ALARM CLOCKS AND WATCHES

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ABSTRACT

An alarm clock or watch which includes a hammer pivotally mounted for reciprocal movement intermittently to engage a gong to produce an audible noise, and a trip member and a switch member each independently movable between a respective first position at which it intercepts the hammer to prevent or restrict movement of the hammer and a respective second position at which it does not prevent or restrict movement of the hammer, the trip member being resiliently mounted and the hammer having an angled face at a portion which can contact the trip member whereby if the trip member is moved from its second position to its first position when the hammer is in a position such that the trip spring in its first position lies between the hammer and the rest position of the hammer and when, if the switch member is moved to its first position, the angled face of the hammer can cam the trip member out of the path of the hammer to permit the hammer to return to a rest position without damage to the trip member or the hammer.

4 Claims, 6 Drawing Figures
ALARMCLOCKS AND WATCHES

BACKGROUND OF THE INVENTION

The invention relates to improvements in alarm clocks and watches.

According to the invention there is provided an alarm clock or watch including a hammer pivotally mounted for reciprocal movement intermittently to engage a gong to produce an audible noise, and a trip member and a switch each independently movable between a respective first position at which it intercepts or restricts movement of the hammer and a respective second position at which it does not so prevent or restrict movement of the hammer, in which movement of the switch member from its second to its first position is effective to ensure that the hammer is moved to a rest position adjacent a determined one of the extremities of its reciprocal movement and in which the trip member is resiliently mounted and the hammer has an angled face at a portion which contacts the trip member in the first position of the trip member, whereby if the trip member is moved from its second position to its first position when the hammer is in a position such that the trip spring in its first position lies between the hammer and the rest position of the hammer and the switch member is subsequently moved from its second position to its first position, the angled face of the hammer cams the trip member out of the path of the hammer to permit the hammer to return to its said rest position without damage to the trip member or the hammer.

The trip member is advantageously a spring, the position of which is controlled by a gear train coupled to the normal time-keeping mechanism of the clock or watch so that at a determined and settable instant the trip member is moved from its first position into its second position to permit oscillation of the hammer to strike the bell or the like. The switch member is advantageously an axially movable pin having at its outer end a button for engagement by a finger of an operator, depression of the button moving the switch member from its second position into its first position to prevent further oscillation of the hammer.

The angled face of the hammer is advantageously provided on a triangular lug projecting from the hammer and the axially movable pin forming the switch member is advantageously conically pointed at the end which engages the hammer whereby depression of the switch member when an edge of the hammer lies thereon prevents camming of the hammer into the rest position.

PREFERRED EMBODIMENT OF THE INVENTION

The invention is diagrammatically illustrated by way of example in the accompanying drawings, in which:

FIG. 1 is a front view of an alarm clock or watch according to the invention with a trip member and a switch each in their respective second positions;

FIG. 2 is a plan view taken on line II—II of FIG. 1; and

FIGS. 3a to 3d illustrate a progressive changeover of relative position of a hammer and a trip member in an alarm clock or watch according to the invention.

Referring to the drawings, an alarm clock or watch comprises two gear trains 12, 15 running in pivot holes provided in parallel plates, namely a front plate 9 and a back plate 10, with a dial disposed parallel to the plates 9 and 10. One of the gear trains 12 transmits a torque stored in a wound-up mainspring 13 through an escapement 11 to oscillate a hammer 3 through a predetermined amplitude and duration. The other gear train 15 transmits the torque stored in the same said wound-up mainspring 13 to rotate an hour wheel 6 at controlled angular velocity and to cause the normal movement of hands of the clock or watch by a mechanism of known kind.

The oscillation of the hammer 3 can be controlled by (a) a switch staff 1 and (b) a trip spring 4, as described below.

The switch staff 1 can be reciprocated axially by manual pressure within a bush 2 which is riveted to the back plate 10 to predetermined limits. As shown sectioned in FIG. 2, part of the circumference of the switch staff 1 is located within the angular oscillation limits of the hammer 3. The switch staff 1 is then in its "second" position, (FIGS. 1 and 3a). When the switch staff 1 is pushed in manually in the direction of arrow B of FIG. 3b, the conical point ensures a gradual engagement with the edge of the hammer 3, (FIGS. 3b and 3c), thereby rotating the hammer 3 clockwise as shown by arrow A in FIG. 2. At the lowest position of the switch staff 1 (FIG. 3d), the circumference of the switch staff 1 lies within the angular oscillation limits of the hammer 3 and oscillation of the hammer 3 is prevented. The switch staff 1 is then in its "first" position.

