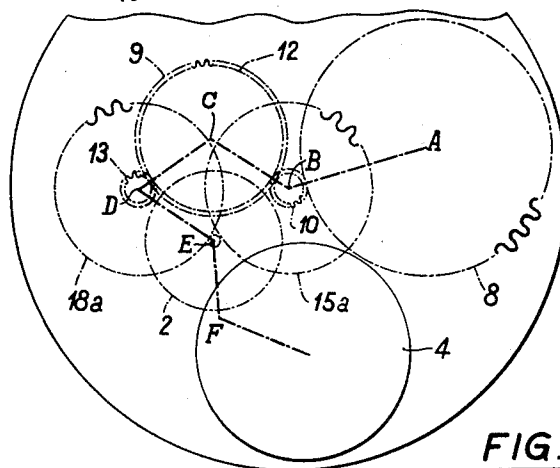
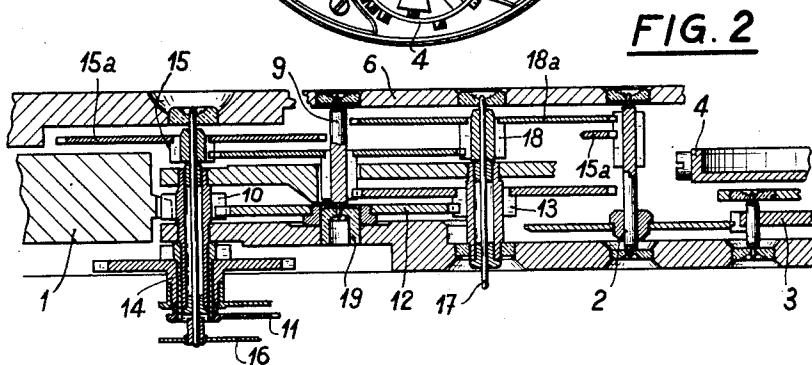
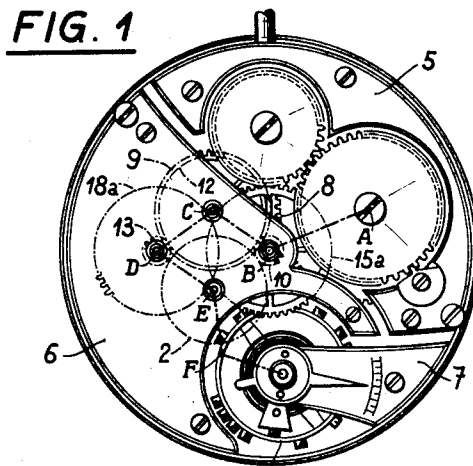


