Feb. 15, 1949. J. P. GRAEF 2,461,599

HOUR-INCREMENT HOUR HAND SETTING MECHANISM

Filed Sept. 2, 1944 2 Sheets-Sheet 1

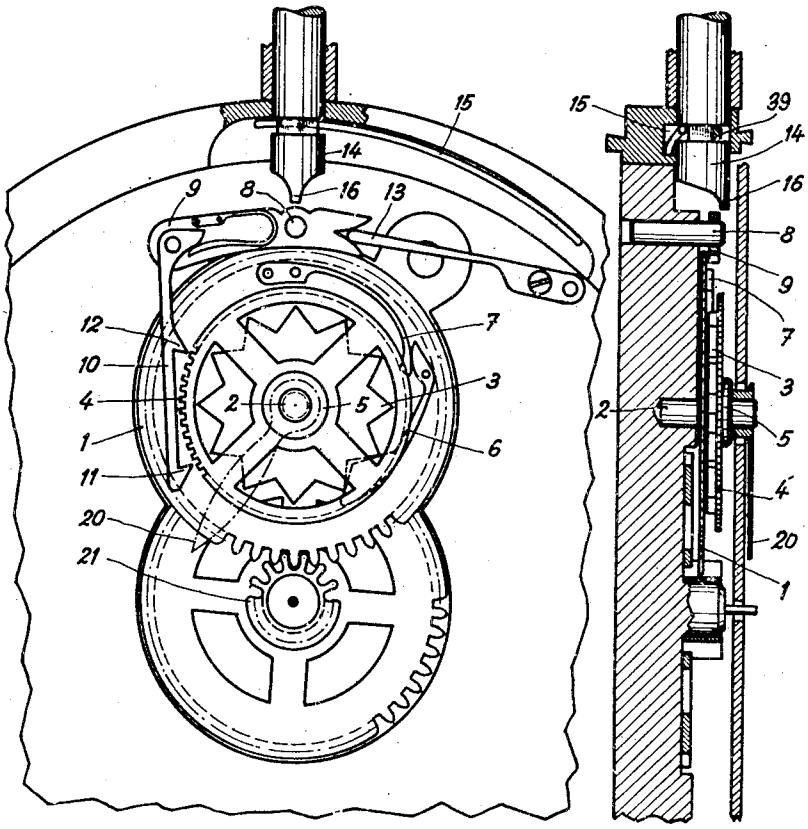

Fig. 1.

Fig. 2.

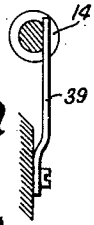

Fig. 2a

Inventor,
Jean-Pierre Graef
By
Young, Emery & Thompson
Attys.

Feb. 15, 1949. J. P. GRAEF 2,461,599

HOUR-INCREMENT HOUR HAND SETTING MECHANISM

Filed Sept. 2, 1944 2 Sheets-Sheet 2

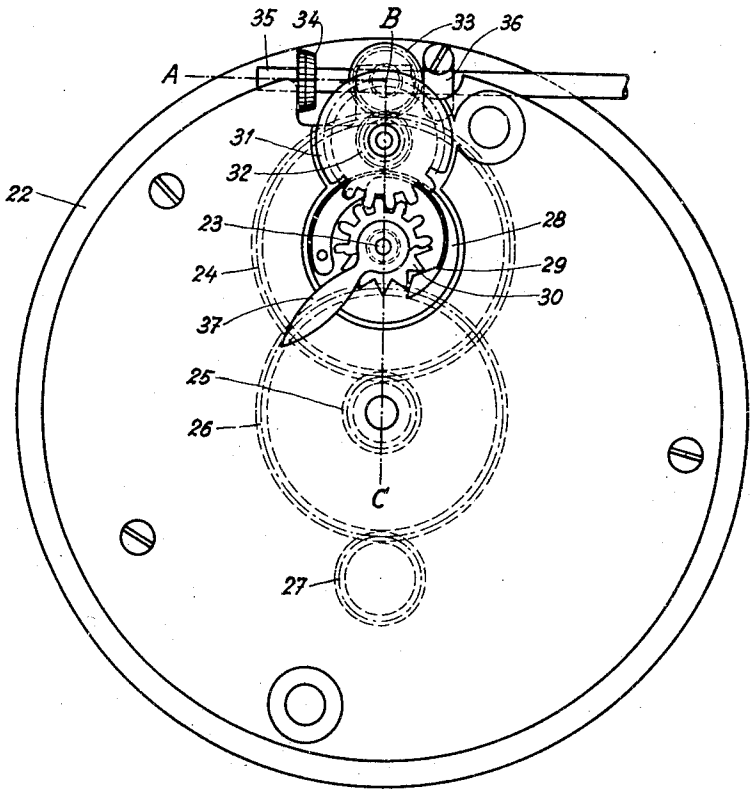

Fig. 3.

