March 26, 1963 H. STAMM ET AL 3,082,594

DRIVING MECHANISM FOR THE DATE INDICATOR IN A CALENDAR WATCH

Filed May 8, 1961

2 Sheets-Sheet 1

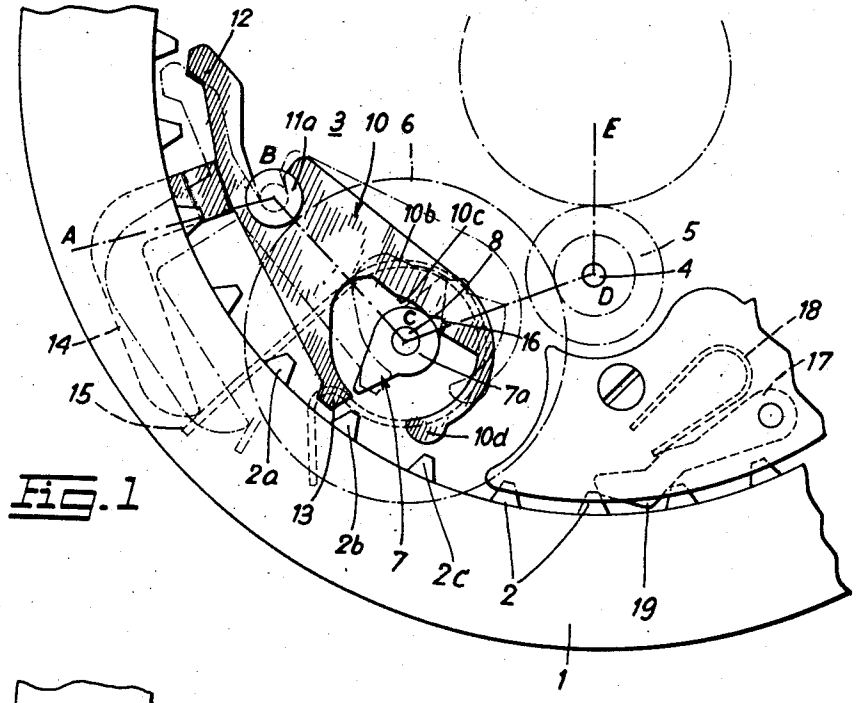


Fig. 1

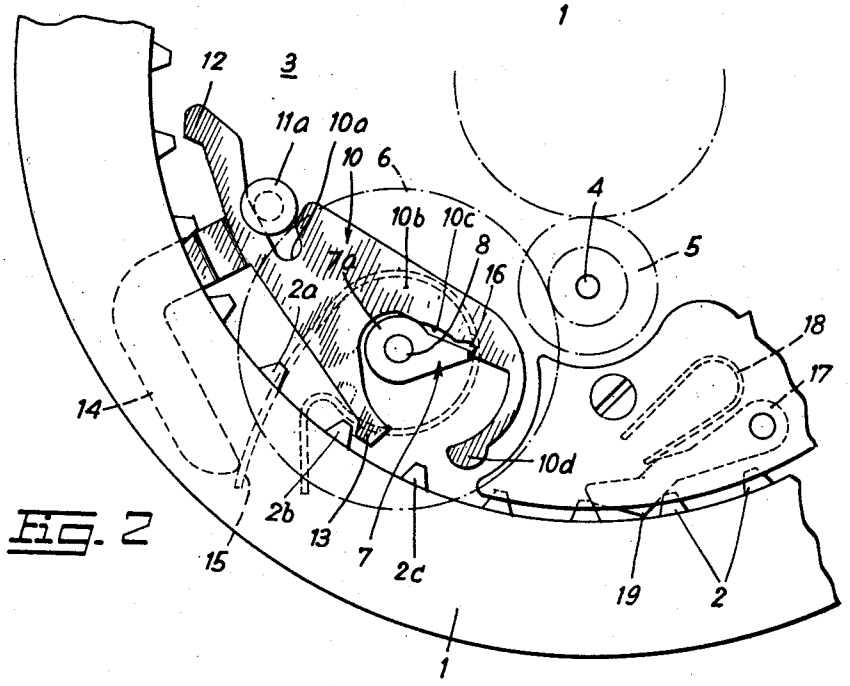


Fig. 2

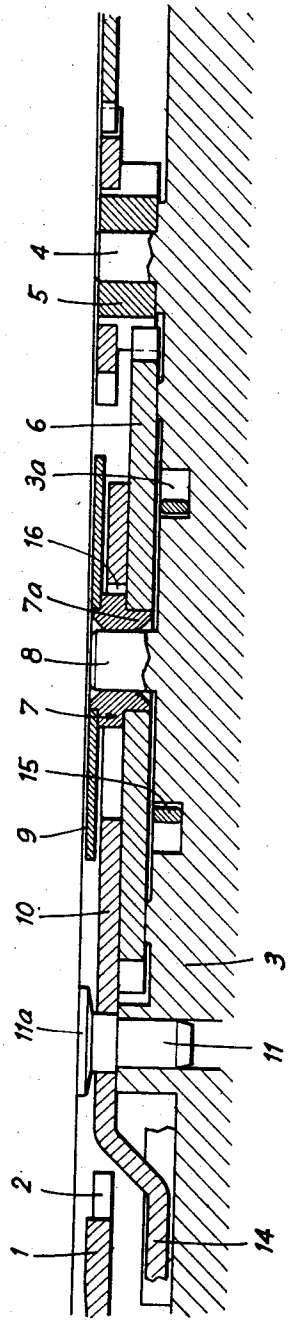
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Fig. 3



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DRIVING MECHANISM FOR THE DATE INDICATOR IN A CALENDAR WATCH

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4 Claims. (Cl. 58—58)

This invention relates to driving mechanisms for the date indicator in calendar watches and in particular to driving mechanisms comprising a driving member controlled by a rotating finger.

Most of the driving mechanisms of that type, which are known in the art, have the drawback that the date indicator does not jump from one indicating position into the next one, but moves progressively forward during a couple of hours. Since the indications carried by said indicator generally appear one at the time in a window of the watch dial, the date can no longer be read during the time required for the date indicator to pass from one indicating position to the next one.

Driving mechanisms ensuring a sudden jump of the date indicator have already been proposed in the art. These known mechanisms generally comprise, however, intricate and therefore delicate elements. Several attempts have been made in order to simplify the construction, but the driving mechanisms produced thereby have nevertheless the drawback that they comprise at least a piece extending over a substantial portion of the dial side of the watch movement thereby causing a substantial increase of the total height thereof.

It is therefore an object of this invention to provide a driving mechanism of the type in which the date indicator jumps from one indicating position to the next one.

