United States Patent

Besson et al.

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[54] **TIMEPIECE WITH CIRCUMFERENTIALLY INDEXED SETTING POSITIONS**

[72] Inventors: **Rene Besson**, Neuchatel; **Claude Laesser**, Boudevilliers; **Daniel Rochat**, Neuchatel, all of Switzerland

[73] Assignee: **Ebauches S.A.**, Neuchatel, Switzerland

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[30] **Foreign Application Priority Data**

Feb. 8, 1971 Switzerland.....1859/71

[52] **U.S. Cl.** **58/85.5**, 58/58, 58/63

[51] **Int. Cl.**.....**G04b 27/00**

[58] **Field of Search**.....58/85.5, 63, 73, 58

[56] **References Cited**

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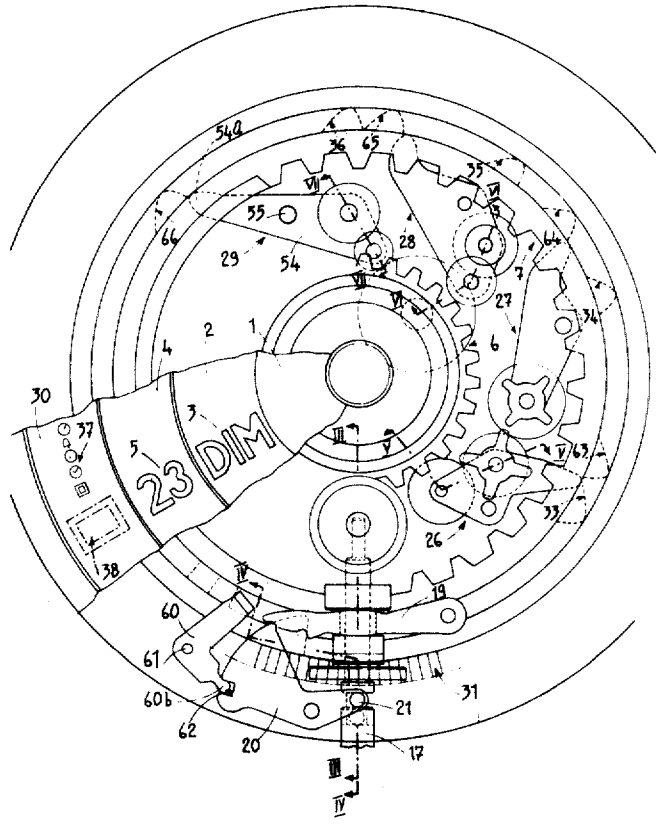
Primary Examiner—George H. Miller, Jr.

Attorney—Kenwood Ross et al.

[57] **ABSTRACT**

A timepiece comprising a control stem manually operable, capable of occupying at least two axial positions, characterized by the fact that it comprises a toothed rotatable member, operable by the stem in a first axial position thereof, and a set of control mechanism intended to execute different operations, comprising each a lever capable of occupying two positions, i.e. a rest position and a working position in which a wheel carried by the lever meshes with the toothing of the rotative member coaxial to the movement, a rotatable selecting member, controlled by the stem when it occupies a second axial position, whereby one or the other of the said control mechanism is brought selectively in its working position in which it operates when the stem, brought back in its first axial position, is operated.

