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3,287,799

METHOD OF MAKING AN OSCILLATING SET FOR CLOCK WORK-MOVEMENT

Filed Dec. 16, 1964

2 Sheets-Sheet 1

FIG.1

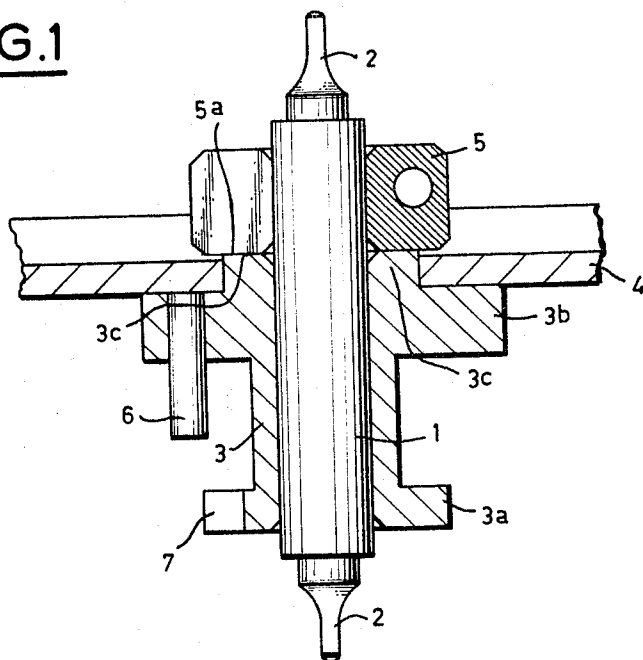
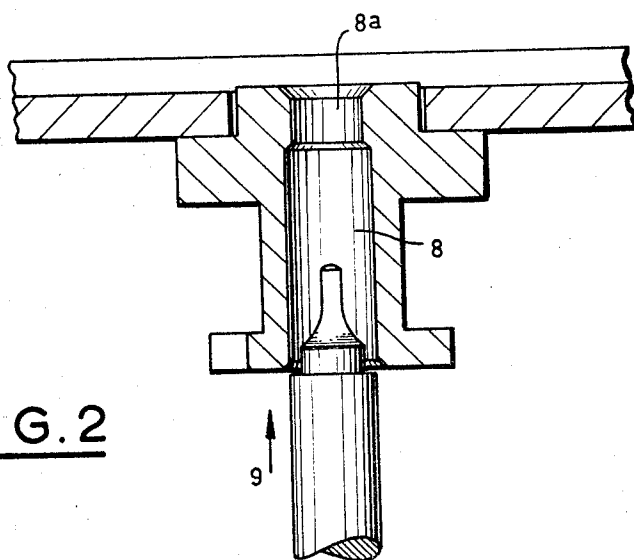


FIG.2



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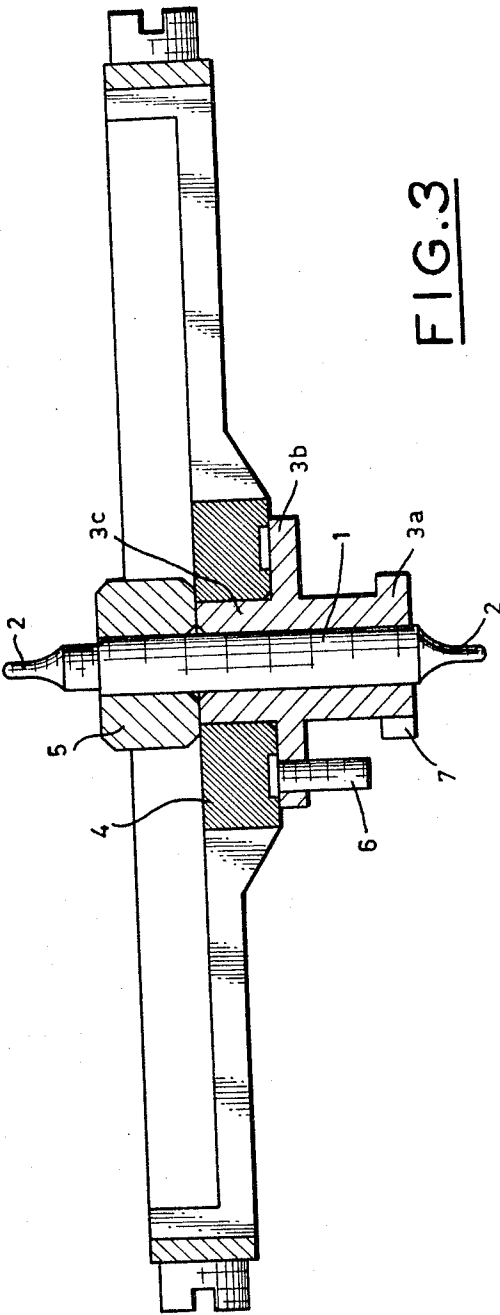


FIG. 3

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METHOD OF MAKING AN OSCILLATING SET FOR CLOCK WORK-MOVEMENT

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1 Claim. (Cl. 29—178)

The present invention relates to a method of making an oscillating set for clock work-movement.

The oscillating set of watches comprises a staff on the shoulders of which are fitted the balance, the escapement roller, and the collet adapted to render the inner extremity of the balance-spring integral with the set. The staff is provided with pivots, by means of which it can oscillate in bearings of the watch-frame.

Such an arrangement has the drawback that it cannot ensure the perfect concentricity of the balance, of the roller, and of the collet with respect to the pivots.

