Nov. 20, 1962 R. POLO 3,064,415

ARRANGEMENT FOR THE WINDING AND TIME-SETTING OF A WATCH

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FIG. 2

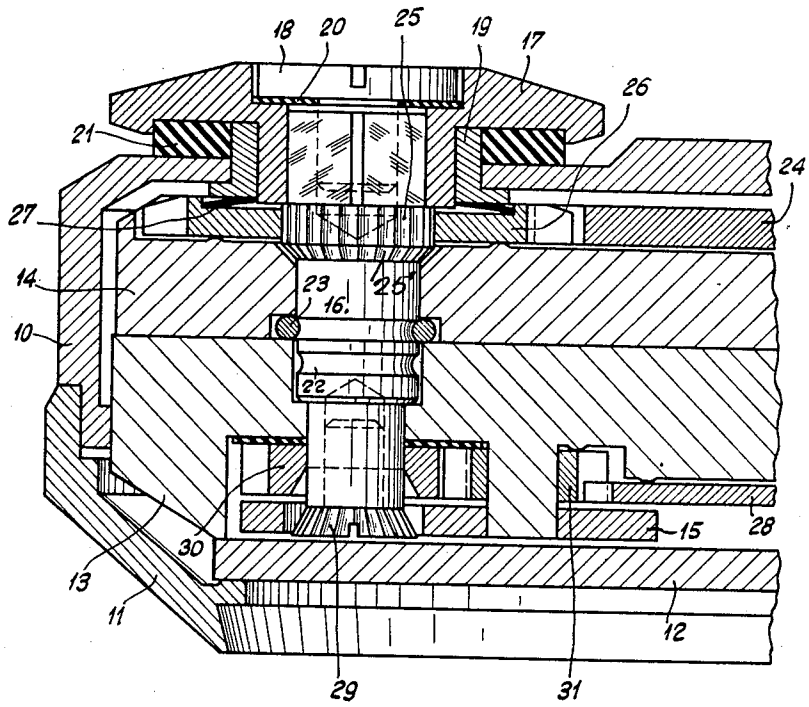


FIG. 1

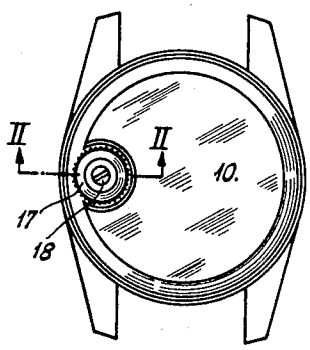
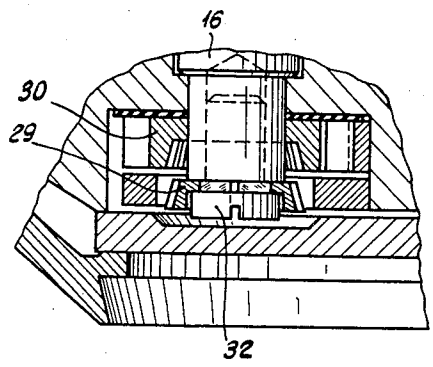


FIG. 3



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FIG. 4

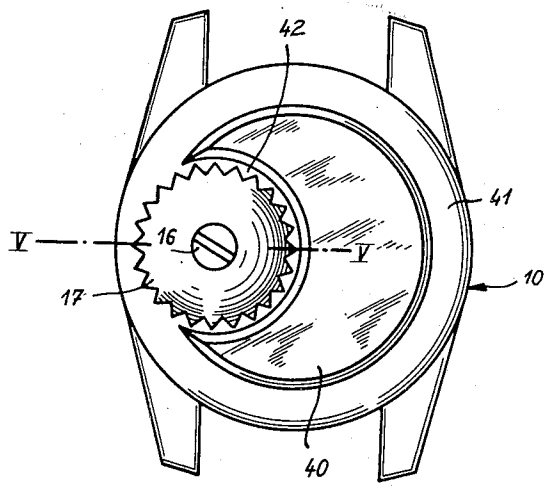
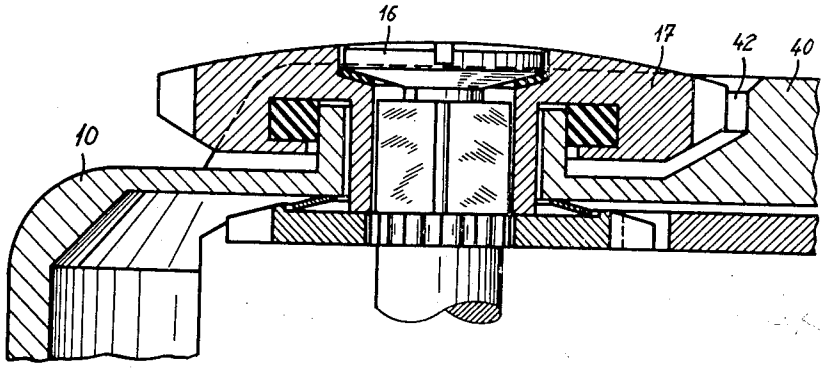