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WATCH MOVEMENT

4 Sheets-Sheet 1

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WATCH MOVEMENT

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4 Sheets-Sheet 2

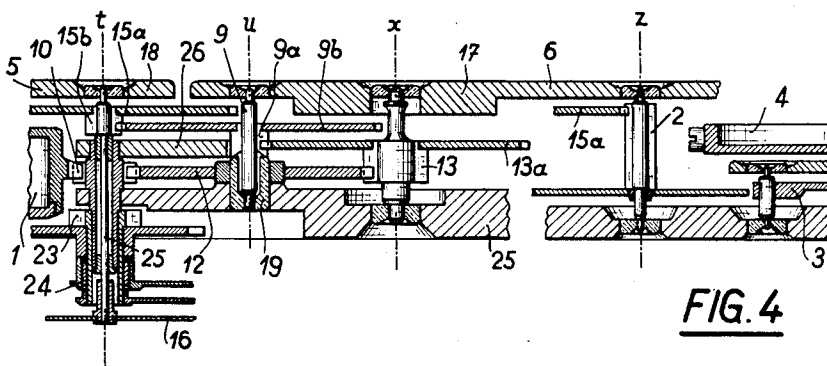


FIG. 4

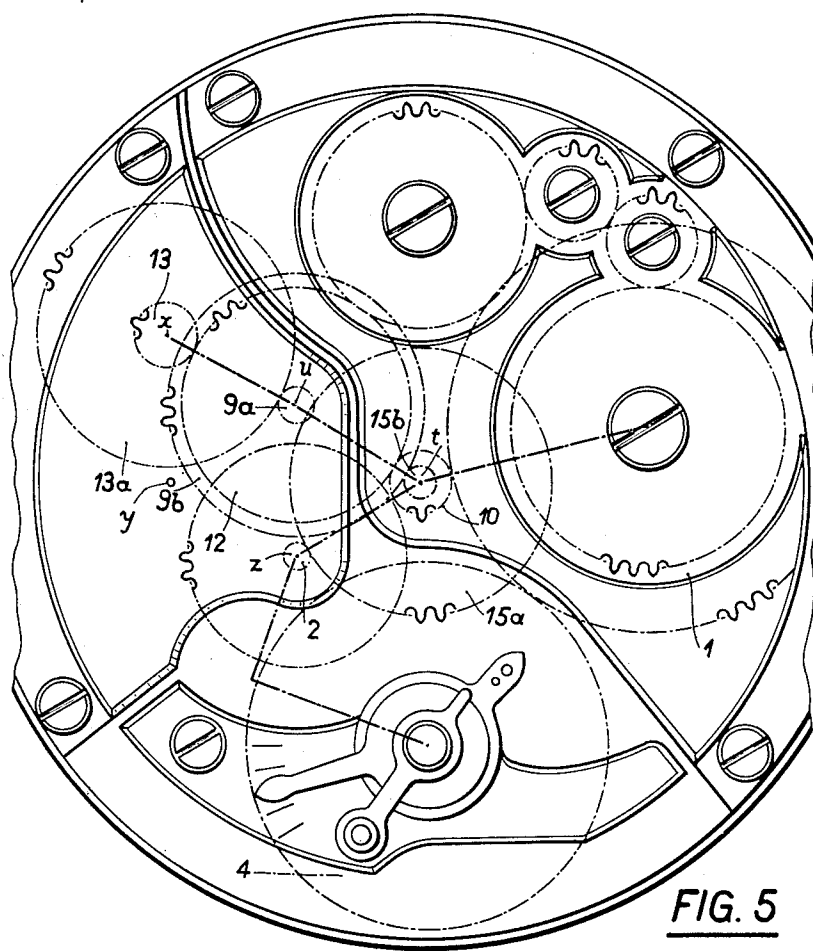


FIG. 5

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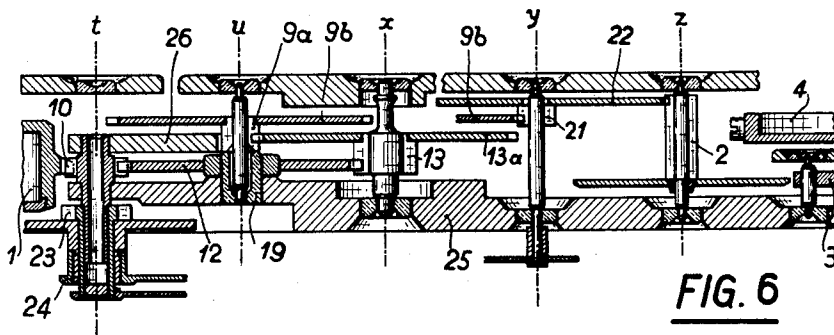