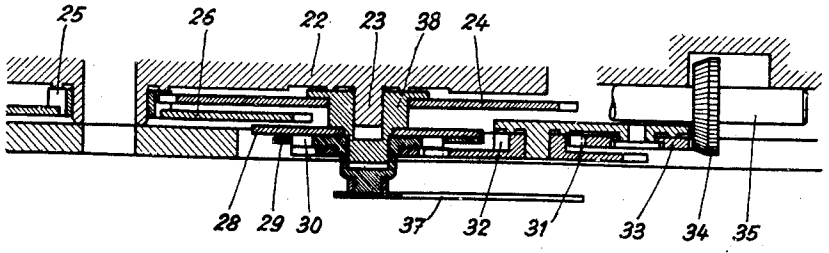

Fig. 4.

Jean-Pierre Graef Inventor,
By Young, Emery & Thompson
Attys.

Patented Feb. 15, 1949

2,461,599

UNITED STATES PATENT OFFICE

2,461,599

HOUR-INCREMENT HOUR HAND SETTING MECHANISM

Jean Pierre Graef, La Chaux-de-Fonds, Switzerland

Application September 2, 1944, Serial No. 552,489
In Switzerland July 22, 1943

Section 1, Public Law 690, August 8, 1946
Patent expires July 22, 1963

5 Claims. (Cl. 58—80)

1

This invention relates to watches. Object of the invention is a watch in which the hour-hand is coupled with a wheel taking along the hour-hand by means of a mechanism allowing a sudden change of the position of this hand with regard to the said wheel by a predetermined angle. Such an arrangement can be used in pocket chronometers, as well as in board watches or in wrist watches and is particularly useful when the user goes from one time zone to another. These time zones vary by an entire hour one from the other. However, as this difference may be in the one or the other sense, means are preferably provided allowing the hour-hand to be advanced or returned by an entire hour.

The accompanying drawings illustrate, by way of example, two embodiments of the watch according to the invention. They relate to watches with an hour-hand independent of the minute-hand, that is, with an hour-hand rotating over a separate circle of hour-indicia which is not concentric with the dial of the watch.

Figure 1 is a plan view showing the first embodiment, in so far as is necessary for the comprehension of the invention;

Figure 2 is a section through this first example;

Figure 2a shows a detail of the first example;

Figure 3 shows a plan view of the second embodiment, in so far as is necessary for the comprehension of the invention with a bevel pinion in disengaged position;

Figure 4 is a section along the broken line A B C of Fig. 3, but with the bevel pinion in engaged position.

In Figs. 1 and 2 the hour-wheel 1 driven by the pinion 21 is loosely mounted on an axle 2 to which a star-shaped wheel 3 and a wheel 4 with square-shaped teeth are rigidly fixed. The hour-hand 20 shown in chain-dotted lines is fixed to the hub 5 of the star-shaped wheel 3. On the hour-wheel 1 a pawl 6 is pivoted, the free end of which is pressed by a spring 7 into one of the twelve tooth-gaps of the star-shaped wheel 3 which correspond to the different hour-indicia.

In the neighbourhood of the wheel 1 an oscillatory member 9 is pivoted on the pivot 8, a double-acting pawl 10 being articulated to said member 9. This pawl, in its median position shown in the drawing, bears with the portion between the hooks 11 and 12 slightly and elastically against the square-shaped teeth of the wheel 4. The pawl 10 is held in this median position by a spring 13 engaging a notch of the oscillatory member 9.

A pusher 14 illustrated in Fig. 2 goes through the caseband of the watch. It is rotatably ar-

2

ranged and under the influence of two springs. The first one, 15, holds the pusher 14 out of contact with the oscillatory member 9 and the second one, 39, holds the nose 16 of the pusher 14 constantly in such a position that an accidental operation has no influence whatever upon the oscillatory member 9. For acting upon the latter in the one or the other direction, it is, therefore, necessary, to rotate the pusher by 90° in order to bring the nose 16 either to the right or the left side of the pivot 8 of the oscillatory member 9. This rotation having been carried out, the pressure which follows thereupon acts on the one or the other side of this pivot 8 in order to engage either the hook 11 or the hook 12 with the toothed wheel 4 and to advance or to return this latter by one tooth. This movement corresponds to the desired displacement of the hour-hand. When the pusher is again released it is brought back by the springs acting upon it. The pawl 10 again takes the position shown and the watch can continue to work.

Referring now to the second example shown in Figs. 3 and 4 the plate 22 of the movement carries a pin 23 on which the hour-wheel 24 rotates coupled to the spring motor by means of non-represented gearings. This wheel 24 meshes with the minute-pinion 25; the minute-work wheel 26 meshes with the pinion 27 on the axle of which a minute-hand is mounted. The hub 38 of the wheel 24 is connected with a plate 28 to which a spring 29 is fixed whose free end bears on the circumference of a star-shaped wheel 30 loosely mounted on an extension of the hub 38. This star-shaped wheel 30 has, on the one hand, a toothing with twelve notches each corresponding to an hour of a day. On the other hand this star-shaped wheel 30 has an ordinary toothing engaging an intermediate wheel 31, the pinion 32 of which meshes a second intermediate wheel 33 engaging a bevel pinion 34 fixed to the rod 35. This latter can carry out an axial movement. At one end of its stroke (see Fig. 3) it is completely released, while, at the other end of its stroke it is coupled with the intermediate wheel 33. A spring 36 cooperating with the rod 35 holds the latter in place in the one or the other of its positions.