The hammer 3 has a triangular hammer lug 3a thereon. The trip spring 4 is fixed at one end to the front plate 9 (the right hand end as shown in FIG. 2), the other end being bent and extending towards the hammer lug 3a through an opening in the front plate 9. The free position of the trip spring 4 is further away from the front plate 9 as shown in dotted lines in FIG. 1 but is compressed by the hour wheel 6 to its "second" position as shown in FIG. 1 or to its "first" position as shown in FIGS. 3a to 3d. The hour wheel 6 is provided with two cam lugs 7 to engage two corresponding openings in an indicator wheel 5. The hour wheel 6 is driven to rotate about the same axis as the indicator wheel 5 through the gear train 15 by the torque restored in the wound-up mainspring 13. The indicator wheel 5 is normally stationary but can be manually rotated to any desired angular position. Rotation of the hour wheel 6 permits the cam lugs 7 to engage in the openings in the indicator wheel 5, to permit the hour wheel 6 to move axially towards the indicator wheel 5 under the bias of the trip spring 4, to permit said other end of the trip spring 4 to move to its "second" position (shown in full lines in FIG. 1), in which it does not interfere with oscillation of the hammer 3. Further rotation of the hour wheel 6 beyond a determined extent will cause the cam lugs 7 to lift the hour wheel 6 away from the indicator wheel 5 to move the trip spring 4 to its "first" position (FIGS. 3a and 3d), in which the end of the trip spring 4 lies within the path of oscillation of the hammer lug 3a and prevents oscillation of the hammer 3.

In operation, when the switch staff 1 and the trip spring 4 are respectively in their "second" positions, the hammer 3 is free to oscillate and to strike a gong 14, to produce an audible noise, until the end of its predetermined period. The hour wheel 6 rotation continues, and lifts the trip spring 4 from the hammer lug 3a as described above. The trip spring 4 engages the hammer lug 3a either on the inside or on the outside of hammer lug 3a depending on the final position adopted by the hammer 3 at the end of its oscillation period.

When the end of the trip spring 4 engages the hammer lug 3a on the outside of the hammer lug 3a manual push-in of the switch staff 1 results in a clockwise angular displacement of the hammer 3 about its pivot in the direction of arrow A of FIG. 2, with the hammer lugs 3a simultaneously moving away from the end of the trip spring 4 to the position shown in FIG. 3d.

When the end of the trip spring 4 engages the hammer lug 3a on the inside of the hammer lug 3a, as shown in FIG. 3e) manual push-in of the switch staff 1 results in a clockwise angular displacement of the hammer 3 about its pivot in the direction of arrow A of FIG. 2, to cause the hammer lug 3a to bear against the end of the trip spring 4.

The inside face of the hammer lug 3a is angled so that, as shown sequentially in FIGS. 3a to 3d, when the hammer lug 3a bears against the end of the trip spring 4, as a result of movement of the switch staff 1 to its first position, the angled face of the hammer lug 3a causes the trip spring 4 to spring downwards in the direction of arrow C of FIG. 3b as the hammer 3 is turned clockwise by the switch staff 1 in the direction of arrow A. Further push-in of the switch staff 1
forces the trip spring 4 further downwards as the hammer 3 is rotated further clockwise until a point D on the hammer lug 3a (FIG. 3b) is reached and passed and the trip spring 4 can spring upwardly and rest against the outside of the hammer lug 3a.

Thus, regardless of the position of the hammer 3 at the end of its oscillation, the switch staff 1 can be pressed in, to its first position, without risk of damage to the hammer 3 or the bearings on which the hammer 3 is mounted, since movement of the hammer 3 is not prevented by the trip spring 4. The push-in section of the switch staff 1 always restores the hammer 3 to a rest position, with the trip spring 4 always on the outside of the hammer lug 3a, as shown in FIG. 3d.

We claim:

1. An alarm mechanism comprising, a hammer pivotally mounted for reciprocal movement intermittently to engage sound producing means to produce an audible noise, a resiliently mounted trip member movable between a first hammer restricting position and a second hammer freeing position under the control of an horological movement, and a switch member, said switch member comprising an axially movable pin having an exposed outer end engageable by the operator for moving said pin independently of said trip member from a second position spaced from the plane of movement of said hammer to permit oscillation of the latter to an inner, first position engaging said hammer for moving the same to a rest position thereby restricting movement of said hammer, said hammer being formed with a lug having a straight face which cooperates with said trip member in said first position to restrict said hammer and an angled face which contacts said trip member in the first position of said trip member, whereby if said trip member is moved from its second position to its first position when said hammer is in a position such that said trip member in its first position lies between said hammer and the rest position of said hammer, and said switch member is subsequently moved from its second position to its first position, the angled face of said hammer cams said trip member out of the path of said hammer to permit said hammer to return to its said rest position without damage to said trip member or to said hammer.

2. An alarm mechanism as claimed in claim 1, wherein said trip member is a spring.

3. An alarm mechanism as claimed in claim 1, wherein said lug is a triangular projection from said hammer.

4. An alarm mechanism according to claim 1, wherein said axially movable pin is conically pointed at its inner end which engages said hammer, whereby depression of said pin when an edge of said hammer lies therebeneath causes camming of said hammer into its rest position.