Feb. 25, 1969 A. CHARPILLOZ 3,429,120

DEVICE FOR FIXING THE INNER END OF A TIMEPIECE HAIRSPRING AND FOR ITS CENTERING AND TRUING IN THE FLAT

Filed June 13, 1966

FIG.1

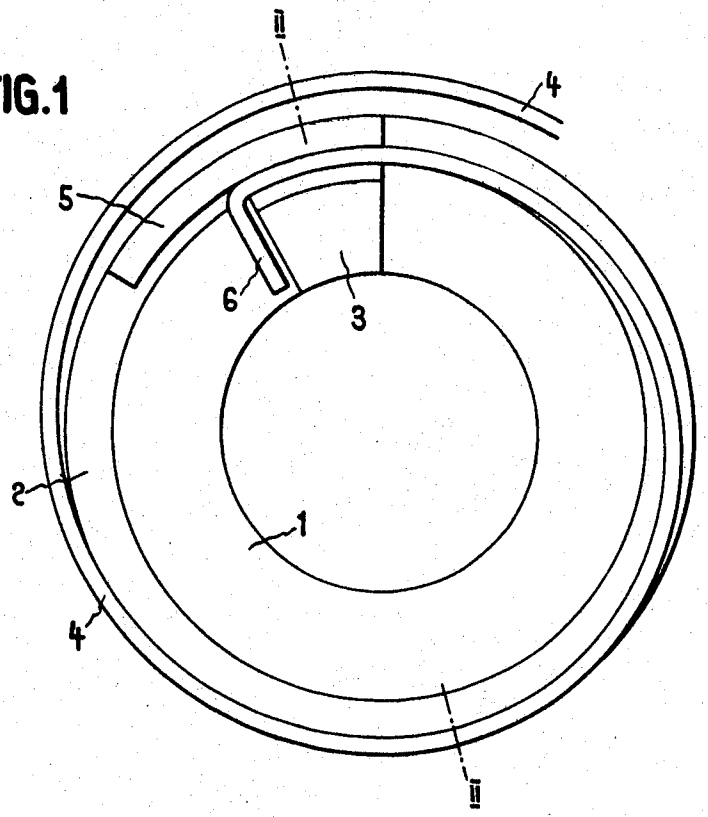
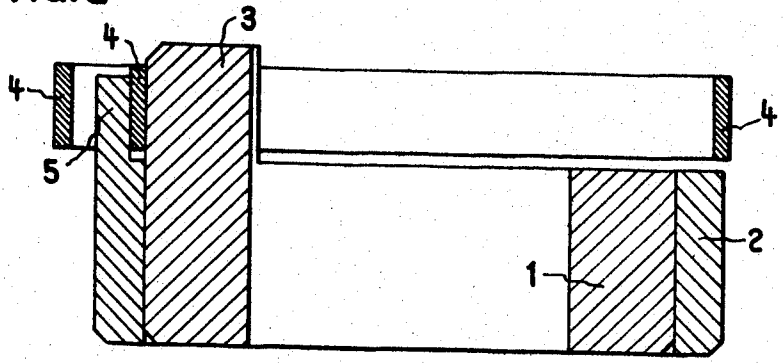


FIG.2



INVENTOR
Arnold Charpilloz
BY Imirie & Smiley
ATTORNEYS

United States Patent Office

3,429,120
Patented Feb. 25, 1969

3,429,120

DEVICE FOR FIXING THE INNER END OF A TIMEPIECE HAIRSPRING AND FOR ITS CENTERING AND TRUING IN THE FLAT

Arnold Charpilloz, 2735 Bevilard, Switzerland

Filed June 13, 1966, Ser. No. 557,292
Claims priority, application Switzerland, July 6, 1965, 9,468/65

U.S. Cl. 58—115 2 Claims
Int. Cl. G04b 17/32

ABSTRACT OF THE DISCLOSURE

A hairspring is fixed in centered position and has its coils located in a plane perpendicular to the balance staff by clamping the inner end of the spring between axially fixed extensions on the inner and outer rings of a collet adapted to be placed on the balance staff. The axial extensions are in the form of a 30° inner annular segment and a 60° outer annular segment which are overlapped to clamp a hairspring end, are relatively adjustable to effect centering of the hairspring and which project above the support surface upon which the hairspring rests so that the clamping engagement affixes the hairspring while automatically locating its coils in a plane perpendicular to the balance staff opening of the collet and allowing relative rotation of the collet rings to effect centering of the hairspring with respect to the balance staff opening of the collet.

A plurality of systems are known in the horological industry for fixing the inner end of a hairspring. Presently, the systems used involved two separate operations:

(a) Rigid fixation of the inner end of the hairspring to the collet;

(b) Locating the coils of the hairspring in a single plane and centering of the hairspring.

