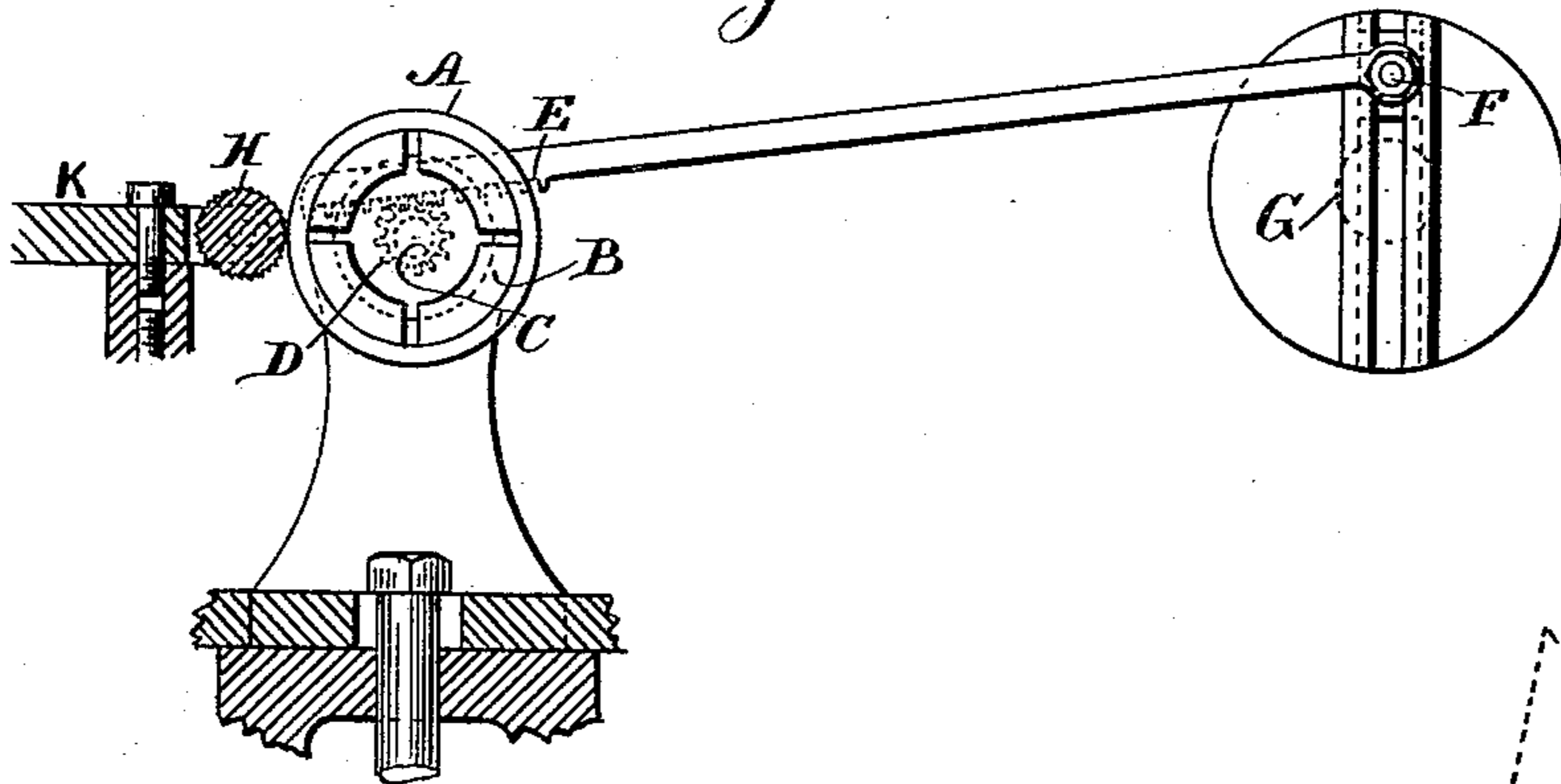


Fig. 2.