FIG. 6

FIG. 7

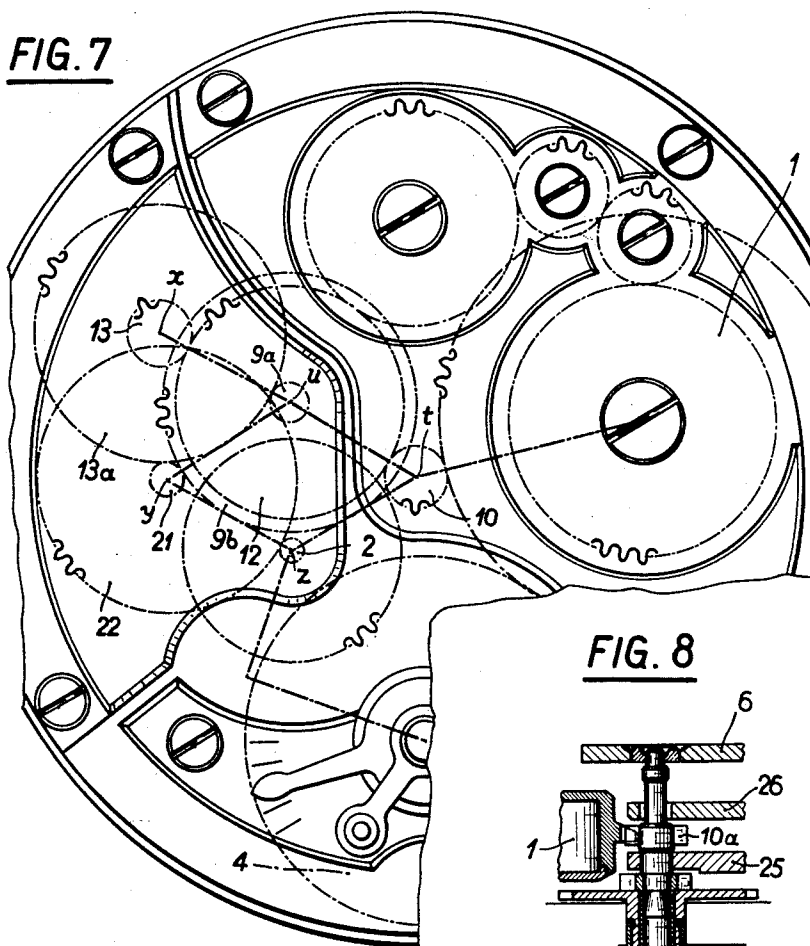
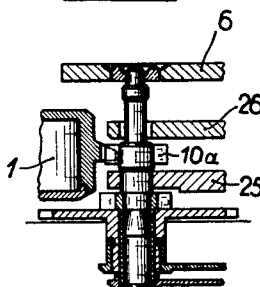


