PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Wristlet Watch with Alarm Arrangement

We, GEBRUDER JUNGHANS AKTIENGESELLSCHAFT, a German Company, of Gaishaldenstrasse, Schrammerg/Black Forest, Wurttemberg, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a wrist watch comprising an alarm arrangement. In an existing construction, the winding crown, apart from serving its actual purpose and for setting time hands, serves also to set the alarm hand. This necesssitates a special setting of the stop member, which thus also has several functions.

According to the invention there is provided a wrist watch incorporating an alarm mechanism and including a crown for setting the alarm mechanism and a further crown for stopping the alarm mechanism, said two crowns being in addition to the usual crown for winding the common mainspring for the watch-mechanism and for the alarm-mechanism and setting the hour and minute hands, the crown for setting the alarm mechanism and the crown for stopping the alarm being arranged one on each side of the winding crown and symmetrically in relation thereto.

The arrangement of separate means for setting the alarm hand and for stopping the alarm while retaining the functions normally allotted to the winding crown in accordance with the invention, affords the advantage that errors in manipulation are avoided and the movement may be of simple construction. In external appearances the watch resembles so-called chronograph wrist watches.

The features of the invention are set forth in the claims. The advantages will be seen from the following description of an embodiment, given by way of example, and from the drawings, which illustrate the invention partly in diagrammatic form and on an enlarged scale, and in which:

Figure 1 is a development of the wheel assembly in section on the line A—B of Figure 3,

Figure 2 shows the movement as seen from the rear,

Figure 3 shows the movement as seen from the front,

Figure 4 shows details of the actuating members in front elevation,

Figure 5 shows the complete wrist watch in elevation, and

Figure 6 shows a development of the wheel assembly in section on the line C—D of Figure 3.

1 is the main plate of the movement. 2 is the winding stem with crown 3 and 4, 5, 6 are intermediate wheels, by which the spring winding wheel 7 on the spring core shaft 8 can be moved. 9 (Figures 1 and 2) is the spring barrel.

The wheel 6 is mounted on the rocker 10, which is in turn arranged to rock about the pin 11 of the wheel 5. Rotatably mounted with the rocker 10 is a further wheel 12 which is in constant meshing engagement with wheel 5 and rolls, during the rocking movement, on the periphery of the wheel 5. The catch lever 13 (Figure 4) serves in known manner to hold the rocker 10 fast in its end positions.

Mounted opposite the rocker wheel 12 opposite the plate 1 is the time hand seting wheel 14, which serves to drive the minute cannon 17 with pinion 18 through the intermediate wheel 15 with pinion 16 (Figure 3). 19 is the minute hand. In Figures 3 and 4, the rocker 10 is in the winding position, that is to say the rocker wheel 6 is in engagement with the spring winding wheel 7 which is carried along on rotation of the stem 2. For the purpose

of setting the time hands, the winding stem 2 is pulled out in the direction of the arrow 20. The rocker 10 is thus pivoted in the clockwise direction by the pawl 13 (Figures 3 and 4), the rocker wheel 6 is disengaged from the spring winding wheel 7 and the rocker wheel 12 engages with the time hand setting wheel 14. Rotational movement of the winding stem 2 when the rocker is in this position is transmitted through the wheels 12, 14, 15, 16, 18 to the minute cannon 17 (the transmission, with reduction, of the movement of the minute cannon pinion 18 to the hour wheel 21 is not shown in the drawings).

Three projections 21*a* are arranged on the hour wheel 21, opposite the alarm setting wheel 22, the said alarm setting wheel being mounted with an extension 22*a* (Figure 1) in a recess 1*a* in the plate 1. Three apertures 22*b* corresponding to the three projections 21*a* on the hour wheel 21 are formed in the alarm setting wheel 22. The projections 21*a* lie on different radii as also do the apertures 22*b* in order that the projections may engage in the apertures only once within twelve hours, that is to say within one complete revolution of the hour wheel 21. The purpose of the provision of three projections and three apertures is to cause the hour wheel 21 to bear on the alarm setting wheel at three points and thus to prevent tilting. The hour-wheel 21 is provided with a cannon 21*b*, which supports the hour hand 23. The alarm setting wheel 22 comprises in turn a cannon 22*c*, on which the alarm hand 24 is mounted. The alarm setting wheel 22 is set by means of a button 25 through the setting stem 26 and the wheels 27, 28, 29.

Since the projections 21*a* project in the manner of ratchet teeth from the face of the hour wheel 21, neither the time hand setting gear nor the alarm hand setting gear may (as known) be turned back oppositely to the direction determined by the direction of the projections 21*a*. In order to prevent this with certainty, a loop spring 30 is engaged over the alarm setting stem 26 and secured at one end to the plate 1 in order to act as a so-called silent click.