9 Claims, 7 Drawing Figures



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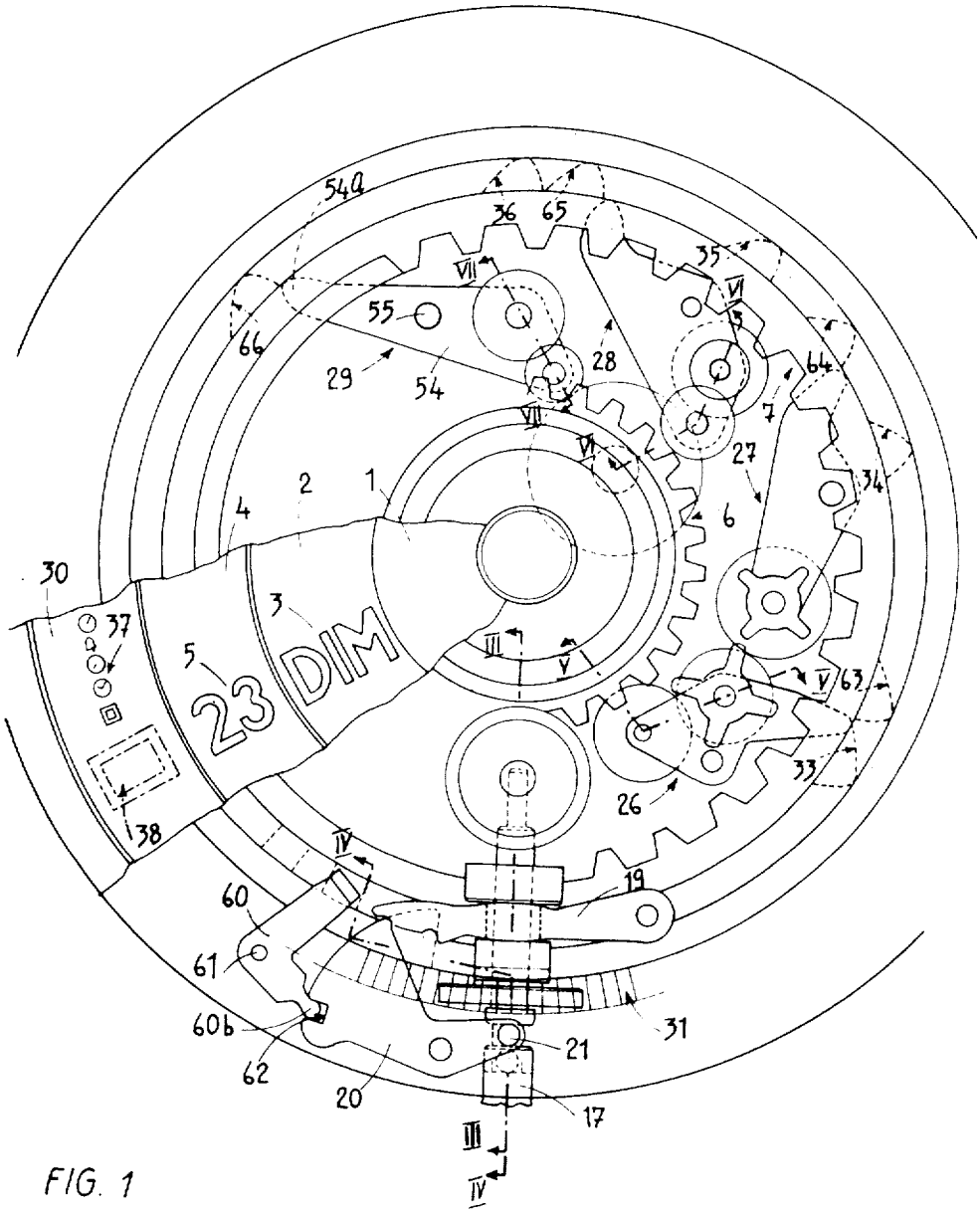