Another object of the invention is to provide a driving mechanism of the type mentioned above in which the different members of said mechanism are located only in the vicinity of the date indicator thus leaving the central portion of the watch movement entirely free for the usual motion work and other components of this watch movement.

A more specific object of the invention is to provide said driving mechanism with a driving member constituted by a free plate capable both of rocking about and of shifting along a guiding pin under the action of spring means, said plate comprising a camming surface cooperating with a rotating finger of said driving mechanism.

Still further objects of the invention will become apparent in the course of the following description.

One embodiment of the driving mechanism according to this invention is represented diagrammatically and by way of example in the drawings annexed hereto.

In the drawings:

FIG. 1 is a plan view of said embodiment showing two different working positions, a cover member of said mechanism being removed;

FIG. 2 is a plan view similar to that of FIG. 1 showing a third working position, and

FIG. 3 is a cross-sectional view along line A, B, C, D, E of FIG. 1 on a somewhat larger scale.

The driving mechanism represented in the drawings comprises a date indicator constituted by a ring **1** provided with an inner toothing **2**. Ring **1** is mounted for rotary motion on the base plate **3** (FIG. 3) of the framework of a calendar watch. A pin **4** projecting from the dial side of base plate **3** serves as a pivot for an intermediate gear **5** which is driven by the motion work of the watch. Gear **5** meshes with a driving wheel **6** riveted on to a sleeve **7***a* made integral with a finger **7**. Sleeve