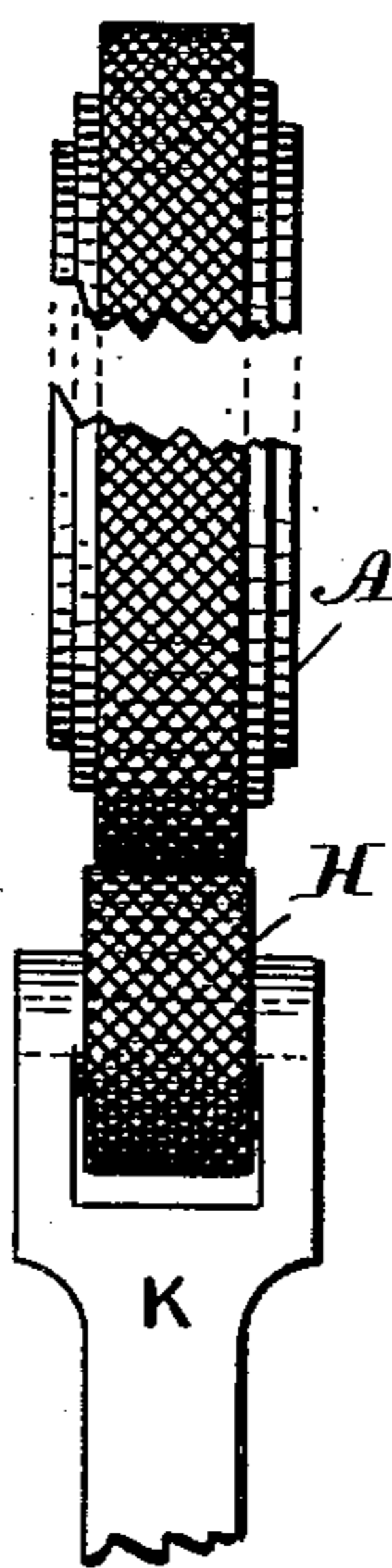
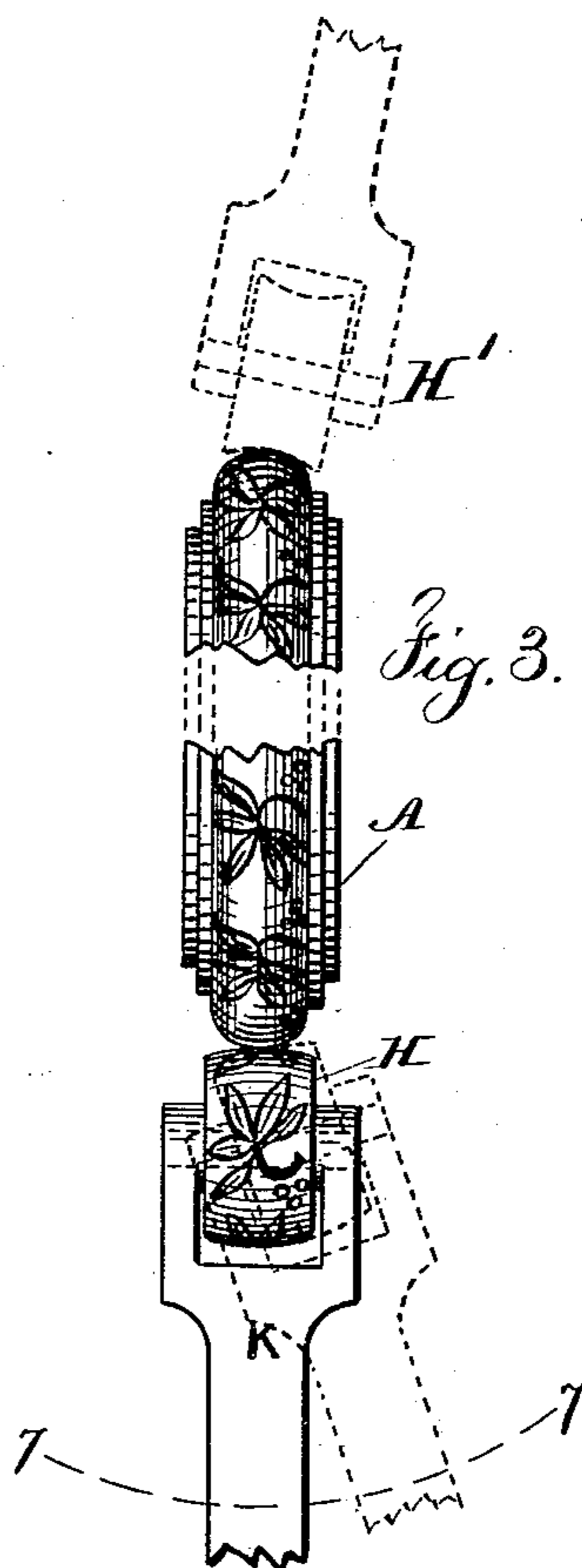


Fig. 3.