FIG. 1

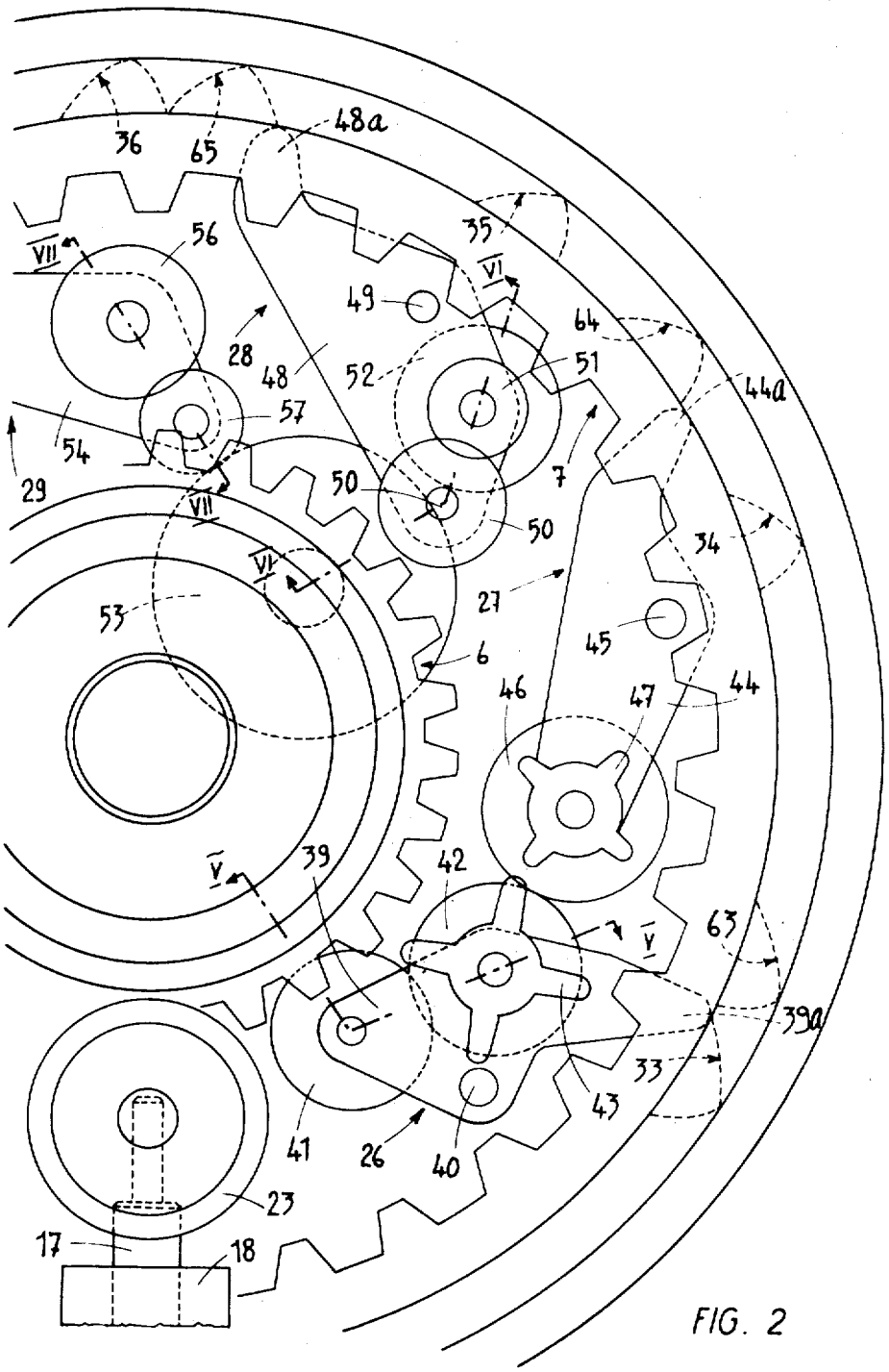
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FIG. 2

