Dec. 14, 1971 C. VUILLEUMIER 3,626,689

TIMEPIECE WITH ISOLATED HOUR HAND CHANGING DEVICE

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FIG.1

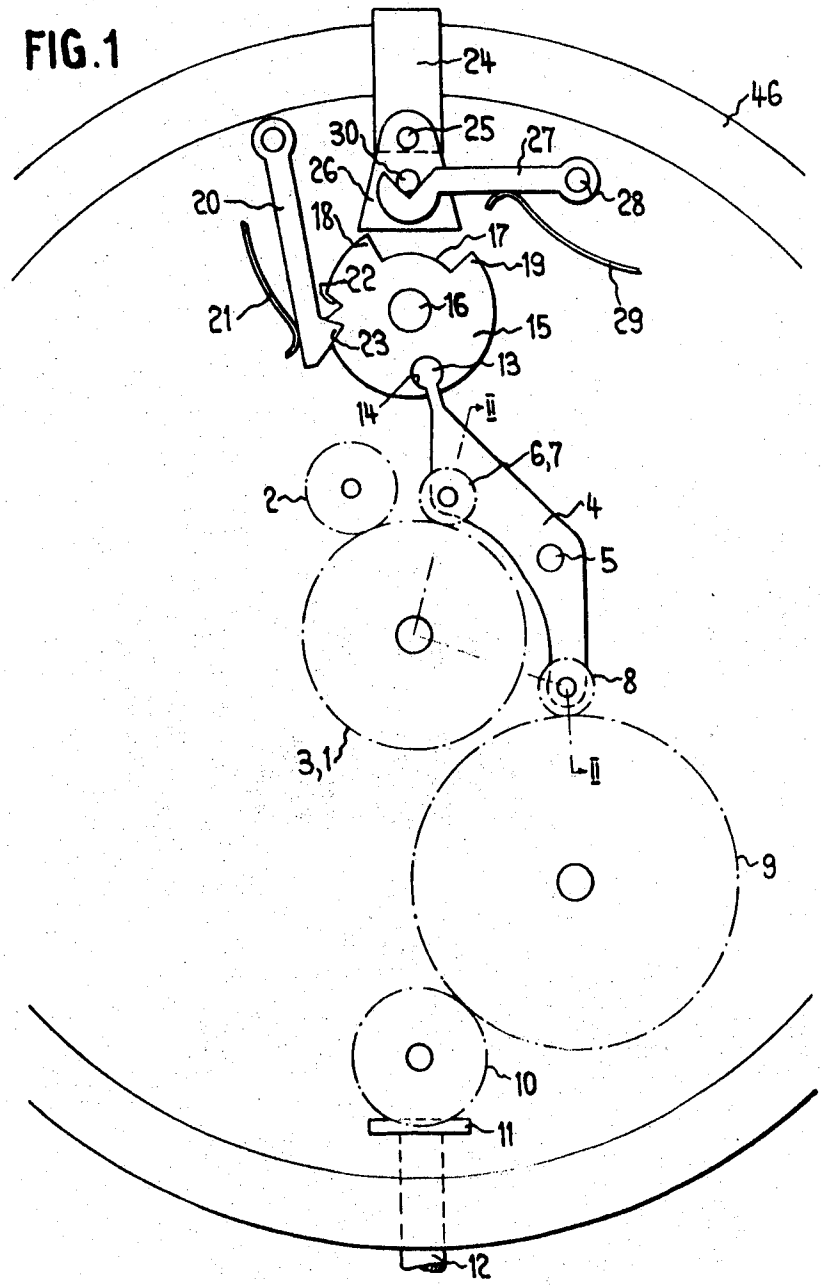
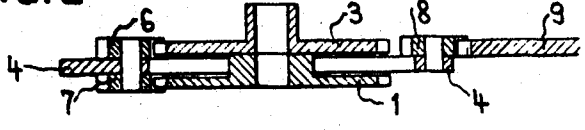