FIG. 8



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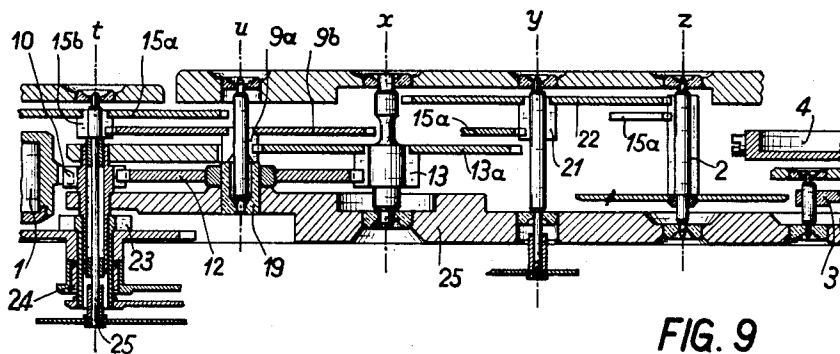
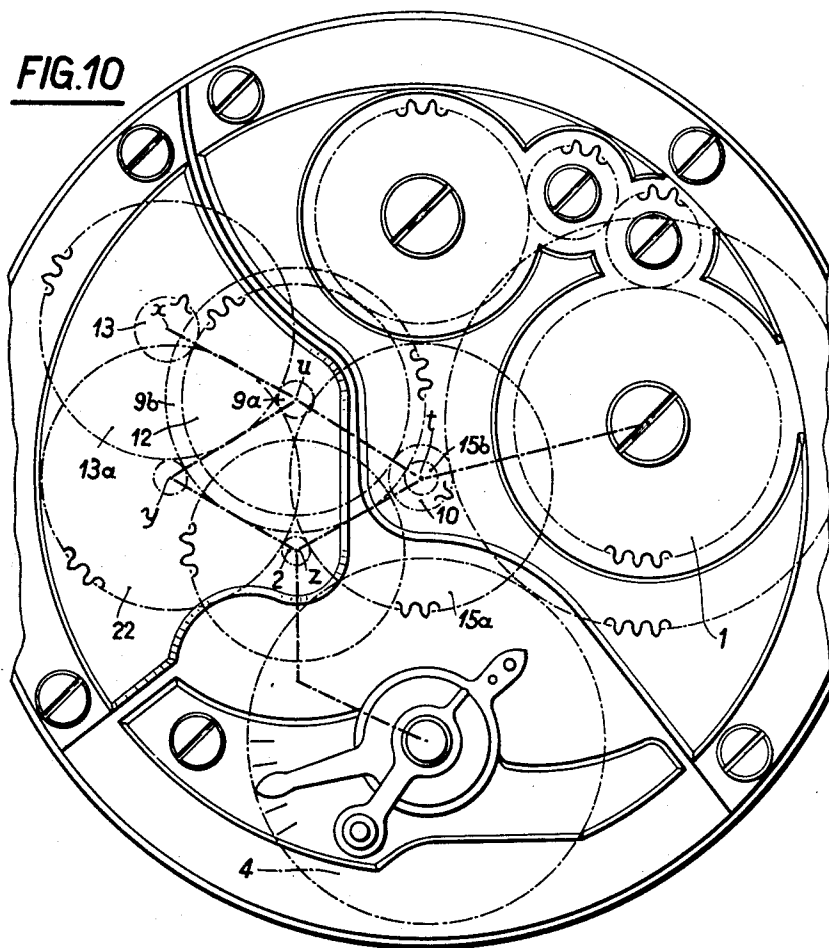


FIG. 9

FIG. 10



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WATCH MOVEMENT

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Application June 15, 1955, Serial No. 515,753

Claims priority, application Switzerland June 17, 1954

8 Claims. (Cl. 58—59)

My invention has for its object a watch movement provided with a seconds hand which is either eccentric or coaxial with the watch. According to my invention, the barrel controls the third wheel through three gears, to wit a center wheel pinion, an intermediate wheel and the minute wheel, the geometrical axis of which registers with that provided for an eccentric seconds wheel while the third wheel on the one hand and the escape wheel on the other hand have their axes lying at equal distances from the central axis and the axis of the minute wheel, to provide for a selective location of the seconds wheel on either of the last mentioned axes.

I have illustrated by way of example in accompanying drawings three preferred embodiments of my invention. In said drawings:

Fig. 1 is a general plan view of the first embodiment as seen from the plate side.

Fig. 2 is a vertical section on a larger scale through line A—B—C—D—E—F of Fig. 1.

Fig. 3 is a diagrammatical plan view of a part of the train.

Figs. 4 to 8 relate to a second embodiment to be used either with a central seconds hand or with an ordinary eccentric seconds hand; more specifically, Figs. 4 and 5 illustrate cross-sectionally and in plan view said embodiment as incorporating a central seconds hand whereas Figs. 6 and 7 are similar views corresponding to the incorporation of an ordinary seconds hand.

Fig. 8 illustrates a detail modification.

Figs. 9 and 10 relate to a third embodiment adapted to be used with a central seconds hand or with a conventional eccentric seconds hand or with both types of seconds hand. Fig. 9 is a sectional view and Fig. 10 a plan view of this third embodiment.