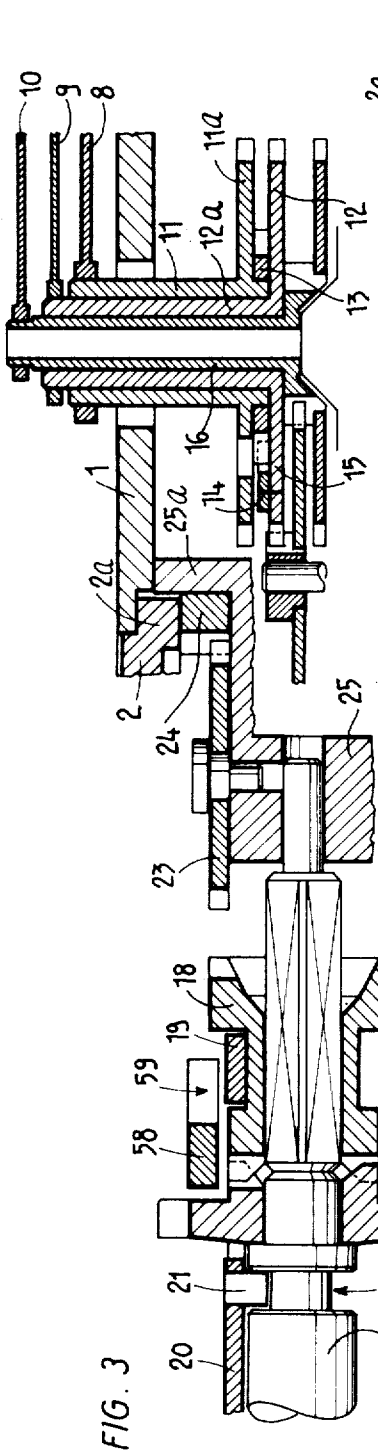

FIG. 3

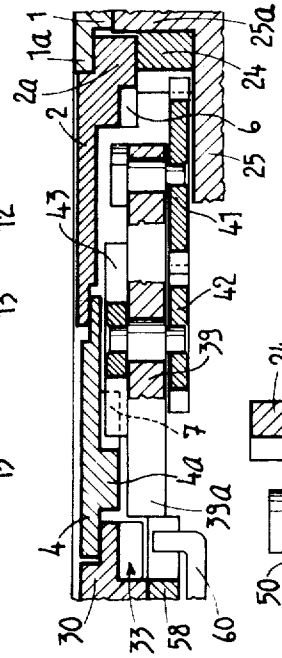

FIG. 5

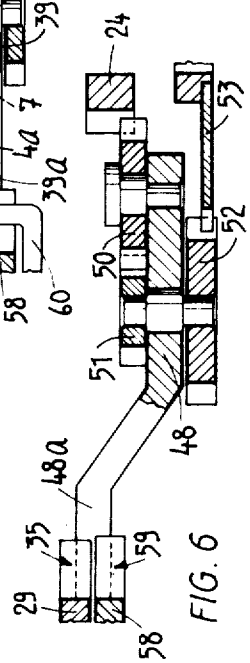

FIG. 6

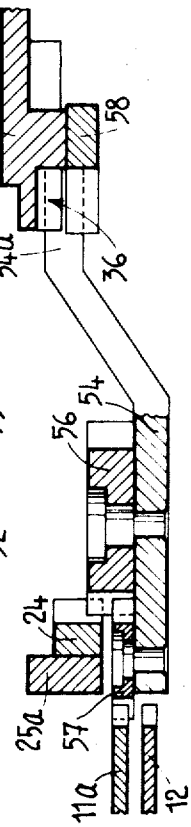

FIG. 7

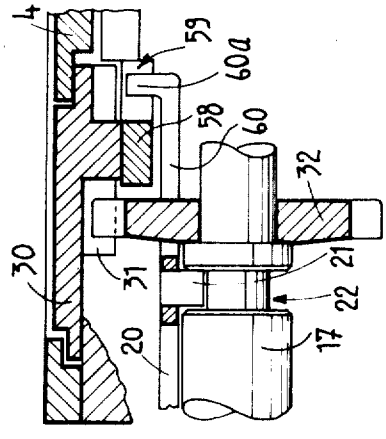

FIG. 4

TIMEPIECE WITH CIRCUMFERENTIALLY INDEXED SETTING POSITIONS

The present invention relates to a timepiece comprising a control stem manually operable, able to occupy at least two different axial positions.