FIG.2



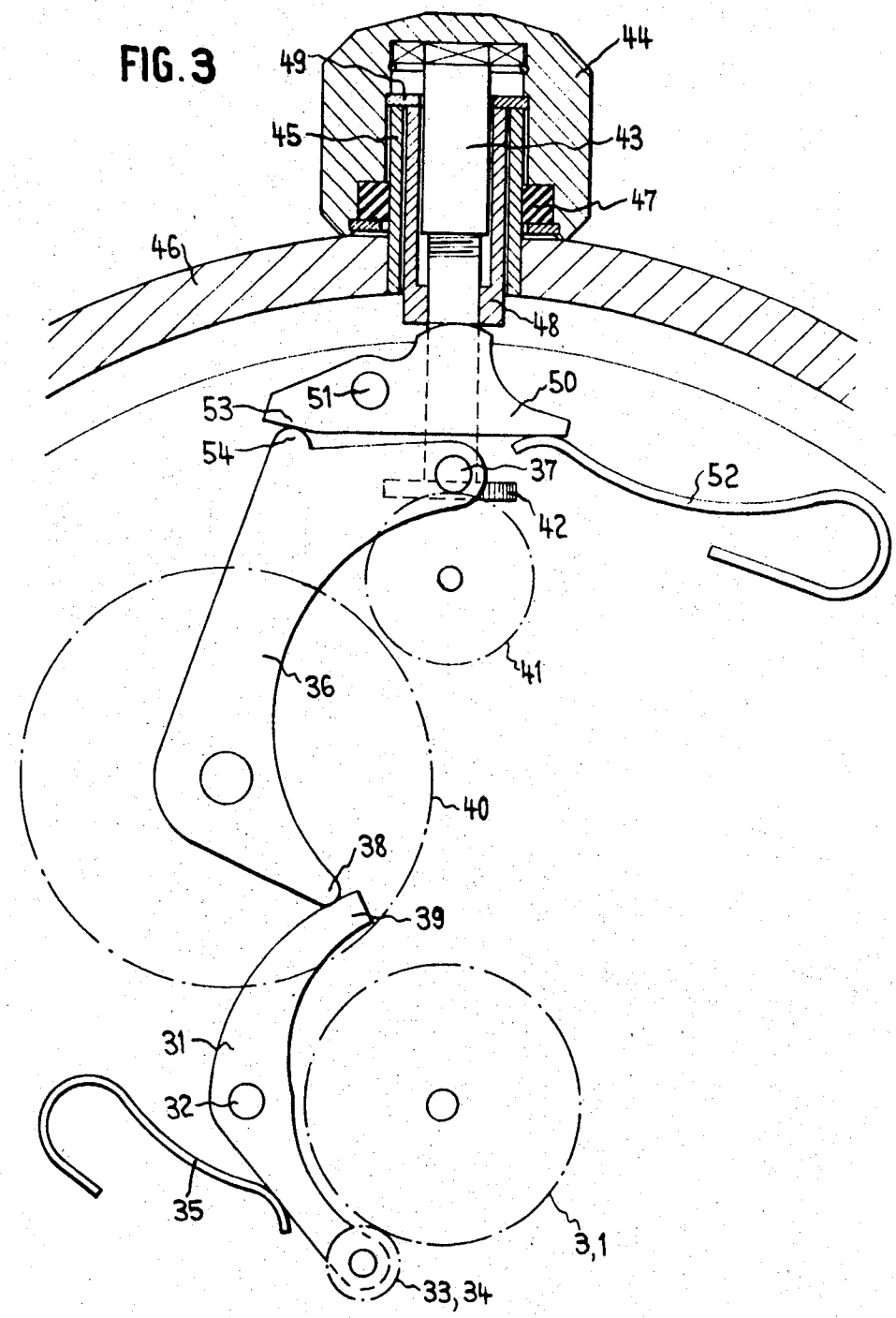
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TIMEPIECE WITH ISOLATED HOUR HAND CHANGING DEVICE

