United States Patent

Morita

[15] **3,676,994**

[45] **July 18, 1972**

[54] HAND SETTING MECHANISM FOR WATCHES

[72] Inventor: **Katsuhiko Morita,** Tokyo, Japan

[73] Assignee: **Kabushiki Kaisha Daini,** Tokyo, Japan

[22] Filed: **Aug. 8, 1969**

[21] Appl. No.: **848,642**

[52] **U.S. Cl.** **58/68**

[51] **Int. Cl.** **G04b 27/04**

[58] **Field of Search** 58/34, 63, 73, 80, 85.5, 67, 58/68

[56] **References Cited**

UNITED STATES PATENTS

R12,512	7/1906	Perrin	58/68
2,574,430	11/1951	Allen	58/34 X
1,099,307	6/1914	Menns	58/67

FOREIGN PATENTS OR APPLICATIONS

463,467	8/1913	France	58/63
116	3/1870	Italy	58/63
16,856	8/1905	Great Britain	58/67
243,104	12/1891	Switzerland	58/67
28,541	7/1903	Switzerland	58/67

Primary Examiner—Richard B. Wilkinson
Assistant Examiner—George H. Miller, Jr.
Attorney—Robert E. Burns and Emmanuel J. Lobato

[57] **ABSTRACT**

A hand-setting mechanism for wrist and pocket watches having a single clutch gear directly, releasably coupling the watch winding stem to a gear train for setting the hands of a watch. The clutch gear is coupled with the winding stem through a socket thereon releasably receiving an end of the winding stem. Each of the mechanism gears has its axis of rotation in a given common plane passing through the longitudinal axis of the winding stem, and the cross-section of the arrangement has a minimum dimension so that watches provided with the mechanism can have minimum transverse and thickness dimensions.

