April 11, 1967 S. SCHWAB 3,313,100

RELEASE MECHANISM FOR THE ELECTRIC WINDING SYSTEM OF AN ALARM

Filed Oct. 28, 1965 2 Sheets-Sheet 1

FIG. 1

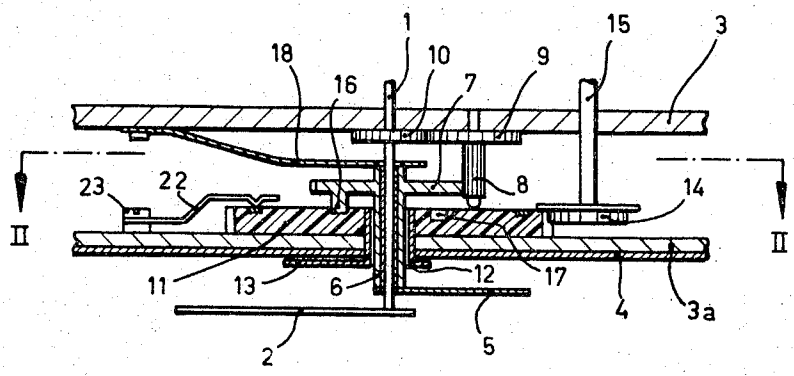
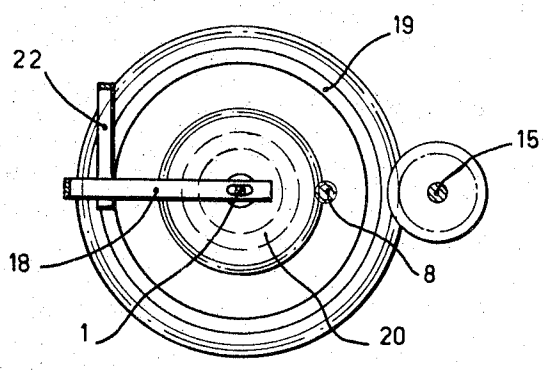


FIG. 2



April 11, 1967 S. SCHWAB 3,313,100

RELEASE MECHANISM FOR THE ELECTRIC WINDING SYSTEM OF AN ALARM

Filed Oct. 28, 1965 2 Sheets-Sheet 2

FIG.3

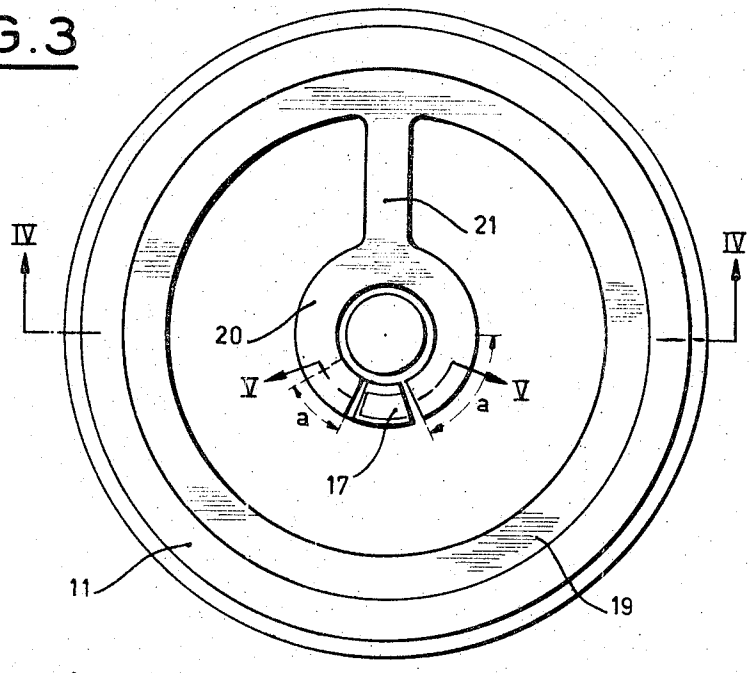


FIG.4

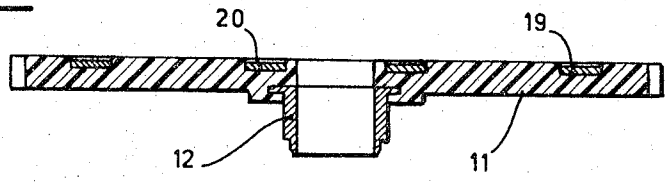
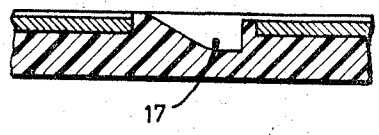


FIG.5



United States Patent Office 3,313,100 Patented Apr. 11, 1967

3,313,100

RELEASE MECHANISM FOR THE ELECTRIC WINDING SYSTEM OF AN ALARM

Samuel Schwab, Moutier, Switzerland, assignor to Louis Schwab S.A., Moutier, Switzerland

Filed Oct. 28, 1965, Ser. No. 505,523
4 Claims. (Cl. 58—41)

This invention has for object a release mechanism for the electric winding system of an alarm. The release of the ringing mechanism in alarm clocks results from the axial movement of an hour-wheel having a projection and of the wheel of the alarm having a corresponding slot, the two wheels moving toward another.

Already known are electric clocks functioning by means of a battery which supplies a motor for rewinding a spring jointly driving the movement and the striking mechanism of the clock. In such clocks, a device is provided to stop the rewinding of the spring during the release of the striking or ringing mechanism. This device in turn mechanically controls an electric contact. Such a device is complicated as well by the number and the arrangement of the parts that it requires and by the means necessary to insulate the conductive parts forming the contact. Also known is an electric alarm wherein a motor supplied by a battery operates directly activates a single spring for the movement of the striking work and in which a device released periodically by a cam, penetrating in a groove of the hour wheel allows the interposition in the electrical circuit of a resistance controlling the charge of the battery. Here, however, the device does not interrupt the functioning of the motor during ringing, and the contact is by means of blades which renders it vulnerable to oxidation.