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FIG. 3



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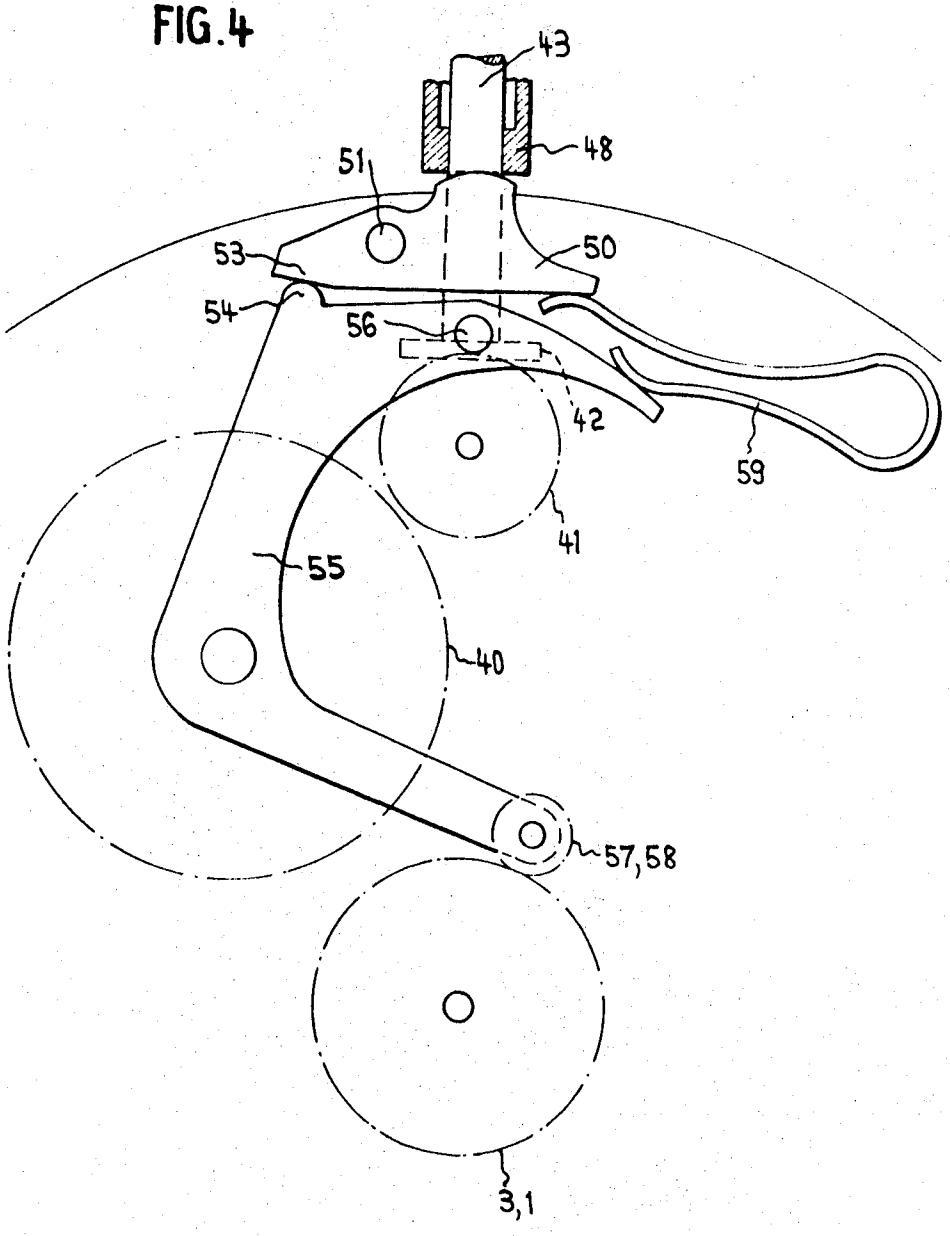
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TIMEPIECE WITH ISOLATED HOUR HAND CHANGING DEVICE