Witnesses

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FREDERIC ECAUBERT, OF BROOKLYN, NEW YORK.

METHOD OF ORNAMENTING WATCH-CASE CENTERS.

SPECIFICATION forming part of Letters Patent No. 434,539, dated August 19, 1890.

Application filed July 27, 1889. Serial No. 318,903. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC ECAUBERT, of Brooklyn, in the county of Kings and State of New York, have invented an Improvement in the Method of Ornamenting Watch-Case Centers and Similar Articles, of which the following is a specification.

Watch-case centers have been ornamented with regular patterns—such, for instance, as straight transverse ribs or diagonal ribs, known as “rope knurls or ornaments,” and also with diamond-shaped projections known as “barley-corn knurls and patterns.” These ornaments have been applied to the watch-case center by a circular ornamented wheel known as a “knurl,” and the watch-case center has been mounted upon and revolved by a chuck and mandrel to a lathe, and this has been revolved continuously after the knurling-tool is applied in such a manner to the center that the pattern thereon properly meets at the end of a complete revolution. In this operation the ornamentation is applied by a continuous movement, and where the watch-case center or similar article is convex the knurling-tool has sometimes received a lateral or rocking motion, in order that the surface of the knurl may be pressed properly against the convex edge of the watch-case center.

In knurling watch-case centers with leaves, buds, scrolls, commonly called “vermicelli,” and ornaments similar to engraved work, it is found impracticable to produce highly-finished work by a continuously-revolving movement, because the patterns made use of are sufficiently arbitrary and various to prevent their perfect repetition around the periphery of the knurling-roll.

The first part of my invention relates to the method of ornamenting watch-case centers and similar articles by an engraved knurling-roll, the watch-case center or similar article receiving a rotary or nearly rotary movement first in one direction and then in the other, in order that the pattern to be impressed upon the surface of the article to be ornamented may be finished entirely by the same portion of the same roller by which the ornamentation was commenced, or, in other words, so that the ornamentation from the knurl can be pressed progressively into the

surface of the metal by the repeated operations of identically the same portion of the roller, so that the metal will fill the knurl and a complete reproduction or counterpart thereof be formed on the watch-case center, and in instances where the watch-case center or similar article is rounding a lateral movement is given to the knurling-tool in its relation to the watch-case center, in order that the operations may be correctly performed all around such convex portion of the watch-case center.

In the drawings, Figure 1 illustrates a device that can be made use of for giving to the chuck or holder a rotary movement first in one direction and then in the other, and the position of the knurling-tool is also represented in said figure. Fig. 2 is an edge view of the watch-case center and of one form of knurling-tool, and Fig. 3 is a similar view representing another form of knurling-tool, the edge of the center being rounding; and Fig. 4 is a diagrammatic view of a watch-case lid and knurling-tools for the same.

The watch-case center A or similar article is received upon any suitable holder or chuck B upon an arbor or mandrel C, and upon this mandrel C is a pinion D, into which is geared a rack E, to which a reciprocating motion is given by a crank-pin F upon the counter-shaft G. This crank-pin F can be moved toward or from the counter-shaft G and clamped so as to vary the extent of end movement given to the rack E, and thereby cause the mandrel C to make a complete revolution first in one direction and then in the other, or such revolution may be less than a complete movement, as may be required, according to the article being ornamented, and I remark that any suitable device—such as a chain passing around a wheel and fastened at its ends to the rack—may take the place of the teeth in giving motion to the mandrel C first in one direction and then in the other.

The surface of the knurl H is to be engraved or ornamented with any suitable designs or figures, and it is to be held in the jaw K with a handle or any suitable device by which such knurl can be supported and pressed toward the article to be ornamented while the operation is being performed. I have shown in my application, Serial No. 263,867, filed February

13, 1888, a device which is especially adapted to holding a jaw and a knurling-tool while ornamenting the watch-case center or similar article.

5 If the watch-case center is cylindrical or nearly so at the surface upon which the ornament is to be placed, the knurl can be cylindrical, or nearly so, and the ornamentation applied across the entire width of the watch-
10 case center at one operation, it being understood that during this operation the watch-case center receives a complete or nearly complete rotation first in one direction and then in the other, so that the end portions of the
15 ornamentation applied by the knurl will come together, or nearly so, as the motion in one direction is arrested before the article commences to move in the other direction; but under all circumstances the same part of the
20 knurl or ornamenting roller will come to the same portion of the center to be ornamented at each movement of the parts, and the figures or ornamentation will be gradually impressed into the surface of the metal until such ornamentation is fully developed.