The hour-hand 37 is fixed to the hub of the star-shaped wheel 30.

It may be seen that, the bevel pinion 34 being in the position represented in Fig. 3, the hour-hand 37 is normally taken along by the star-shaped wheel coupled with the hub 38 of the wheel 24 by means of the spring 29. If, however,

the pinion 34 engages the intermediate wheel 33 the hour-hand, by operation of the rod 35, can be rotated in the one or the other direction, while moving the star-shaped wheel along the free end of the spring 29.

What I claim is:

1. In a watch, a star-shaped wheel, an hour hand in connection with said star-shaped wheel, an hour wheel, a means in relation with said star-shaped wheel, adjusted to drive the latter in either rotating direction relative to said hour wheel in order to rotate said hour hand independenly of any movement of said hour wheel, and a pawl in driven connection with said hour wheel and in engagement with said star-shaped wheel to drive said latter on normal advance movement of said hour hand provoked by said hour wheel and to trail over said star-shaped wheel when the latter is driven by said means.

2. In a watch, a pusher projecting to the outside, a star-shaped wheel, an hour-hand in connection with said star-shaped wheel, a toothed wheel coupled with said star-shaped wheel, an hour wheel, an oscillatory member in operating relation with said pusher, a first pawl in operating relation with said oscillatory member and said toothed wheel to engage said toothed wheel on operation of said pusher to produce movement of said star-shaped wheel in order to rotate said hour-hand independently of any movement of said hour wheel, and a second pawl in driven connection with said hour wheel and in engagement with said star-shaped wheel to drive said latter on normal advance movement of said hour hand provoked by said hour wheel and to trail over said star-shaped wheel when the latter is driven by said toothed wheel on operation of said pusher.

3. In a watch, a pusher rotatable into two different positions, a star-shaped wheel, an hour-hand in connection with said star-shaped wheel, a toothed wheel coupled with said star-shaped wheel, an hour wheel, an oscillatory member adjusted to be swung by said pusher, a double-acting pawl adjusted to work upon said toothed wheel in the one or the other direction according as said pusher is in the one or the other of said two different positions, to produce movement of said star-shaped wheel in order to rotate said hour hand independently of any movement of said hour wheel, and a second pawl in driven connection with said hour wheel and in engagement with said star-shaped wheel to drive said latter on normal advance movement of said hour hand provoked by said hour wheel and to trail over said star-shaped wheel when the latter is driven by said toothed wheel on operation of said pusher.

4. In a watch, a pusher rotatable into two different positions, a star-shaped wheel, an hour-hand in connection with said star-shaped wheel, a toothed wheel coupled with said star-shaped wheel, an hour wheel, a spring, an oscillatory member engaged by said spring in order to be held in median position, said oscillatory member being adjusted to be rotated by said pusher against the effect of said spring in the one or the other direction according as the latter is in the one or the other of said two different positions, a double-acting pawl hinged on said oscillatory member adjusted to work upon said toothed wheel in the one or the other direction according as said pusher is in the one or the other of said two positions, to produce movement of said star-shaped wheel in order to rotate said hour hand independently of any movement of said hour wheel, and a second pawl in driven connection with said hour wheel in engagement with said star-shaped wheel to drive said latter on normal advance movement of said hour hand provoked by said hour wheel and to trail over said star-shaped wheel when the latter is driven by said toothed wheel on operation of said pusher.

5. In a watch, a bevel pinion, a rotatable shaft carrying said bevel pinion, a star-shaped wheel, an hour-hand in connection with said star-shaped wheel, a toothed wheel coupled with said star-shaped wheel, an hour-wheel, a gearing in engagement with said toothed wheel and in disengageable relation with said bevel pinion to produce movement of said star-shaped wheel in order to rotate said hour-hand independently of any movement of said hour wheel, and a pawl in engagement with said star-shaped wheel to drive said latter on normal advance movement of said hour hand provoked by said hour wheel and to trail over said star-shaped wheel when the latter is driven by said toothed wheel on operation of said shaft.

JEAN PIERRE GRAEF.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
504,432	Grunberg	Sept. 5, 1893
1,419,029	Doll	June 6, 1922
1,932,754	Spranger	Oct. 31, 1933

FOREIGN PATENTS

Number	Country	Date
114,722	Switzerland	Apr. 16, 1926
138,054	Switzerland	Apr. 16, 1930
170,141	Switzerland	Oct. 1, 1934