Filed Jan. 25, 1971 3 Sheets-Sheet 3

FIG. 4



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TIMEPIECE WITH ISOLATED HOUR HAND CHANGING DEVICE

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U.S. Cl. 58—85.5 5 Claims

ABSTRACT OF THE DISCLOSURE

A timepiece comprising an additional gear controlling the hour hand, which gear is rotatably mounted coaxially with a second gear, actuated by the movement of the timepiece, and means actuatable from the outside for rotating the additional gear by one or more steps without influencing the indication of the other hand or hands, characterized in that it comprises in addition a yoke which may take, under the action of an outer control member, on the one hand, a first position wherein the said gears are interlocked in the direction of rotation upon normal setting of the timepiece and during the running thereof, and, on the other hand, a second position wherein the said gears are disengaged from each other to permit actuating only the additional gear controlling the hour hand.

The present invention relates to a timepiece, comprising an additional gear controlling the hour hand, which gear is rotatably mounted coaxially with a second gear, actuated by the movement of the timepiece, and means actuatable from the outside for rotating the additional gear by one or more steps, thus correspondingly rotating the hour hand, without influencing the indication of the other hand or hands. This timepiece is broadly characterized in that it comprises in addition a yoke which may take, under the action of an outer control member, on the one hand, a first position wherein the said gears are interlocked in the direction of rotation upon normal setting of the timepiece and during the running thereof, and, on the other hand, a second position wherein the said gears are disengaged from each other to permit actuating only the additional gear controlling the hour hand.

The accompanying drawings illustrate, by way of example, three embodiments of the invention. There is shown in the drawings only what is necessary for an understanding of the invention.

FIG. 1 is a schematic plan view of the first embodiment.

FIG. 2 is a cross-sectional view taken along the line II—II in FIG. 1.

FIG. 3 is a plan view, partially in section, of the second embodiment.

FIG. 4 is a plan view, partially in section, of the third embodiment.

The timepiece according to the first embodiment (FIGS. 1 and 2) includes a conventional hour wheel **1**, which is in mesh with the minute wheel pinion **2**. The latter is rigidly connected with the minute wheel (not shown) which engages the cannon pinion (also not shown). The hour wheel **1** is rotatably mounted on the cannon pinion. On the same cannon pinion is freely fitted an additional wheel **3**, which is identical with the hour wheel **1** and carries the hour hand (not shown). Both wheels **1** and **3** are, therefore, coaxial. The minute hand, not shown, is carried as usual by the cannon pinion. A second hand, coaxial or not with the other hands, may be provided for.

Means, described later on, are provided for actuating from the outside the additional wheel **3** in order to rotate the same by one or more steps, so as to correspondingly rotate the hour hand without influencing the indication of the other hand or hands. This is useful particularly when the user passes from a time zone to another one, for instance on airplane travels.

A yoke **4**, pivoting as at **5** on the frame of the watch, is arranged in the vicinity of the wheels **1** and **3**. It carries two identical pinions **6** and **7**, coaxial with each other and rigidly connected with each other. Both pinions **6** and **7** are rotatably mounted on the yoke **4**. On the other hand, the yoke **4** carries, at its other end, a pinion **8** which is in mesh with a toothed wheel **9** engaging an intermediate wheel **10**. The latter is in mesh with a pinion **11** susceptible of being actuated by a control stem **12**.

At its end near the pinions **6** and **7**, the yoke **4** presents a lug **13** having the shape of a circular head, which engages a recess **14** of a corresponding shape, provided in a cam disc **15** pivoting as at **16** in the frame of the watch. The cam disc **15** has a notch **17** the walls of which define noses **18** and **19**. A jumper **20**, subjected to the action of a spring **21**, may engage either one of two catches **22** and **23** of the cam disc **15**. A control push-piece **24**, actuatable from the outside of the watch-case **46**, is linked as at **25** to an actuating member **26**, adapted to act upon the cam disc **15**. A lever **27**, pivoting on the frame as at **28**, is subjected to the action of a spring **29** which tends to turn clockwise (FIG. 1) the lever **27** and to push back the push-piece **24** towards the outside, through the intermediary of a pin **30** secured in the actuating member **26**.