7*a* is freely pivoted on a pin **8** of base plate **3**. A plate **9** serving as a cover for the driving mechanism of ring **1** is rigidly fixed on to the upper portion of sleeve **7***a*, thus limiting the axial play of a driving plate **10**. The latter extends between cover member **9** and wheel **6** and it is located on the same level as finger **7**. This plate is provided with a slot **10***a* engaging a guiding pin **11** fixed to base plate **3**. Pin **11** is provided at its upper portion with a head **11***a* to retain plate **10** axially in place. The latter is further provided with a first tooth **12** extending on the side of guiding pin **11** which is opposed to finger **7**. Tooth **12** is arranged for engaging the toothing **2**. Plate **10** is further provided with a second tooth **13** also arranged for cooperation with toothing **2** and extending between finger **7** and said toothing. Plate **10** is still further provided with a projection **10***b* carrying a camming surface **10***c* opposite finger **7** and ending with a resilient arm **10***d* which is arcuate and directed towards tooth **13**. The distance from the free end of arm **10***d* to tooth **13** is somewhat smaller than the diameter of sleeve **7***a*. Plate **10** finally comprises a projection **14** bent downward and extending below ring **1**. A spring **15**, located in a recess **3***a* of base plate **3**, acts on the free end of projection **14** so as to urge plate **10** towards guiding pin **11**. Under the action of spring **15** plate **10** tends to rest in such a position that the end face of slot **10***a* bears against pin **11** and that plate **10** tends to pivot clockwise around said pin, as shown in FIG. 1.

The projection **10***b* of plate **10**, which is provided with the camming surface **10***c*, extends on the side of finger **7** which is opposed to toothing **2** with respect to the plane passing through the axes of pin **11** and finger **7**. The finger **7** is thus located in a space comprised between tooth **13** and camming surface **10***c*. As shown in FIG. 1, the camming surface **10***c* extends across the path of finger **7**. It moreover comprises an indentation **16** at its end directed towards arm **10***d*, so that finger **7** cooperates with said indentation when it rotates clockwise and leaves camming surface **10***c*.

The driving mechanism according to the invention further comprises a detent **17** the free end of which engages toothing **2** under the action of a spring **18**. Detent **17** is provided with a triangular end portion **19** which is fully engaged between two teeth of toothing **2** by spring **18**.

During the greater portion of the day the driving mechanism described rests in the position represented in full lines in FIG. 1. Tooth **12** is removed from toothing **2** while tooth **13** is disposed in the gap formed between the two teeth **2***a* and **2***b*. Plate **10** remains in this rest position as long as finger **7** does not come into contact with the camming surface **10***c*. It will be observed that finger **7**, which is driven by the watch movement through the intermediate gear **5** and wheel **6**, makes one complete revolution in twenty-four hours. In said rest position spring **15** presses the end face of slot **10***a* against the driving pin **11** and the camming surface **10***c* against the sleeve **7***a* of finger **7**. When the end portion of finger **7** comes in contact with the camming surface **10***c*, it causes plate **10** to rock counterclockwise around pin **11** while bending spring **15**. Tooth **12** enters a gap between two teeth of toothing **2** while tooth **13** is removed from said toothing. Plate **10** thus progressively comes into the position represented in do-and-dash lines in FIG. 1. The spring-pressed detent **17**—**19** and tooth **12** prevent ring **1** from rotating accidentally. Thus, tooth **12** acts as a safety as regards the correct motion of ring **1**.

When finger **7** moves on clockwise, its end engages the identation **16** and causes plate **10** to shift towards the right in FIG. 1 while bending spring **15** move. The sizes of the different pieces of the driving mechanism, ac-

cording to the invention, are chosen in such a manner that said shifting motion of plate **10** proceeds until tooth **13** has reached a position opposite the gap between teeth **2***b* and **2***c* of toothing **2**. In that position of plate **10** finger **7** still engages indentation **16**. When continuing its rotation finger **7** thus causes plate **10** to rotate clockwise around pin **11** while still remaining in engaged condition with respect to indentation **16**. During the last rocking motion of plate **10**, tooth **13** of the latter enters the gap comprised between teeth **2***b* and **2***c* while tooth **12** is removed from toothing **2**. At that moment only fiinger **7** leaves indentation **16**. Plate **10** is then fully abandoned to the action of spring **15** which causes it to move in a jumping motion towards the left in FIG. 1. During this jumping motion, the camming surface **10***c* slides against sleeve **7***a*. Plate **10** moves until the end face of slot **10***a* butts against pin **11**. During this jumping motion of plate **10**, tooth **13**, which entered the gap between teeth **2***b* and **2***c*, catches tooth **2***b* and causes ring **1** to rotate suddenly through a predetermined angle which is greater than half the circular pitch of toothing **2**. One tooth of ring **1** accordingly moves beyond the free end **19** of detent **17** so that the latter causes ring **1** to rotate further on until detent **17—19** is again fully engaged between two teeth of toothing **2** under the action of spring **18**.