A spring finger 31 secured at 32 to the rocker 10 is provided to prevent the hand setting gear from being turned back. When the winding stem 2 is pulled out in the direction of the arrow 20, the rocker 10 carries out a rotational movement in the clockwise direction, the teeth of the rocker wheel 12 engage the time hand setting wheel 14 and the free end of the spring finger 31 engages with the teeth of the wheel 14 and prevents it from being turned back against the direction of the arrow 33.

As will be seen more especially from Figures 2 and 6, a single spring barrel 9 is provided, from which the movement regulator 34 receives its drive through the gearing 35, 36, 37, 38, 39, and the anchor 40, and from which the alarm hammer 41 receives its drive through the gearing 42, 43, 44, 45. The intermediate wheel 43 (Figure 3) is arranged in known manner on a rocker (the so-called alarm rocker) 46, the centre of rotation of which is designated by 47. The alarm rocker bears through an initially tensioned spring arm 46*a* against a fixed stop 48 on the plate 1. 49 is a further stop on the plate 1, the object of which is to limit the rotational movement of the alarm rocker 46 in the anti-clockwise direction (Figure 3). The alarm rocker is so arranged that during the winding movement of the spring winding wheel 7 (the direction of the arrow 50) the pinion 42 is driven against the spring action of the arm 46*a* while pivotting the alarm rocker in the clockwise direction about 47, that is to say, the alarm gear yields, while during the running down (contrary to the direction of the arrow 50) the spring winding wheel 7 presses the alarm rocker against the stop pin 49 while driving the pinion 42 and then transmits its rotational movement to the set of wheels 42, 43, 44, 45 and finally to the alarm hammer 41. The function of the alarm rocker is known, for example, in pocket alarm watches, as also are the means for the limited derivation of power for the alarm movement from the (single) driving spring. It will be seen from the drawings that the spring winding wheel 7, which is connected by means of a square portion to the spring core stem 8, drives the wheel 45 (the alarm escapement wheel) through the pinion 42, the wheel 43 and the pinion 44, while the spring barrel 9, which supports a further gear wheel, drives the anchor 40 through the pinion 35 and the set of wheels 36, 37, 38.

For the purpose of releasing the alarm movement by means of the time movement, a double-armed lever 51 is provided, which is rockably mounted at 52 (Figure 1) on the plate 1. The lever 51 presses by its arm 51*a* under the action of the spring 53 (Figures 1 and 3) against the lower side of the hour wheel 21. The other arm 51*b* of the lever 51 has three bends and engages with the lower side of the alarm hammer 41 in the region of a pin 54 let into the hammer, whereby it prevents the hammer (in the position shown in Figures 1 and 2) from rocking.

On the release of the alarm, the projec-

tions 21*a* on the hour wheel 21 fall into the apertures 22*b* of the alarm setting wheel 22. The spring 53 then presses the hour wheel 21 through the lever 51 in the direction of the dial 55 and at the same time the lever 51 rotates in the clockwise direction (Figure 1), whereby the lever arm 51*b* moves out of the range of the stop pin 54 of the alarm hammer 41, which can then rock unhindered.

To stop the alarm, a stop button 56 is mounted on the stop pin 57. The stop pin has a recess 57*a* (Figure 4) in which the stop lever 59 engages by means of a coupling pin 58. The stop lever is rockably mounted at 60 on the plate 1, and projects by means of its free end 59*a* into the rocking range of the alarm hammer 41 in the locking position. The position is produced by pressing the stop button 56 in the direction of the arrow 61. In order that the pin 57 may be held fast in the locking position and in the releasing position, it is provided with a double conical recess 57*b* (Figure 4), which co-operates with a forked catch spring 62.

The parts described co-operate in the following manner.

Winding the spring: The steam 2 is rotated by means of the crown 3, and the spring winding wheel 7 is actuated through wheels 4, 5, 6. The spring winding wheel 7 rotates the alarm rocker (Figure 3) idly in the clockwise direction about the point 47.

Setting of the time hands: The winding stem 2 is pulled out in the direction of the arrow 20, whereby the rocker 10 is moved in the clockwise direction, the wheel 6 being disengaged from the wheel 7. The wheel 12 is engaged with the wheel 14. The rotational movement of the stem 2 in the clockwise direction is transmitted through the wheels 14, 15, 16 to the hour wheel 21. The spring finger 31 prevents rotation of the stem 2 in the anti-clockwise direction.

Setting the alarm: The stem 26 rotates in the anti-clockwise direction. The rotational movement is transmitted by 27, 28, 29 to the alarm setting wheel 22, the alarm hand 24 thus being driven. The loop spring 30 prevents turning back of the alarm setting stem 26 (in the clockwise direction).