In the position of the parts illustrated in FIGS. 1 and 2, the yoke **4** has its rest position, i.e. the normal position during the running of the watch. The pinion **6** is in mesh with the additional wheel **3**, and the pinion **7** is in mesh with the hour wheel **1**, so that the wheels **1** and **3** are interlocked in the direction of rotation. As concerns the pinion **8**, it is in mesh with the toothed wheel **9**, but is disengaged from the additional wheel **3**. When the watch is working, the hour wheel **1** is driven by the watch movement and its rotation is transmitted to the additional wheel **3** through the pinions **7** and **6**, so that the hour hand is normally rotated. The normal setting of the watch, i.e. the simultaneous correction of the hour and minute hands, can be carried out as usual, through the minute wheel pinion **2**, by means of a conventional device (not shown). If the control stem **12** is turned, the pinion **11** actuates the intermediate wheel **10** and the toothed wheel **9**, without exerting any function.

In order to bring the yoke **4** into its second position, or active position, the push-piece **24** is depressed, so that the actuating member **26** is acted upon. The member **26** bears on the nose **18** of the cam disc **15** and rotates the latter by a certain angle in the counterclockwise direction of FIG. 1, so that the jumper **20** enters the catch **22** of the cam disc **15**. The rotation of the cam disc **15** rotates the head **13** of the yoke **4**, so that the latter is rocked in the clockwise direction of FIG. 1. When the pressure exerted on the push-piece **24** is released, the piece **24** returns into its primitive position by the spring **29**, the lever **27**, the pin **30** and the actuating member **26**. When the yoke **4** occupies this second position, the pinions **6** and **7** are disengaged from the wheels **3** and **1**, respectivley, whereas the pinion **8**, still in mesh with the toothed wheel **9**, is also in mesh with the additional wheel **3**. Now, if the control stem **12** is turned, in the one direction or the other, the pinion **11** rotates the intermediate wheel **10** and the toothed wheel **9**, and the latter in turn actuates the additional wheel **3** and, therefore, the hour hand. However, the rotation of the wheel **3** is not transmitted to the hour wheel **1**, since the pinions **6** and **7** are now at a distance of the wheels **3** and **1**, respectively. It is therefore possible to advance or move back the hour hand by one or more steps, without influencing the indication given by the other hand or hands. When this correction is effected, the push-piece **24** is again actuated,

and this piece 24 now acts, through the actuating member 26, upon the nose 19 of the cam disc 15, so that the cam disc 15 brings back the yoke 4 into its first position, or rest position. For ensuring that the hour hand always take an exact position upon the correction, it is possible to magnetically position the additional wheel 3 with respect to the hour wheel. A small error in the correction of the hour hand is, therefore, immaterial.

The second embodiment (FIG. 3) includes, like the first embodiment, a conventional hour wheel 1 and an additional wheel 3, these both wheels being rotatably mounted, coaxially with each other, the wheel 3 carrying the hour hand.

A yoke 31, pivoting as at 32 on the frame of the watch, is arranged in the vicinity of the wheels 1 and 3. It carries two identical pinions 33 and 34, coaxial with each other and rigidly connected with each other. Both pinions 33 and 34 are rotatably mounted on the yoke 31. The yoke 31 is subjected to the action of a spring 35 which tends to rotate it in the counterclockwise direction of FIG. 3 and to keep the pinions 33, 34 in mesh with the wheels 3 and 1, respectively.

A second yoke, 36, pivoting as at 37 on the frame of the watch, presents a nose 38 which is maintained in contact with the tail 39 of the first yoke 31. On the yoke 36 is rotatably mounted a toothed wheel 40, which is susceptible of engaging the additional wheel 3, as explained later on. An intermediate wheel 41, having a stationary axis, is arranged in the vicinity of the wheel 40 and is in mesh with a pinion 42 susceptible of being actuated by a control stem 43. The latter is rigidly connected in the direction of rotation with a crown 44 which may be moved axially by sliding along a tube 45 rigidly secured to the watch-case 46. A gasket 47 ensures the tightness of the crown 44. A sleeve 48 is freely mounted between the stem 43 and the tube 45 and is axially retained towards the top by a ring 49 bearing on a shoulder of the crown 44. At the bottom, the sleeve bears against a lever 50 pivoting as at 51 on the frame of the watch. The lever 50 is subjected to the action of a spring 52, which presses the nose 53 of the lever 50 against a boss 54 of the second yoke 36.