In cases where the metal to be ornamented is hard the knurling-roll may be slightly convex, in order that the ornamentation may be pressed in progressively across the faces to
30 be ornamented. In this instance the knurling-tool is to be moved laterally, as indicated by the arc of a circle at 7, Fig. 3, and it will also be apparent that this same movement has to be given in cases where the watch-case
35 center or article being ornamented is rounding upon its edge, the extent of the lateral motion increasing when the edge of the watch-case center is more rounding or bold, and the reverse.

40 It will be apparent that it is not advantageous to make use of a roll or knurl with a concave ornamented periphery, as indicated by dotted lines at H', upon a convex watch-case center or similar article to be ornamented, because the edge of the watch-case
45 center that is farthest from the axis of rotation would in that case come into contact with the portion of the ornamenting-knurl that is nearest to the axis of rotation of such
50 knurl, and the edge portions of the convex watch-case center that are nearest to the axis of rotation would come into contact with the edge portions of the knurling-tool that are farthest from the axis of rotation, and some
55 portions of the surfaces in contact would have to slip one on the other, and the pattern produced would not be perfect. I do not, however, limit myself in this particular. It will be understood that the power made use of to
60 rotate the respective parts might be communicated to the axis of the knurling-roll and that the watch-case center or similar article might be free to turn upon its center in the operation; but usually it is preferable to give
65 a rotary motion first in one direction and then in the other to the article to be ornamented.

In knurling watch-case lids or backs by the action of a knurling-roll such roll might have a concave conical surface, as shown by
70 dotted lines at H², Fig. 4; but it is preferable to have a convex conical surface, as shown at H³, because the relative proportions of the diameters is more accurate, and the pressure required is less because a less extent of sur-
75 face is undergoing the ornamenting operation at one time. Of course the knurl has to be rocked progressively to bring it into contact with all portions of the surface to be ornamented.

When the article is to be ornamented upon a half or other portion of its periphery instead of upon the entire periphery, the extent of motion is lessened to the desired number of degrees, so as to give a partial reciproca-
80 tion first in one direction and then in the other.

The axis of rotation of the knurl and the axis of rotation of the article are parallel in Fig. 2, and in Fig. 4 they are represented as
90 at right angles, or nearly so, and the position of the axis of one varies in relation to the axis of the other during the transfer of the ornament under all circumstances.

I claim as my invention—

95 1. The method herein specified of ornamenting watch-case centers and similar articles, consisting in pressing against the article to be ornamented a circular ornamenting roll or knurl having the designs to be produced upon
100 the periphery thereof and communicating to the respective parts a rotary or partially rotary motion first in one direction and then in the other while the ornamenting-knurl is pressed against the article to be ornamented,
105 so that the ornaments are applied by a progressive action to the periphery, substantially as set forth.

2. The method herein specified of ornamenting watch-case centers and similar articles,
110 consisting in pressing against the article to be ornamented a roll or knurl having upon its periphery the desired ornaments, communicating to the respective parts a rotary or partially rotary motion first in one direction
115 and then in the other, and moving or rocking the knurling-tool laterally to bring the surface of the roll into contact with the surface of the article to be ornamented, substantially
120 as set forth.

3. The method herein specified of applying ornaments to the surface of watch-case centers and similar rounding articles, consisting in pressing a knurling-tool having the counter-
125 part of the design against the said center or similar article and imparting a partial or complete rotary motion in first one direction and then the other to the article and to the knurl to bring the knurl into action against
130 the desired portion of the periphery of the article, and also giving to the knurl a movement to vary the position of the axis of the knurl to the axis of the center or similar article, substantially as specified.

4. The method herein specified of applying ornaments around a watch-case center, back, or other circular article, consisting in pressing against the article to be ornamented a
5 knurling-tool having upon its surface the pattern to be impressed and giving to the parts a circular or partially circular movement first in one direction and then in the other, and changing the direction of the axis of the knurl to the axis of the article during the operation to cause the pattern on the knurl to be rolled into the round article, substantially as specified.

Signed by me this 22d day of July, 1889.

F. ECAUBERT.

Witnesses:

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CHAS. H. SMITH.