The first embodiment illustrated includes a barrel 1 connected through the gearing described hereinafter with the escape wheel 2, which latter controls the anchor 3. 4 designates the balance wheel, 5 the barrel-bridge, 6 the train wheel bridge and 7 the balance cock.

The teeth 8 on the barrel 1 control the third wheel 9 through the agency of three gears, to wit the center wheel pinion carrying a center wheel pinion 10 mounted at the center of the movement and controlling the minute hand 11, an intermediate gear 12 and the minute wheel 13. The pipe on the center wheel pinion 10 forms an axial bore 14, inside which may revolve the spindle carrying the gear 15 rigid with the central seconds hand 16. Similarly, the spindle of the minute wheel 13 is provided with a central bore inside which may revolve the spindle 17 carrying the conventional eccentric seconds gear 18. The wheel 18a for this eccentric seconds hand and the wheel 15a for the central seconds wheel mesh both with the escape wheel 2.

It will be noticed that the axis of the third wheel 9 lies at equal distances from the central axis passing through the gear 15 and from the common axis for the minute wheel 13 and the conventional eccentric seconds

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gear 18. Similarly, the axis of the escape wheel is at equal distances from the last mentioned axes and from the central axis. As illustrated in the drawing, the four distances are practically equal so that the four axes considered are located at the apices of a rhombus.

The intermediate wheel 12 revolves round the geometrical axis of the third wheel and for this purpose it is mounted over the periphery of the bearing 19 inside which is revolubly mounted the lower end of the said third wheel.

In the drawing, the movement is provided with a central seconds hand and with a conventional eccentric seconds hand. Removal of the gear 15 will produce a movement with an ordinary eccentric seconds hand and conversely removal of the movable gear 18 will lead to a movement provided only with a central seconds hand.

In Figs. 4 to 7 which illustrate the second embodiment, 1 designates again the barrel the teeth of which mesh with a center wheel pinion 10 adapted to revolve round the geometrical axis *t*. Said center wheel pinion 10 carries a socket or pipe on which is fitted frictionally the cannon pinion 23 and round which the hour wheel 24 provided with a pipe revolves. Said center wheel pinion 10 meshes with an intermediate wheel 12 adapted to revolve round the axis *u* and meshing with the pinion 13 rigid with the minute wheel 13a and revolving round the axis *x* while said wheel 13a meshes with the pinion 9a rigid with the third wheel gear 9. The latter revolves round the last mentioned axis *u* and its wheel 9b meshes with the pinion 15b of the gear 15 carrying the central seconds hand. Last mentioned gear is rigid with a spindle 25 extending through the pipe on the center wheel pinion 10 and carrying the central seconds hand 16. Its wheel 15a meshes with the pinion of the escape gear which revolves round the axis *z* and controls the balance wheel 4 through the agency of the anchor 3. There is provided on the frame a location for the conventional eccentric seconds wheel revolving round an axis *y* (Fig. 5), which location is unoccupied in the case illustrated in Figs. 4 and 5. Reference character 25 designates the main plate of the watch, 6 the train wheel bridge and 5 the barrel bridge. 26 designates an intermediate plate revolubly carrying the center wheel pinion 10 and limiting the axial movements of the intermediate wheel 12. Said intermediate wheel revolves over the bearing 19. As to the third wheel, it revolves between said bearing and the train wheel bridge.

In the modification illustrated in Figs. 6 and 7, there is no central gear carrying the seconds hand. In contradistinction, the conventional seconds gear is provided eccentrically as usual for carrying the seconds hand. It revolves round its axis *y* and its pinion 21 meshes with the third wheel 9b while its wheel 22 meshes in its turn with the pinion of the escape gear. Obviously, the axes *u* and *z* are arranged at equal distances from the axes *t* and *y*.

It will be noticed that the intermediate, minute, third and escape wheels when projected orthogonally onto the plane of the watch plate lie outside the orthogonal projection of the barrel drum 1. In particular, the orthogonal projections of the intermediate wheel and of the barrel on said plate plane do not cut each other.