In the position of the parts illustrated in FIG. 3, the first yoke 31 occupies its rest position, i.e. the normal position during the working of the watch. The pinion 33 is in mesh with the additional wheel 3, and the pinion 34 is in mesh with the hour wheel 1, so that the wheels 1 and 3 are interlocked in the direction of rotation. The second yoke 36 occupies such a position that the toothed wheel 40 is disengaged from the additional wheel 3. When the watch is running, the hour wheel 1 is driven by the watch movement and its rotation is transmitted to the additional wheel 3 through the pinions 34 and 33, so that the hour hand is normally rotated. Normal setting, i.e. the simultaneous correction of the hour and minute hands, may be carried out in the usual manner, by means of a conventional device (not shown). If the crown 44 and the control stem 43 are turned, the pinion 42 drives the intermediate wheel 41, without exerting any function; besides, the intermediate wheel 41 is not in mesh with the toothed wheel 40.

For bringing the first yoke 31 into its second position, or active position, the crown 44 has to be pulled towards the outside, The spring 52 rocks the lever 50 in the counterclockwise direction of FIG. 3, so that this lever 50 repels the sleeve 48, which may move towards the top until it touches the ring 49. The rotation of the lever 50 causes its nose 53 to act upon the boss 54 of the second yoke 36 and rocks the latter in the counterclockwise direction of FIG. 3, about its spindle 37. This movement of the yoke 36 brings the toothed wheel 40 in mesh simultaneously with the intermediate wheel 41 and the additional wheel 3. On the other hand, the nose 38 of the yoke 36 acts upon the tail 39 of the yoke 31 and rocks the latter, against the action of the restoring spring 35. Therefore, the pinions 33 and 34 are disengaged from the wheels 3 and 1, respectively. Now, if the crown 44 and the control stem 43 are turned in one direction or the other, the pinion 42 drives the intermediate wheel 41 and the toothed wheel 40, and the latter in turn actuates the additional wheel 3 and, therefore, the hour hand. However, the rotation of the wheel 3 is not transmitted to the hour wheel 1, since the pinions 33 and 34 are now at a distance of the wheels 3 and 1, respectively. It is, therefore, possible to advance or move back the hour hand by one or more steps, without influencing the indication given by the other hand or hands. When this correction has been effected, the crown 44 is brought back into its primitive position. The ring 49 repels the sleeve 48 towards the bottom, and the latter brings back the lever 50 into its initial position, against the action of the restoring spring 52. The yoke 36 is now idle, so that the spring 35 can swing the yoke 31 in the counterclockwise direction of FIG. 3, and the tail 39 of the yoke 31 brings back the yoke 36 into its rest position. As in the case of the first embodiment, it is possible, if desired, to magnetically position the additional wheel 3 with respect to the hour wheel 1, in order to ensure an exact position of the hour hand and render immaterial a small error in the correction of the hour hand.

The third embodiment (FIG. 4) is similar to the preceding one, except that the yokes 31 and 36 are replaced by a single yoke 55, pivoting as at 56 on the frame of the watch. At its free end, the yoke 55 carries, freely mounted thereon, two identical pinions 57 and 58, coaxial with each other and rigidly connected with each other. The yoke 55 is subjected to the action of a restoring spring 59 which tends to rotate the same in the clockwise direction of FIG. 4 and to keep the pinions 57 and 58 in mesh with the wheels 3 and 1, respectively.

One the yoke 55 is rotatably mounted a toothed wheel 40, which is susceptible of engaging the additional wheel 3. An intermediate wheel 41, having a stationary axis, is arranged in the vicinity of the wheel 40 and is in mesh with a pinion 42 susceptible of being actuated by a control stem 43. The latter is rigidly connected with a crown identical with the crown 44 described in connection with FIG. 3. A sleeve 48 is again provided, which is identical with the sleeve shown in FIG. 3. At the bottom, the sleeve 48 bears on a lever 50 pivoting as at 51 on the frame of the watch. The spring 59 already mentioned simultaneously acts upon the lever 50 and causes the nose 53 of the lever 50 to bear on a boss 54 of the yoke 55.