This timepiece is characterized by the fact that it comprises a toothed rotative element, operable by means of the said stem in a first axial position thereof, and a set of control mechanisms intended to accomplish different operations, comprising each a lever able to occupy two positions, i.e. a rest position and a working position in which a wheel carried by the said lever is meshing with the toothing of the said rotative element which is coaxial to the movement, a rotatable selecting member, controlled by the said stem when it occupies a second axial position, permitting to bring selectively one or the other of the said control mechanisms in its working position in which it is able to accomplish the operation to which it is intended when the stem, brought back in its first axial position, is operated.

The drawing shows, by way of example, one embodiment of the object of the invention.

FIG. 1 is a plan view of an electric wristwatch comprising a supplementary hour hand, indicating the universal time, and comprising a calendar mechanism provided with a date-indicator and a day-indicator.

FIG. 2 is a view of a detail of FIG. 1, at an enlarged scale.

FIG. 3 is a sectional view along line III—III of FIG. 1, at an enlarged scale.

FIG. 4 is a sectional view along broken line IV—IV of FIG. 1, at an enlarged scale, and

FIGS. 5, 6 and 7 are sectional views along lines V—V, VI—VI and VII—VII, respectively, of FIGS. 1 or 2, in which, however, the elements as represented occupy a different position than in FIGS. 1 and 2.

The watch as represented comprises a calendar and a universal hour indicating means. To this effect, it comprises, mounted on a central bushing 1 of the frame of the movement, a crown 2 carry the indications 3 of the days of the week and, coaxially to this crown, a crown 4 carrying the indications 5 of the dates. The crown 2 of the days of the week is provided with a thicker central portion 2*a* in which is provided a toothing 6 serving at the same time to its driving, once each 24 hours, by the clockwork, and to its driving by a manual operable correcting mechanism which will be disclosed hereafter. Likely, the crown 4 of the dates is provided with a thicker portion 4*a* in which is provided a toothing 7 serving also to its driving by the clockwork and to its driving by the manually operable correcting mechanism.

The hand of the universal hour, designated by 8, situated under the ordinary hands of hours and minutes, designated respectively by 9 and 10, is carried by a supplementary pipe 11 freely mounted on the pipe 12*a* of the hour wheel 12 and which carries, fixedly mounted thereon, a ratchet wheel 13 with which cooperates a pawl 14 articulated by a pin 15 on the hour wheel 12 (FIG. 3). Thus, in one direction of rotation the hands 8 and 9 are angularly rigid with each other while, in the other direction, they are free with respect to each other; likely, the hand of the universal hour 8 can be driven, by a manually operable correcting mechanism which will be disclosed hereafter, in its normal

direction of rotation without the ordinary hour hand 9 be driven. The cannon-pinion, which carries the minute hand 10, is designated by 16.

The setting of the days of the week and of the dates, as well as the setting of the universal hour hand, as well as the setting of the other hands of the watch are carried out by means of only one control stem 17, radially arranged, which is able to occupy two axial positions. This stem 17 carries a sliding pinion 18 operated by a lever 19 which is itself placed under the action of a trigger-piece 20, a pin 21 of which is engaged in a groove 22 of the stem 17. The sliding pinion 18 is meshing, when the stem 17 is pulled, with an intermediate wheel 23, which is continuously meshing with a toothed crown 24 coaxial to the center of the movement, rotatably mounted on a flange 25*a* of the baseplate, designated by 25. This crown 24 is thus operable by means of the stem 17 and serves to control one or the other of a set of control mechanisms 26, 27, 28 and 29 which will be disclosed hereafter and which comprise each a lever articulated on the frame of the movement, able to occupy a working position and a rest position according to the position occupied by a selecting member.

This selecting member is constituted by a rotatable ring 30 surrounding the crown 4 of the dates and which is provided with an outer toothing 31 meshing, when the stem 17 occupies its pushed position, as represented in FIGS. 1 to 4 of the drawings, with a pinion 32 rotating with the said stem. It is to be noted that, when the stem 17 is pulled, in its working position, the pinion 32 is moved towards the left side of FIGS. 3 and 4, removing pinion 32 from the toothing 31. This selecting ring 30 is provided with a set of notches 33, 34, 35 and 36 which cooperate with the levers of the several control mechanisms 26 to 29 so as to permit to bring them in their working position. One could also provide the case where the selecting ring 30 would be provided with only one notch which would cooperate successively with the several control mechanisms.