In the embodiment illustrated in Fig. 7, there is no central seconds gear and consequently the center wheel pinion 10 with its pipe may be replaced as shown in Fig. 8 by a center wheel pinion 10a having a solid spindle and revolving inside the plate 5 and inside the barrel bridge 6, said solid spindle extending freely through the intermediate plate 26.

The center wheel pinion 10 and the minute wheel 13 may include the same number of teeth. However, and according to the size of the movement, the number of

said teeth may be different for said center wheel pinion 10 and minute wheel 13 whereby it is possible to execute the latter by means of cores and spindles of a sufficient diameter or else to obtain a better definition of the gears on the train wheel bridge.

In the case of last mentioned embodiment and by reason of the small height of the movement, it is impossible to incorporate into the movement both the central seconds wheel and the conventional eccentric seconds wheel, since said seconds wheels would interfere with each other.

In the embodiment illustrated in Figs. 9 and 10 where more space is available in a vertical direction, the two seconds wheels no longer interfere and it is possible to use the movement indifferently with the central seconds wheel alone or with the conventional eccentric seconds wheel alone or with both said wheels together. Said latter arrangement is illustrated in Figs. 9 and 10: the two seconds wheels 15a and 22 mesh with the escape pinion, one of them controlling the latter selectively while the other is slightly shifted angularly.

What I claim is:

1. In a watch movement, the combination of a toothed barrel, a center wheel pinion controlled by the barrel teeth, an intermediate wheel controlled by the center wheel pinion, a minute wheel controlled by the intermediate wheel, a third gear including a wheel and a pinion controlled by the minute wheel and coaxial with the intermediate wheel, two seconds wheels each removably positioned with its axis in register with the center wheel pinion and with a predetermined eccentric location respectively, for operative engagement with said wheel of the third gear and an escape wheel adapted to engage either operatively positioned seconds wheel and the distance of the axis of which from the axis of the center wheel pinion is equal to that between last mentioned axis and the axis of the third wheel, the eccentric location for the axis of a seconds wheel lying at equal distances from the axis of the escape wheel and from the axis of the third wheel.

2. In a watch movement, the combination of a toothed barrel, a center wheel pinion controlled by the barrel teeth, an intermediate wheel controlled by the center wheel pinion, a minute wheel controlled by the intermediate wheel, a third gear including a wheel and a pinion controlled by the minute wheel and coaxial with the intermediate wheel, two seconds wheels each removably positioned with its axis in register with the center wheel pinion and with the minute wheel respectively, for operative engagement with said wheel of the third gear and an escape wheel adapted to engage either operatively positioned seconds wheel and the distance of the axis of which from the axis of the center wheel pinion is equal to that between the last mentioned axis and the axis of the third wheel, the axis of the minute wheel lying at equal distances from the axis of the escape wheel and from the axis of the third wheel.

3. In a watch movement, the combination of a toothed barrel, a center wheel pinion controlled by the barrel teeth and having a bore therethrough, an intermediate wheel controlled by the center wheel pinion, an axially bored minute wheel controlled by the intermediate wheel, a third gear including a wheel and a pinion controlled by the minute wheel and coaxial with the intermediate wheel, two seconds wheels adapted to be revolvably fitted respectively in the bore of the center wheel and in the bore of the minute wheel for operative engagement with said wheel of the third gear and an escape wheel adapted to engage either operatively positioned seconds wheel and the distance of the axis of which from the axis of the center wheel pinion is equal to that between last mentioned axis and the axis of the third wheel, the axis of the minute wheel lying at equal distances from the axis of the escape wheel and from the axis of the third wheel.