The first operation forms the subject matter of several inventions the purpose of which was the mechanization thereof. The second operation, on the contrary, still requires a skilled working staff, which is presently rare and very expensive.

The present invention aims at combining both above-mentioned operations into a single one and at mechanizing it. This system offers the advantage of doing away with the skilled working staff, while obtaining an accurate point of attachment and keeping intact the physical properties of the hairspring.

The device according to the invention is characterized by a collet comprising an inner ring provided with an axial extension having the shape of an annular segment and extending over a certain angle, and an outer ring capable of being turned about the inner ring, said outer ring being provided with an axial extension having the shape of a flange and extending over an angle greater than the angle of said annular segment, the whole being arranged in such a way that after placing the inner end of the hairspring against the outer face of said annular segment, it is sufficient to turn the outer ring by a certain angle in order to jam the hairspring between said annular segment and said flange.

The accompanying drawing represents, by way of example, an embodiment of the invention.

FIG. 1 is a top plan view of said embodiment.

FIG. 2 is a cross-sectional view along the line II—II in FIG. 1.

The device illustrated in the drawing includes a collet consisting of an inner ring 1 and an outer ring 2 capable of being turned about the inner ring 1. The inner ring 1 is provided with an axial extension 3 having the shape of an annular segment and extending over an angle of about 30°. This annular segment 3, upon profile-turning, has been left on the circular crown formed by the inner portion of the collet. The height of the annular segment 3 is somewhat greater than that of the hairspring. The inner ring 1 is not split and is adapted to be driven onto the balance staff.

The outer ring 2 is provided with an axial extension 5 having the shape of a flange and extending over an angle of about 60°, i.e., an angle greater than the angle of the annular segment 3. The height of the flange 5 is nearly equal to that of the hairspring 4.

The hairspring 4 has near its inner end a bent portion 6 extending radially towards the inside.

The outer diameter of the ring 1 is equal to the inner diameter of the ring 2, but the flange 5 of the ring 2 has such a thickness that between its inner wall and the outer wall of the annular segment 3 a space is left which is able to receive without any play the hairspring 4.

Both rings 1 and 2 of the collet may be made from different metals, the inner ring being made for instance from brass and the outer ring from steel.

The operation of fixing the hairspring to the collet is as follows:

The rings 1 and 2, which may also be called "collet center" and "collet cup" respectively, are placed into each other and have such an angular position that the flange 5 and the annular segment 3 are not in the same azimuth. The hairspring 4 is placed against the outer face of the annular segment 3 and rests on an appropriate support (not shown) whose bearing surface for the hairspring is perpendicular to the balance staff.

In order to fix the hairspring 4 to the collet 1, 2, it is sufficient to turn the "collet cup" 2 in the clockwise direction in FIG. 1, by means of an appropriate tool (for instance with tweezers seizing the flange 5), until the flange 5 overlaps the annular segment 3, as shown in FIG. 1. The inner winding of the hairspring 4 is thus firmly clamped, the locating of the coils of the hairspring in a single plane being obtained by means of the support referred to and the centering being afforded by the bearing of the hairspring against the annular segment 3.

In the example shown, the hairspring 4 has a bent portion 6 near its inner end, said portion bearing against one of the side faces of the annular segment 3. In a modified embodiment, however, this bent portion might be omitted, the jamming of the hairspring between the annular segment 3 and the flange 5 providing for a sufficient fixation of the hairspring 4.

It would be possible to use an annular segment 3 extending over an angle less than 30°, but in this case, it would be recommendable to reinforce the fixation of the hairspring 4 by sticking it to the annular segment 3.

What I claim is:

1. A device for fixing the inner end of a timepiece hairspring and for centering the hairspring while locating its coils in a single plane, characterized by a collet comprising an inner ring presenting an opening to receive a balance staff and provided with an axial extension having

the shape of a first annular segment and extending over a certain angle, and an outer ring capable of being turned about the inner ring, said outer ring being provided with an axial extension having the shape of a second annular segment and extending over an angle greater than the angle of said block, the whole being arranged in such a way that after placing the inner end of the hairspring against the outer face of said first annular segment, it is sufficient to turn the outer ring by a certain angle in order to jam the hairspring between said annular segments and thereby locate the coils of the hairspring in a single plane perpendicular to the axis of the balance staff opening in the collet.

2. A device as claimed in claim 1, characterized in that said first segment including an angle of about 30°, whereas said second segment including an angle of about 60°.

References Cited

FOREIGN PATENTS

287,610 4/1953 Switzerland.

RICHARD B. WILKINSON, *Primary Examiner.*

L. HAMBLEN, *Assistant Examiner.*