The selecting ring 30 carries, on its upper face, indications 37 (FIG. 1) which appear through a window 38 of the dial and which permit the operator to know what is the selected function.

The control mechanisms will be disclosed hereafter more in detail. It is to be noted that the ones which have been represented sectionally (FIGS. 5, 6 and 7) have been represented on the sectional views in their working position, while they appear in their rest position in FIGS. 1 and 2.

The mechanism 26, which serves to set the date-indicator 4 (FIGS. 1, 2 and 5), comprises a lever 39 articulated in 40 on the frame of the movement and which carries a wheel 41 meshing, when the mechanism occupies its working position, with the toothing of the central control crown 24. This wheel 41 is meshing with a wheel 42 also carried by the lever 39, rigid with a four-fingers-wheel 43 cooperating, when the mechanism occupies its working position, with the inner toothing 7 of the crown 4 indicating the dates. The lever 39 is provided with a nose 39*a* engaging in the notch 33 of the selecting ring 30, under the action of a not represented spring, for bringing the mechanism in its working position (FIG. 5).

The mechanism **27**, which serves to set the days of the week indicator **2** (FIGS. 1 and 2), comprises a lever **44** articulated in **45** on the frame of the movement and a nose **44***a* of which, applied on the selecting ring **30** by a not represented spring, engages the notch **34** of the ring for bringing the mechanism in its working position. This lever **44** carries a wheel **46** intended to mesh with the central control crown **24** when the mechanism occupies its working position and which is rigid with a four-arms-wheel **47** cooperating with the toothing **6** of the indicator **2** of the days of the week.

The mechanism **28**, which serves to the setting of the watch (FIGS. 1, 2 and 6), comprises a lever **48** articulated in **49** on the frame of the movement and a nose **48***a* of which, applied against the selecting ring **30** by a not represented spring, engages the notch **35** of the ring for bringing the mechanism in its working position (FIG. 6). This lever **48** carries a wheel **50** intended to mesh with the toothing of a central control crown **24** when the mechanism occupies its working position, This wheel **50** is meshing with the wheel **51** rigid with the wheel **52** which cooperates, when the mechanism occupies its working position, with the wheel, designated by **53**, of the motionwork, in view of the setting of the watch.

The mechanism **29**, which serves to set the universal hour hand **8** (FIGS. 1, 2 and 7), comprises a lever **54** articulated in **55** on the frame of the movement and a nose **54***a* of which, applied against the selecting ring **30** by a not represented spring, engages the notch **36** of the ring for bringing the mechanism in its working position (FIG. 7). This lever **54** carries a wheel **56** which meshes, when the mechanism occupies its working position, with the toothing of the central control crown **24**. The wheel **56** is meshing with a pinion **57** also carried by the lever **54** which meshes, when the mechanism occupies its working position, with a wheel **11***a* rigid with the pipe **11** carrying the hand **8** of the universal hour.

So as to prevent that the operator forgets to bring back the selecting ring **30** into an angular position in which all the control mechanisms are in their rest position, that is necessary for a correct operation of the watch, the watch comprises a safety device constituted by a ring **58** coaxial to the center of the movement, situated under the selecting ring **30**, and which is provided with a notch **59** (FIG. 4) in which engages a bent portion **60***a* of a lever **60** articulated in **61** on the frame of the movement and which is provided with a circular portion **60***b* engaged into a notch **62** of the trigger-piece **20**. Thus the axial movements of the stem **17** produce the angular displacements of the safety ring **58**. This ring **58** is provided with several notches **63**, **64**, **65** and **66** which come simultaneously opposite noses **39***a*, **44***a*, **48***a* and **54***a* of the levers of the several control mechanisms when the stem is pulled. There results, reciprocally, in the fact that when the stem **17** is pushed, in the position represented in the drawing, all the control mechanisms are brought back in their rest position by the safety ring **58**.