4. In a watch movement, the combination of a toothed

barrel, a center wheel pinion controlled by the barrel teeth, an intermediate wheel controlled by the center wheel pinion, a minute wheel controlled by the intermediate wheel, a third gear including a wheel and a pinion controlled by the minute wheel and coaxial with the intermediate wheel, two seconds wheels each removably positioned with its axis in register with the center wheel pinion and with an eccentric location respectively for operative engagement with said wheel of the third gear and an escape wheel adapted to engage either operatively positioned seconds wheel and the distance of the axis of which from the axis of the center wheel pinion is equal to that between last mentioned axis and the axis of the third wheel, the eccentric location for the axis of the seconds wheel lying at equal distances from the axis of the escape wheel and from the axis of the third wheel, the two seconds wheels when positioned simultaneously lying entirely outside the path of each other.

5. In a watch movement, the combination of a toothed barrel, a center wheel pinion controlled by the barrel teeth, an intermediate wheel controlled by the center wheel pinion, a minute wheel controlled by the intermediate wheel, a third gear including a wheel and a pinion controlled by the minute wheel and coaxial with the intermediate wheel, at least one seconds wheel, dual means for removably fitting a seconds wheel coaxially with the center wheel pinion and with the minute wheel respectively, for operative engagement with said wheel of the third gear and an escape wheel adapted to engage the operatively positioned seconds wheel and the distance of the axis of which from the axis of the center wheel pinion is equal to that between the last mentioned axis and the axis of the third wheel, the axis of the minute wheel lying at equal distances from the axis of the escape wheel and from the axis of the third wheel.

6. In a watch movement, the combination of a toothed barrel, a center wheel pinion controlled by the barrel teeth, an intermediate wheel controlled by the center wheel pinion, a minute wheel controlled by the intermediate wheel, a third gear coaxial with the intermediate wheel and including a wheel and a pinion controlled by the minute wheel and coaxial with the intermediate wheel, at least one seconds wheel, dual means for removably fitting a seconds wheel coaxially with the center wheel pinion and with the minute wheel respectively, for operative engagement with said wheel of the third gear and an escape wheel adapted to engage the operatively positioned seconds wheel and the distance of the axis of which from the axis of the center wheel pinion is equal to that between last mentioned axis and the axis of the third wheel, the axis of the minute wheel lying at equal distances from the axis of the escape wheel and from the axis of the third wheel.

7. In a watch movement, the combination of a toothed barrel, a center wheel pinion controlled by the barrel teeth, an intermediate wheel controlled by the center wheel pinion, a minute wheel controlled by the intermediate wheel, a third gear including a wheel and a pinion controlled by the minute wheel and coaxial with the intermediate wheel, a spindle for the third gear, a bearing for the lower end of the latter and on which the intermediate wheel is revolvably carried coaxially with said spindle, two seconds wheels each removably positioned with its axis in register with the center wheel pinion and with the minute wheel respectively, for operative engagement with said wheel of the third gear and an escape wheel adapted to engage either operatively positioned seconds wheel and the distance of the axis of which from the axis of the center wheel pinion is equal to that between last mentioned axis and the axis of the third wheel, the axis of the minute wheel lying at equal distances from the axis of the escape wheel and from the axis of the third wheel.

8. In a watch movement, the combination of a toothed barrel, a center wheel pinion controlled by the barrel teeth, an intermediate wheel controlled by the center

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wheel pinion, a minute wheel controlled by the intermediate wheel, a third gear including a wheel and a pinion controlled by the minute wheel and coaxial with the intermediate wheel, two seconds wheels each removably positioned with its axis in register with the center wheel pinion and with the minute wheel respectively, for operative engagement with said wheel of the third gear and an escape wheel adapted to engage either operatively positioned seconds wheel and the distance of the axis of which from the axis of the center wheel pinion is equal 10 to that between last mentioned axis and the axis of the

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third wheel, the axis of the minute wheel lying at equal distances from the axis of the escape wheel and from the axis of the third wheel and the two seconds wheels when positioned simultaneously lying entirely outside the path of each other.

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