This invention, which avoids these prior art drawbacks, has for object a release mechanism for the electric winding mechanism of an alarm, which mechanism is characterised by the fact that the hour wheel is conductive and by the fact that the alarm wheel is insulated and has two concentric conductive rings linked by a bridge and has a groove in an insulated portion provided in one of the rings, in such a way that when the projecting part of the hour wheel engages in the groove of the alarm wheel, the electrical winding circuit between the rings and the hour wheel is open while it remains closed while these are not engaged.

The annexed drawing represents one embodiment of the present invention, wherein:

FIGURE 1 is a cross-sectional view of the device according to the invention;

FIGURE 2 is a sectional view along line II—II, of FIGURE 1;

FIGURE 3 is a plan view of FIGURE 2;

FIGURE 4 is a sectional view along line IV—IV, of FIGURE 3;

FIGURE 5 is a sectional view along line V—V, of FIGURE 3.

In FIGURE 1, shaft **1** bearing the minute hand **2** is mounted between two plates of which only one is shown. The shaft passes through the face of the dial **4** mounted on the dial bearing plate **3***a*. The hour hand, **5** is secured on the pipe **6** of hour wheel **7** co-axially mounted around shaft **1**.

The hour wheel **7** is driven by a dial-train comprising pinion **8** integral with wheel **9** meshing with canon pinion **10** mounted on shaft **1**. An alarm wheel **11** turning around pipe **6** bears a socket **12** on which is mounted the alarm hand **13**. Wheel **14** borne on the extremity of a shaft **15** permits the angular movement of alarm wheel **11** and consequently that of alarm hand **13**.

The hour wheel **7** bears a finger **16** rubbing on the alarm wheel and adapted to engage in a groove **17** of the latter. To this effect, the hour wheel bears against the alarm wheel by means of a leaf spring **18** mounted by one of its extremities to plate **3** and which by its other and elongated extremity and (not shown) locks in its upper position or frees, in its lower position (when projection **16** is engaged in groove **17**), the oscillating mass, not shown, of the striking work.

The alarm wheel is formed of insulating material. As shown in FIGURES 3 and 4, the same has encased in its surface, two concentric conductive rings **19** and **20** linked by a bridge **21**. The inner ring **20** has, on one section, groove **17** formed in the insulating mass of the alarm wheel. The conductive part of ring **20** is interrupted around groove **17**.

The hour wheel **7** is conductive and electrically linked to the mass of the movement, and its projection **16** having a configuration corresponding substantially to that of groove **17**, normally rubs against ring **20**. A brush **22** fixed to an insulating stud **23** of the watch dial holder **3***a* continuously rubs on conductive ring **19**. In such a position, where the hour wheel bears by its projection on the track **20** of the alarm wheel owing to the elastic pressure of leaf spring **18**, the striking work is mechanically locked by the leaf spring and the electric circuit is closed. This electric circuit comprises a pole of a current source, not shown, brush **22**, ring **19**, bridge **21**, ring **20**, projection **16**, hour wheel **7** and the mass of the movement. This circuit goes from the pole *a* of the current source to the release device for re-winding the alarm. If the requisite conditions for re-winding are fullfilled, this device can operate while the striking work is not operative. On the contrary, when the finger of the hour wheel engages in the groove of the alarm wheel and a little before this, the electrical circuit is open. The striking work is then set off but the electric re-winding cannot take place until the moment where the finger, having emerged from the projection, again enters in contact with ring **20**.

This mechanism advantageously avoids, during release of the striking work which release usually uses up two or three barrel turns, the inter-locking of the re-winding of the spring which occurs after only one turn of the barrel and thereby ensures a good functioning. In effect, if this mechanism were not provided, there would be a continuous release of the striking work since before the termination of the striking. (After two or three turns of the barrel, re-winding would occur after one turn of the barrel.) Or, it would be necessary to re-wind after a greater number of barrel turns which would interfere with the steady functioning of the movement as a result of the difference in the tension of the spring.

Ring **20** may be interrupted along two arcs *a*, as shown on FIGURE 3, in such a way that re-winding only occurs at a given time before and after the functioning of the alarm. Ring **20** also can be positioned in such a way as to operate other attention-getting means, for example a small transistorised radio or an electric vibrator and the like.

It will be understood that many variations of the present invention are possible without departing from the spirit and scope thereof otherwise then as indicated in the appended claims. Thus, for example, there can be disposed at least one conductive ring on the other face of the insulating alarm wheel.

What is claimed is:

1. In a release system for the electric rewinding system of an alarm clock having a source of current in the re-winding circuit

(A) an angularly movable insulated alarm wheel having a groove therein;

(B) a conductive hour wheel having a projection

adapted to fit in said groove, and electrically connected to said circuit;

(C) resilient means urging said projection in said groove;

(D) electrically connected inner and outer concentric rings secured on said alarm wheel, said inner ring having a cut away section permitting access of said projection into said groove;

(E) said resilient means urging said projection against said inner ring whereby said electric rewinding circuit is open when said projection engages in said slot and closed when said projection contacts said ring.

2. A system according to claim 1, wherein said wheels are coaxially mounted.

3. A system according to claim 1, having an electrical contact brush mounted insulatingly on said clock and in contact with said outer ring.

4. A system according to claim 1, wherein said inner ring is interrupted along two arcs thereof.

No references cited.

RICHARD B. WILKINSON, *Primary Examiner.*

STEPHEN J. TOMSKY, *Examiner.*

G. F. BAKER, *Assistant Examiner.*