It is to be noted that the notches **33** to **36** of the selecting ring **30** as well as the noses of the levers of each mechanism **26** through **29**, could be arranged so as these noses be imprisoned in the notches when they enter therein, so as to prevent any untime movement of the levers when they are in their working position.

In the case of a spring mechanical watch, one could provide a control mechanism of the type of the mechanisms **26** to **29** which would serve to the winding of the spring.

The watch could also be a chronograph, the control stem being arranged so as to be able to be moved axially towards the center of the movement beyond its pushed position, against the action of a return spring. It would operate, from its pushed position, as the push-button of a chronograph the three operations of which, running, stopping and resetting to zero of the chronograph hand, are controlled by only one push-button.

What we claim is:

1. Timepiece comprising a control stem manually operable, able to occupy at least two axial positions, a movement, a toothed rotatable member coaxial to the movement operable by the said stem in a first axial position thereof, and a set of control mechanisms intended to execute different operations, each comprising a lever able to occupy two positions, i.e. a rest position and a working position in which a wheel carried by the said lever is meshed with the toothing of the said rotatable member, a rotatable selecting member controlled by the said stem when it occupies a second axial position in which it brings selectively one of the said control mechanisms to its working position in which it operates when the stem, brought back in its first axial position, is operated.

2. Timepiece as claimed in claim **1**, characterized by the fact that the rotatable selecting member is constituted by a ring coaxial to the movement, provided with a toothing meshing with a pinion carried by the control stem, this ring being provided with at least one recess which, when it is opposite a control mechanism, authorizes the movement of the lever of this mechanism to its working position.

3. Timepiece as claimed in claim **1**, characterized by the fact that the said toothed rotatable member meshes with an intermediate wheel with which cooperates the toothing of a sliding pinion carried by the said stem.

4. Timepiece as claimed in claim **1**, characterized by the fact that one of the control mechanisms comprises a star-wheel rigid with a wheel meshing with the wheel controlled by the toothed rotatable member, this star-wheel cooperating with the inner toothing of a date indicating crown.

5. Timepiece as claimed in claim **1**, characterized by the fact that one of the control mechanisms comprises a pinion rigid with the wheel controlled by the toothed rotatable member and which is meshing with a wheel rigid with a pinion which meshes with the wheel of the motion-work, that permits the setting of the timepiece.

6. Timepiece as claimed in claim **1**, characterized by the fact that one of the control mechanisms comprises a wheel meshing with the wheel controlled by the toothed rotatable member, this wheel meshing with a supplementary hour wheel carrying a universal hour hand, in view of the setting of the position of this supplementary universal hour hand.

7. Timepiece as claimed in claim **1**, characterized by the fact that the said selecting member carries, on its upper face, indications relating to the several operations which are controlled by the said control stem, these indications appearing successively in a window of the dial, so as to permit the operator to know what is the selected operation.

8. Timepiece as claimed in claim 1, characterized by the fact that it comprises a rotatable locking member, coaxial to the selecting member, controlled by the axial movements of the control stem, and which is able to occupy two positions, one in which it maintains the said control mechanisms in their rest position, and the other in which it authorizes these control mechanisms to be operated by the rotatable selecting member.

9. Timepiece as claimed in claim 8, characterized by the fact that the locking member is constituted by a ring coaxial to the selecting member, provided with a set of recesses able to be brought simultaneously opposite the several levers of the control mechanisms, when the said ring occupies its second position, the movements of the said ring from one position to the other one being produced by a two-arms-lever articulated on the movement, one arm of which is substantially radial and cooperates with the said ring for rotating it to the angular value which is necessary so that it passes from one of its working positions to the other, and the other arm of which is connected to a trigger-piece operated by the control stem, the whole in such a way that to each of the two axial positions of the stem corresponds an angular position of the said locking ring.

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