In the position of the parts illustrated in FIG. 4, the yoke 55 occupies its rest position. The pinion 57 is in mesh with the additional wheel 3, and the pinion 58 is in mesh with the hour wheel 1, so that the wheels 1 and 3 are interlocked in the direction of rotation. The yoke 55 occupies such a position that the toothed wheel 40 is disengaged from the additional wheel 3. When the watch is working, the hour wheel 1 is driven by the movement of the watch and its rotation is transmitted to the additional wheel 3 by the pinions 58 and 57, so that the hour hand is normally rotated. The normal setting, i.e. the simultaneous correction of the hour and minute hands, may be carried out in the usual manner, by means of a conventional device (not shown). If the control stem 43 is turned, the pinion 42 drives the intermediate wheel 41, without exerting any function; besides, the intermediate wheel 41 is not in mesh with the toothed wheel 40.

For bringing the yoke 55 into its second position, or active position, the crown is pulled towards the outside. The spring 59 swings the lever 50 in the counterclockwise direction of FIG. 4, so that this lever 50 repels the sleeve 48 towards the top. The rotation of the lever 50 causes its nose 53 to act upon the boss 54 of the yoke 55 and rocks the latter in the counterclockwise direction of FIG. 4, about its spindle 56. This movement of the yoke 55 brings the toothed wheel 40 in mesh simultaneously with the intermediate wheel 41 and the additional wheel 3.

On the other hand, the same movement of the yoke **55** disengages the pinions **57** and **58** from the wheels **3** and **1**, respectively. Now, if the control stem **43** is turned in the one direction or the other, the pinion **42** rotates the intermediate wheel **41** and the toothed wheel **40**, and the latter in turn actuates the additional wheel **3** and, therefore, the hour hand. However, the rotation of the wheel **3** is not transmitted to the hour wheel **1**, since the pinions **57** and **58** are now at a distance from the wheels **3** and **1**, respectively. It is, therefore, possible to advance or move back the hour hand by one or more steps, without influencing the indication given by the other hand or hands. When this correction has been effected, the crown is pushed back into its primitive position. The sleeve **48** brings back the lever **50** into its initial position, against the action of the restoring spring **59**. The yoke **55** is brought back into its primitive position by the same spring **59**.

I claim:

1. A timepiece, comprising an hour hand, a conventional hour gear actuated by a conventional movement of the timepiece, an additional gear carrying the hour hand, which gear is rotatably mounted coaxially with the conventional hour gear, and means actuatable from the outside for rotating the additional gear by one or more steps, thus correspondingly rotating the hour hand, without influencing the indication of the other hand or hands, characterized in that it comprises in addition a yoke which may take, under the action of an outer control member, on the one hand, a first position wherein the said gears are interlocked in the direction of rotation upon normal setting of the timepiece and during the running thereof, and, on the other hand, a second position wherein the said gears are disengaged from each other to permit actuating only the additional gear carrying the hour hand.

2. A timepiece according to claim **1**, wherein the said yoke carries, rotatably mounted thereon, two identical pinions, coaxial and rigidly connected with each other, the said pinions being in mesh with each of the said gears, respectively, when the said yoke occupies the said first position, whereas they are disengaged from the said gears when the said yoke occupies the said second position.

3. A timepiece according to claim **1**, comprising a cam disc susceptible of being actuated by a push-piece and of being thus brought into either one of two definite end positions, the said cam disc controlling the said yoke.

4. A timepiece according to claim **1**, comprising a second yoke controlling the first yoke and a control crown whose axial position determines the position of the said second yoke.

5. A timepiece according to claim **1**, comprising a control crown whose axial position determines the position of the said yoke.

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U.S. Cl. X.R.

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