Alarm release: At the time to which the alarm is set, the projections 21*a* on the hour wheel 21 engage with the edges of the apertures 22*b* in the alarm setting wheel 22, whereby the hour wheel 21 is axially displaced under the action of the spring 53, which presses on the release lever 51 and rocks it simultaneously into the releasing position. The alarm hammer 41 is thereby released with its pin 54 on the arm 51*b* of the lever 51. The time movement spring can set the alarm hammer 41 in oscillation through the spring shaft 8, the spring winding wheel 7 and the wheels 42, 43, 44, 45, the alarm rocker 46 being forced against the stop 49.

Stopping the alarm: The alarm stop pin 57 is pressed in the direction of the arrow 61 by the button 56, whereby the stop lever 59 is rocked about the pivot 60 (Figure 3) in the anti-clockwise direction and the hammer 41 is stopped by the arm 59*a* of the stop lever 59.

What we claim is:—

1. Wrist watch incorporating an alarm mechanism and including a crown for setting the alarm mechanism and a further crown for stopping the alarm mechanism, said two crowns being in addition to the usual crown for winding the common mainspring for the watch-mechanism and for the alarm-mechanism and setting the hour and minute hands, the crown for setting the alarm mechanism and the crown for stopping the alarm being arranged one on each side of the winding crown and symmetrically in relation thereto.

2. Wrist watch according to claim 1, characterised in that a spring finger is provided on the rocker, the said spring finger engaging a time hand setting wheel when the rocker is rotated to the time setting position.

3. Wrist watch according to claim 1, characterised in that a loop spring is provided on the stem of the alarm setting crown, one end of said spring being secured to a fixed part of the watch mechanism, and said spring preventing reverse rotation of the alarm setting crown.

4. Wrist watch with alarm arrangement substantially as hereinbefore described with reference to the accompanying drawings.

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686,214 COMPLETE SPECIFICATION
1 SHEET
This drawing is a reproduction of the Original on a reduced scale.

Fig. 1

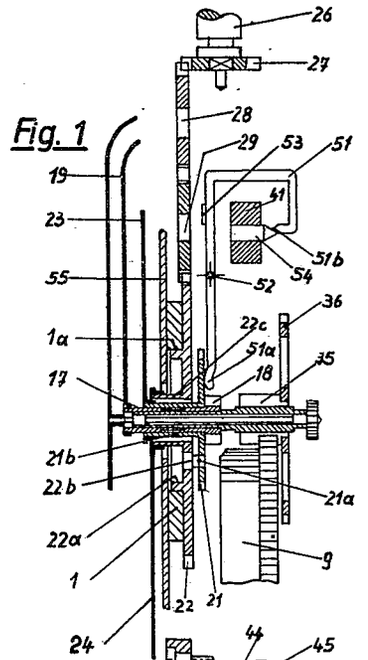

Fig. 2

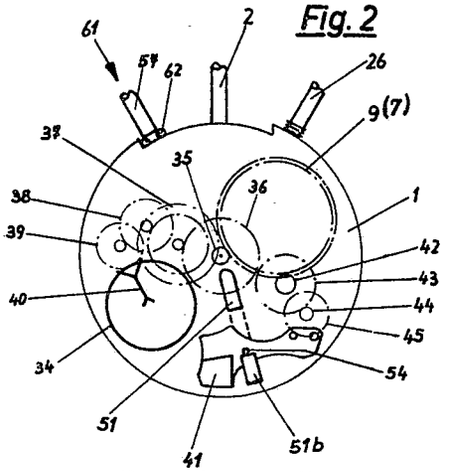

Fig. 5

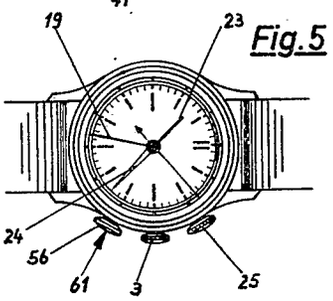

Fig. 6

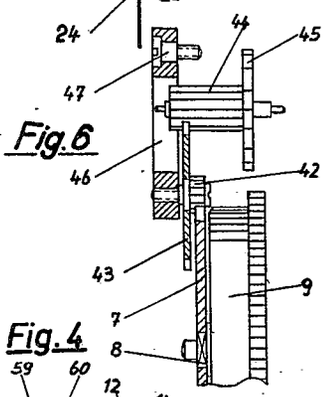

Fig. 3

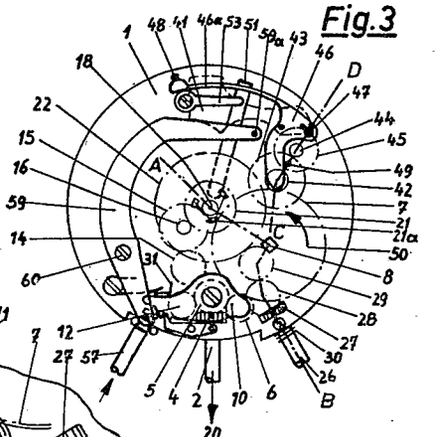

Fig. 4