FIG. 5



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ARRANGEMENT FOR THE WINDING AND TIME-SETTING OF A WATCH

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4 Claims. (Cl. 58—63)

The present invention has for its object an arrangement for the winding and time-setting of a watch including a winding stem arranged perpendicularly to the plane of the movement and adapted to occupy at least two axially shifted positions.

According to the invention, the winding stem is provided with two series of teeth meshing respectively, according to the axial position of the stem, with either of two inner series of teeth arranged coaxially with the stem, one of said inner series carried by a transmission wheel operatively connected to the mainspring-barrel, and the other of said inner series carried by a wheel operatively connected with the setting pinion.

The accompanying drawings illustrate, by way of example, a preferred embodiment of this improved arrangement together with two modification thereof. In said drawings:

FIG. 1 is a plan view of the watch as seen from the bottom side.

FIG. 2 is a cross-sectional view on a larger scale through line II—II of FIG. 1.

FIG. 3 is a cross-sectional view of a modification of the winding stem.

FIG. 4 is a plan view of a modification of the case.

FIG. 5 is a cross-section through line V—V of FIG. 4.

The watch illustrated is a wrist watch, the case of which includes a case band **10** rigid with the bottom and a rim **11**. The dial is designated by the reference **12**, the movement carrying plate by **13**, the barrel bridge by **14** and the bridge carrying the setting or intermediate wheels by **15**.

The means for winding said watch include a winding stem **16** arranged perpendicularly to the plane of the movement. Said stem, which is revolvably carried at the periphery of the movement on the plate **13** and the bridge **14** extends through the bottom section of the case **10**. The stem is controlled by a flat crown wheel or winding knob **17** which is partly fitted inside the case band **10** and secured to a square section of the stem **16** by means of an axial screw **18**. Said crown wheel revolves inside a socket **19** driven into the bottom **10**, while fluid tightness is ensured by two packings **20** and **21** engaging opposite sides of said crown wheel.

The stem **16** may occpuy, after the manner of a conventional winding stem, two axial positions corresponding respectively to the winding and to the time-setting. Said two positions are defined by two annular grooves **22** formed in the periphery of the stem **16** and by an annular spring **23** adapted to engage selectively one of said grooves.

The kinematic connection between the winding stem **16** and the ratchet wheel formed on the barrel **24** includes a cylindrical series of teeth **25** cut in the body of the stem **16** the lower end **25'** of which is bevelled and a transmission wheel **26** surrounding the stem **16** and provided, in one position with an inner series of teeth meshing with the teeth **25** on said stem when the latter is in its axial position illustrated and, with outer teeth meshing permanently with the ratchet wheel **24**. The transmission wheel **26** rests on the bridge **14** and is held in position by a spring washer **27**. The kinematic connection between the stem **16** and the gear **28** forming part of the motion work is ensured by the bevel teeth **29** on the stem **16**, a wheel **30** carried loosely by the stem **16** and provided

with an inner series of bevel teeth engaging the bevel teeth **29** on the stem **16** when the latter is in its second position and, lastly, a transmission gear **31** forming part of the driving mechanism and meshing permanently with the outer teeth provided on the wetting pinion **30**, said gear **31** meshing also permanently with the gear **28**. The teeth **29** are cut in the head of a screw screwed into the inner end of the stem **16**. All the teeth referred to are sharp.

FIG. 3 shows a modification of the stem **16** according to which the teeth **29** are cut in a washer rigidly secured to the end of the stem **16** by a screw **33**.

Obviously, the invention is not limited to the arrangement described and illustrated and, in particular, the bevel teeth may, in both cases illustrated, be replaced by sprocket teeth.

FIGS. 4 and 5 illustrate a modified arrangement for the mounting of the crown wheel in the bottom of the case.

The latter includes a central outwardly projecting section **40** in its bottom and an annular section **41** surrounding said projecting section and extending inwardly into a portion of the latter as defined by the arcuate line **42**. Said inward extension forms a recess housing the knob **17**, of which the periphery projects partly over the actual annular section **41**. Thus, said crown wheel does not project beyond the projecting section of the bottom of the case and it may be actuated readily through mere engagement on one's finger over the part of the crown wheel lying under the annular section **41** and shifting of said finger in either direction as required. The section **41** of the case bottom is obtained readily through turning of the latter; the arrangement just disclosed gives the impression of a watch which is flatter than it actually is.