2 Claims, 4 Drawing Figures

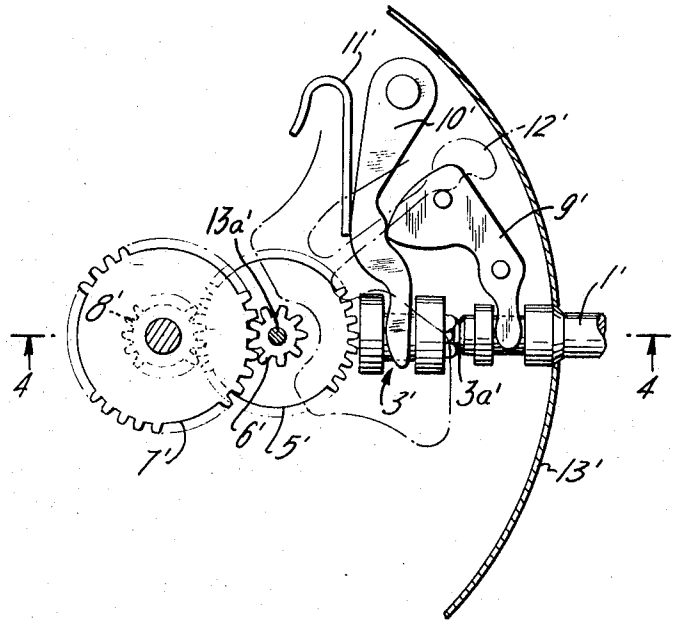


FIG. 1

PRIOR ART

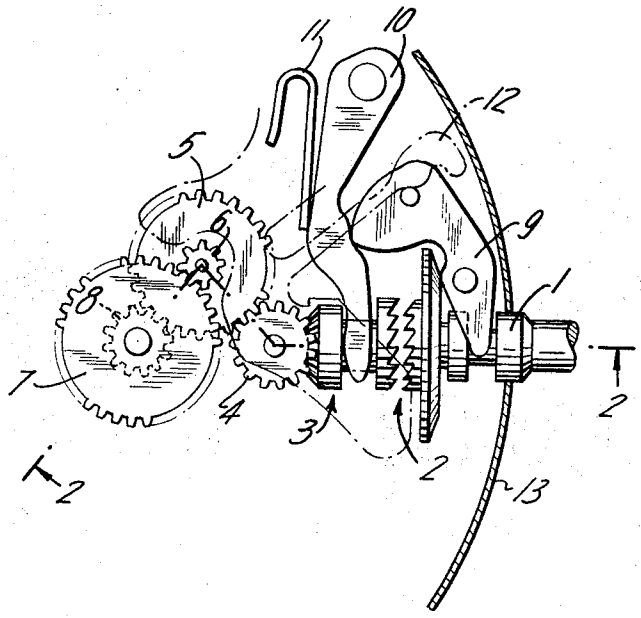


FIG. 2

PRIOR ART

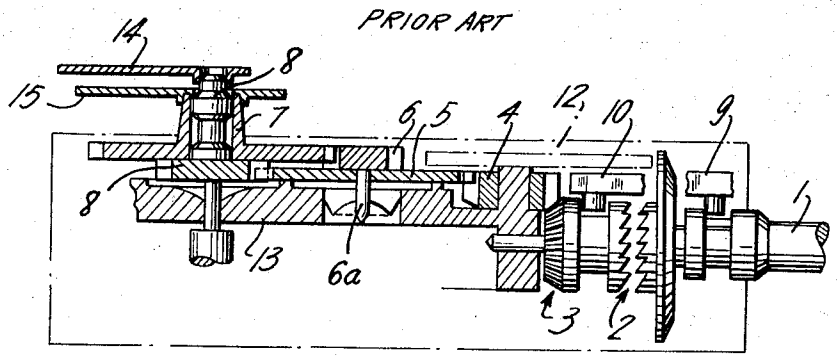


FIG. 3

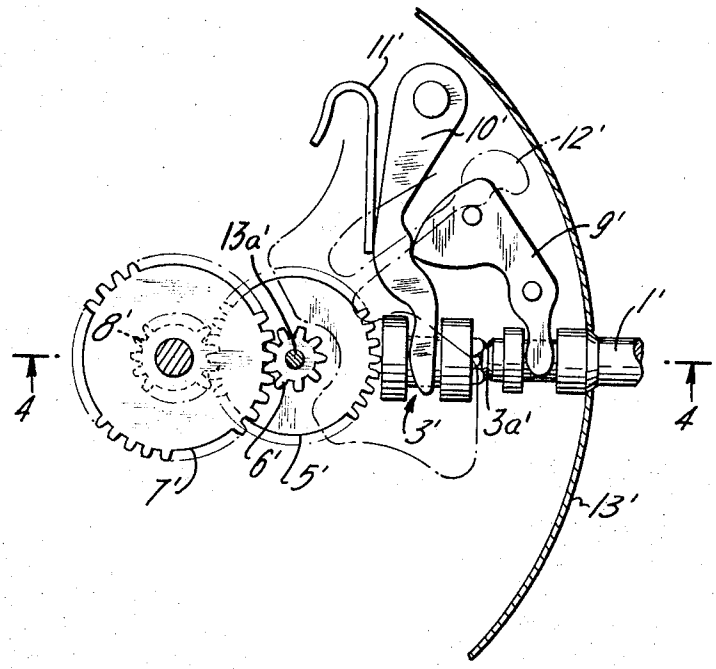
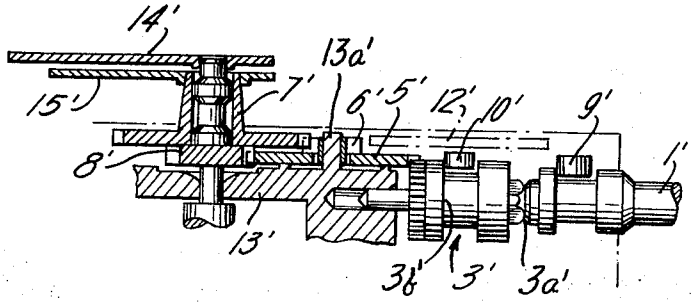


FIG. 4



HAND SETTING MECHANISM FOR WATCHES

This invention relates generally to watches and more particularly to hand-setting mechanisms for pocket and wrist watches.

The conventional hand-setting mechanism for watches has a gear train for setting the hands coupled to a watch winding stem through a clutch device having clutch gears with axially extending teeth. The various gears are disposed in different planes such that the cross-section dimension of the mechanism is relatively large and the winding stem axis is necessarily spaced a greater distance from the watch dial than would be the case if the hand-setting mechanism were reduced in cross-section and made more compact.

It is a principal object of the present invention to provide an improved hand-setting mechanism for watches more easily and economically constructed.

Another object is to provide a hand-setting mechanism for watches with a minimum of component parts all arranged with a minimum cross-section and a minimum transverse dimension so that wrist watches provided with a mechanism according to the invention can be constructed thinner and more compact than was possible heretofore.

The hand-setting mechanism according to the invention comprises a single clutch gear having a socket coaxial with the winding stem of a watch for releasably, selectively coupling the clutch gear to the winding stem. A gear train in the mechanism for setting the hands is directly engaged with the clutch gear, and thereby to the winding stem. The use of the single clutch gear shortens the mechanism in a radial direction of the watch and allows the mechanism to be reduced in cross-section so that more compact and thinner watches can be constructed when the invention is employed.