Moreover, the fixation, by riveting or driving on the balance staff of the roller and of the balance, give rise to tensions resulting in a distortion of the assembled parts, thus increasing the lack of concentricity.

It has been endeavoured to meet these drawbacks by fitting the balance and the collet on extensions of the roller, and thereupon fixing the whole assembly on a cylindrical balance staff. However, the riveting of the balance on that roller collapses the roller, which leads to unwanted distortion.

Finally, it has been endeavoured to fit the roller, the balance and the collet on a cylindrical staff. While in such a form of embodiment, the problem of concentricity is solved, however, other drawbacks arise, due to the absence of axial stops between the constituent parts.

The object of the present invention is precisely to provide a method of making an oscillating set, in which the centering and alignment achieved are better than what has been obtained to this day.

The oscillating set for clock work-movement according to the invention, comprises a cylindrical staff, provided with pivots, a collet for fixing the balance-spring, a bushing provided with two protrusions forming the smaller and the main escapement rollers, and with a collar which is adapted to receive the balance. Said oscillating set is characterized in that the bore of said bushing is of reduced cross-section in front of the collar, in order that, when the cylindrical staff is force-fitted into the bore of the bushing, the diameter of the collar is caused to increase, whereby the balance is made integral with said bushing.

The invention will now be described with reference to the accompanying drawing, wherein:

FIGURES 1 and 2 are a general view and a detail view respectively in cross-section, of a first form of embodiment, and

FIGURE 3 is a vertical section of a second form of embodiment.

The oscillating set according to FIG. 1 comprises, on the one hand, a cylindrical staff 1 provided with pivots 2, and on the other hand, a bushing 3 forming the escapement roller and provided with two protrusions 3a and 3b acting as the smaller and the main rollers respectively, a collar 3c on which is placed the balance 4, and the collet 5 adapted to retain the extremity of the balance-spring (not shown).

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The impulse pin 6 is fitted in an opening to the protrusion 3b, whereas the protrusion 3a has a notch 7, necessary for actuating the lever escapement.

Bushing 3 (FIG. 2) has a bore 8, the cross-section of which is reduced at 8a, in front of the collar 3c. Said collar has a diameter slightly smaller than that of the hole made in the balance-arm, so that it can easily penetrate into said hole. An appropriate choice of the diameters permits slight blocking of the cylindrical staff 1 with respect to bore 8.

The mounting of the constituent parts of that oscillating set is achieved as follows:

The balance for 4 is first placed on the collar 3c, then the staff 1 is driven into bore 8 in the direction of arrow 9. Whenever that staff penetrates into portion 8a of smaller cross-section, it will distort that portion, thereby increasing the diameter of collar 3c which is then squeezed in the balance bore. The collet provided with the balance-spring is then driven on staff 1. Said collet will rest, by its lower face 5a, on the upper face 3c of the bushing.

In view of the increase of the collar diameter, the balance is tightly fixed to the bushing, without it being necessary to proceed with a riveting, as is usually the case.

The set, once its elements are mounted, keeps a perfect concentricity since none of these elements has undergone stresses likely to cause a collapse or a distortion. Moreover, and still in order to suppress the lack of centering, it is possible to rectify the diameter of staff 1 with respect to its pivots.

The assembly thus achieved has, as regards the centering and the alignment of its elements, a precision never achieved with the methods or devices known to this day.

The oscillating set shown in FIG. 3 comprises, on the one hand, a pivoting cylindrical staff 1, and, on the other hand, a bushing forming the escapement rollers and having two protrusions acting as the smaller and the main rollers respectively, a collar on which is placed the balance 4, and a collet 5 adapted to retain the extremity of the balance-spring (not shown).

The impulse pin 6 of the main roller is fitted in an opening of the protrusion 3b, whereas protrusion 3a is provided with a notch 7, necessary for operating the lever escapement.

Prior to the mounting, the staff is of a diameter slightly greater than the bore of the bushing, and the lower diameter of the hole made in the balance-arm is slightly smaller than the diameter of the collar.

The mounting is achieved by forcing the balance on the collar, then by driving the staff in the bushing. The collet bearing the balance-spring is then driven in the staff, on which it is retained by the collar. The bushing is thus submitted to opposed internal and external pressures which hold it tightly.

The method of the invention is rapid and can easily be effected by automatic means.

What I claim is:

Method for making an oscillating set for a clock work-movement comprising the steps of providing a bushing having at one end thereof a collar and an axial bore the diameter of which is reduced in front of said collar near the upper face thereof, said collar having an outside diameter that is slightly smaller than a hole in a balance so that said collar can easily penetrate into said hole, placing said balance on said collar so that said collar penetrates said hole, then driving a staff into said bore

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of said collar so as to distort the same in its section of reduced diameter thereby increasing the diameter of said collar and squeezing the same into said hole of said balance to make said balance and staff rigid, and then, driving a collet provided with a balance spring on said staff until said collet rests against said upper face of said bushing.

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References Cited by the Examiner

UNITED STATES PATENTS

217,291	7/1879	Lambert	58—140
744,719	11/1903	Church	58—140

4

1,784,755	12/1930	Rosenberg.	
2,125,866	8/1938	Bell	29—178
2,263,484	11/1941	Brendler	58—140

FOREIGN PATENTS

1,216,100	11/1959	France.
1,301,939	7/1962	France.
546,908	3/1932	Germany.

10 JOHN F. CAMPBELL, *Primary Examiner.*
GERALD F. BAKER, THOMAS H. EAGER, *Examiners.*