It will be observed that the resilient arm **10***d* of plate **10** substantially simplifies assembling the driving mechanism according to the invention. Since sleeve **7***a* of finger **7** can only be passed through the gap formed between tooth **13** and the end of the resilient arm **10***d* by urging the latter away from said tooth, the plate **10** can be set around sleeve **7***a* before mounting the latter into the watch movement, thus forming a single assembling unit therewith. Arm **10***d* thus delimits a space in which the sleeve **7***a* of finger **7** is disposed.

With the improved driving mechanism described above, the date indicator constituted by ring **1** always jumps from one indicating position to the next one so that the date can be correctly read at any time, thus preventing two figures carred by ring **1** from appearing simultaneously in the dial window of the watch. Moreover, the driving mechanism, according to the invention, is wholly located in the vicinity of the toothing **2** of ring **1** so that the different pieces of this mechanism cannot interfere with the other watch elements, for instance, those of the motion work.

While one embodiment of the invention has been described in detail with reference to the accompanying drawings, it should be understood that various changes in the shape, sizes and arrangement of parts will appear obvious to those skilled in the art within the scope of the appended claims without departing from the spirit of the invention or sacrificing the advantages thereof.

We claim:

1. In a calendar watch having a ring-shaped date indicator provided with an inner toothing, means for producing a step-by-step drive of said indicator and comprising a guiding pin, a driving member mounted both for sliding motion along said pin and for rocking motion about said pin, spring means acting on said driving member to maintain it normally in a predetermined resting position and, upon a displacement of the driving member away from its predetermined resting position, to bring it back into this resting position first by rocking the same around said guiding pin and then by sliding it therealong, a driving tooth on said driving member engaging the inner toothing of the date indicator when said driving member is in said predetermined position around said guiding pin, said driving tooth leaving said toothing upon a rocking motion of said driving member against the action of said spring means and said driving tooth moving in a tangential direction with respect to said toothing when said driving member slides along the guiding pin, a control finger mounted for rotary motion and normally driven continuously in the same direction, a camming surface on said driving member extending in the path of said control finger and causing said driving member to rock around said guiding pin against the action of said spring means when said camming surface is engaged by said control finger, and an indentation provided on said driving member and located in the path of said control finger, said control finger causing said driving member to slide along said guiding pin when this control finger engages said indentation.

2. In a calendar which according to claim 1, said control finger comprising a hub portion and said driving member abuttingly engaging said hub portion when it has been moved in said predetermined position under the action of said spring means.

3. In a calendar watch according to claim 1, said driving member further comprising a resilient arm extending from said camming surface toward said driving tooth and having a free end spaced at a distance from said driving tooth thereby defining a smaller diameter than the diameter of a hub portion of said control finger, said driving tooth, said camming surface and said resilient arm thereby enclosing a space in which said hub portion of the control finger is disposed.

4. In a calendar watch having a ring-shaped date indicator provided with an inner toothing, means for producing a step-by-step drive of said indicator and comprising a guiding pin, a driving member mounted both for sliding motion along said pin and for rocking motion about said pin between a first and a second predetermined position, spring means acting on said driving member to maintain it normally in a predetermined resting position and, upon a displacement of the driving member away from its predetermined resting position, to bring it back into this resting position first by rocking the same around said guiding pin and then by sliding it therealong, a driving tooth on said driving member engaging the inner toothing of the date indicator when said driving member is in said first predetermined position around said guiding pin, said driving tooth leaving said toothing upon a rocking motion of said driving member against the action of said spring means and said driving tooth moving in a tangential direction with respect to said toothing when said driving member slides along the guiding pin, a safety tooth on said driving member being removed from the toothing of the date indicator when said driving member is in said first position around said guiding pin and said safety tooth engaging the toothing of the date indicator when said driving member is rocked into said second position, a control finger mounted for rotary motion and normally driven continuously in the same direction, a camming surface on said driving member extending in the path of said control finger and causing said driving member to rock around said guiding pin against the action of said spring means from said first to said second position when said camming surface is engaged by said control finger, and an indentation provided on said driving member and located in the path of said control finger, said control finger causing said driving member to slide along said guiding pin when this control finger engages said indentation.

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