Other features and advantages of the hand-setting mechanism for watches in accordance with the present invention will be better understood as described in the following specification and appended claims, in conjunction with the following drawings, in which:

FIG. 1 is a fragmentary plan view of a watch provided with a known hand-setting mechanism;

FIG. 2, is a cross-section view taken along section line 2—2 of FIG. 1;

FIG. 3, is a fragmentary plan view of a watch provided with a hand-setting mechanism according to the invention; and

FIG. 4, is a cross-section view taken along section line 4—4 of FIG. 3.

As illustrated in FIGS. 1 and 2 a conventional hand-setting mechanism for a watch, for example a wrist watch, illustrated fragmentarily, has a winding stem 1 to which is connected one of two toothed clutch gears of a clutch 2. The clutch 2 is engaged and disengaged by axial manipulation of the stem and rotation thereof drives rotationally a bevel clutch gear 3, having an axial extension for rotationally mounting it as illustrated, for effecting setting of the hands of the watch.

The clutch gear 3 meshes with a setting wheel 4 which drives a minute wheel or gear 5 integrally connected to a minute pinion 6 which drives an hour wheel or gear 7 provided with an hour hand 15. Both the minute gear 5 and its pinion 6 are pivotally mounted on a spindle 6a as illustrated. The hour gear 5 meshes with a cannon pinion 8 provided with a minute hand 14.

The winding stem 1 is provided with two axially spaced collars between which is disposed a pin of a pivoted setting lever 9 engaged with a yoke 10 operably connected to the clutch 2 and biased by a yoke spring 11. A setting lever spring 12 is

provided in known manner and the above-described elements are mounted on a plate 13 as illustrated.

It will be understood that the hand-setting mechanism is actuated by manually manipulating the stem 1 for engaging the clutch 2 and disengagement is restored in known manner. It can be seen that the setting gear 4 is necessary solely to couple the clutch and setting stem to the gear mechanism for setting the hands and could be dispensed with if direct coupling is effected between the clutch and the hand-setting gears. Moreover, the known construction has the gears arranged such that a considerable vertical distance, in the drawing, exists between horizontal planes within which the gears lie and the plane of the axis of the clutch and the winding stem as can be seen in FIG. 2. Thus the thickness of a watch may be reduced by reducing the cross-section of the mechanism illustrated in FIG. 2.

Mechanism according to the invention is illustrated in FIGS. 3 and 4 in which primed reference numerals have been used to identify the parts thereof corresponding to the mechanism illustrated in FIGS. 1 and 2. As can be seen in the drawings in FIG. 3 a winding stem 1′ is provided and has "squared" end which fits into an extension defining a socket 3*a*′ in a clutch gear 3′. It being understood that the clutch gear socket is shaped to receive the "squared" end of the stem 1′. It has two collar-like elements integral therewith as illustrated defining a circumferential groove 3*b*′. The clutch gear 3′ directly drives a minute wheel 5′ having a pinion 6′ driven therewith. The minute wheel and pinion are rotationally mounted on a bearing journalled on an upright projection 13*a*′ on a plate 13′.

The remainder of the hand-setting mechanism is constructed similarly to that heretofore described. An hour gear 7′ is driven by the pinion 6′ and the minute gear 5′ drives a cannon pinion 8′ which sets a minute hand 14′. The remainder of the arrangement is similar to that heretofore described as to the remaining elements 9–12.

It can be seen from the plan view in FIG. 3 of mechanism according to the invention that the longitudinal axis of the winding stem is in a same plane as that in which the axis of rotation of the hand-setting gears 5′–8′ are disposed. Thus the extent of the gears in a radial direction is reduced. The need of a setting gear 4 is eliminated and the cross-section dimension of the arrangement is reduced so that the stem is closer to the watch dial, not shown. The invention accordingly provides a much more compact and more easily constructed hand-setting mechanism allowing thinner and smaller watches to be constructed when mechanism according to the invention is used therein.

What I claim and desire to secure by Letters Patent is:

1. In a watch having an hour hand, a minute hand and an axially displaceable and rotationally mounted winding stem, a hand-setting mechanism comprising, a minute gear, other gears driven from said minute gear for setting the hour and minute hands, a single clutch gear for selectively directly coupling the winding stem and the minute gear, said single clutch gear having means defining a socket selectively receiving an end of said winding stem the end of said winding stem mating internally with said socket, a longitudinal axis of said winding stem being disposed in a given plane, and said minute gear, said other gears, and said single clutch gear each have an axis of rotation disposed in said given plane.

2. In a watch having an hour hand, a minute hand and a winding stem, a hand-setting mechanism according to claim 1, in which said socket and said end of said winding stem are coaxial.

* * * * *