What I claim is:

1. In a watch, the combination of a movement including a barrel, a case band including a bottom, means carrying the movement inside the case band, a winding and time-setting stem carried by the case band bottom, extending perpendicularly to the plane of the movement and adapted to be shifted between two axially spaced extreme positions, two axially spaced annular series of radially projecting peripheral teeth said annular series being coaxial with said stem, on said stem a control knob rigid with the stem on the outside of the case band bottom, two axially spaced transmission wheels carried by said means coaxially with the stem and including each a series of inner radially projecting teeth and a series of outer radially projecting teeth, the inner teeth of one transmission wheel surrounding and engaging one of the series of pheripheral teeth on the stem in one extreme position of the latter, the inner teeth of the other transmission wheel surrounding and engaging the other one of the series of peripheral teeth on the stem in the other extreme position of the latter, the outer teeth of one transmission wheel being permanently and operatively connected with said barrel and the outer teeth on the other transmission wheel being permanently and operatively connected with said movement for time-setting purposes.

2. In a watch, the combination of a movement including a barrel, a case band including a bottom, means carrying the movement inside the case band, a winding and time-setting stem carried by the case band bottom, extending perpendicularly to the plane of the movement and adapted to the shifted between two axially spaced extreme positions, two axially spaced annular series of radially projecting peripheral teeth, of which one series is bevelled, said annular series being coaxial with said stem, a control knob rigid with the stem on the outside of the case band bottom, two axially spaced transmission wheels carried by said means coaxially with the stem and including each a series of inner radially projecting teeth and a series of

outer radially projecting teeth, the inner teeth of one transmission wheel surrounding and engaging one of the series of peripheral teeth on the stem in one extreme position of the latter, the inner teeth of the other transmission wheel surrounding and engaging the other one of the series of pheripheral teeth on the stem in the other extreme position of the latter, the inner teeth of said other wheel cooperating with said one series of peripheral teeth being similarly bevelled, the outer teeth of one transmission wheel being permanently and operatively connected with said barrel and the outer teeth on the other transmission wheel being permanently and operatively connected with said movement for time-setting purposes.

3. In a watch, the combination of a movement including a barrel, a case band including a bottom, means carrying the movement inside the case band, a winding and time-setting stem carried by the case band bottom, extending perpendicularly to the plane of the movement and adapted to be shifted between two axially spaced extreme positions, two axially spaced annular series of radially projecting peripheral teeth coaxial with said stem of which one series is bevelled and the other is bevelled at its end facing said one series, a control knob rigid with the stem on the outside of the case band bottom, two axially spaced transmission wheels carried by said means coaxially with the stem and including each a series of inner radially projecting teeth and a series of outer radially projecting teeth, the inner teeth of one transmission wheel surrounding and engaging one of the series of peripheral teeth on the stem in one extreme position of the latter, the inner teeth of the other transmission wheel surrounding and engaging the other one of the series of peripheral teeth on the stem in the other extreme position of the latter, the inner teeth of said other wheel cooperating with said one series of peripheral teeth being similarly bevelled, the outer teeth of one transmission wheel being permanently and operatively connected with said barrel

and the outer teeth on the other transmission wheel being permanently and operatively connected with said movement for time-setting purposes.

4. In a watch, the combination of a movement including a barrel, a case band including a bottom having a circular recess means carrying the movement inside the case band, a winding and time-setting stem carried by the case band bottom, extending perpendicularly to the plane of the movement and adapted to be shifted between two axially spaced extreme positions, two axially spaced annular series of radially projecting peripheral teeth coaxial with said stem, a control knob rigid with the stem rotatably carried outside the case bottom with its periphery engaging said recess and with its outer surface substantially flush with the outer surface of the bottom of the case, two axially spaced transmission wheels carried by said means coaxially with the stem and including each a series of inner radially projecting teeth and a series of outer radially projecting teeth, the inner teeth of one transmission wheel surrounding and engaging one of the series of peripheral teeth on the stem in one extreme position of the latter, the inner teeth of the other transmission wheel of surrounding and engaging the other one of the series of peripheral teeth on the stem in the other extreme position of the latter, the outer teeth of one transmission wheel being permanently and operatively connected with said barrel and the outer teeth on the other transmission wheel being permanently and operatively connected with said movement for time-setting purposes.

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