FIG. 1

FIG. 2

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ATTORNEYS.
CLOCK WITH SIGNAL CONTROL MECHANISM

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This invention relates to a clock with a tripping mechanism for actuating a signal, and more particularly to such a clock having a control mechanism for stopping the signal after a predetermined interval of time.

In a preferred embodiment of the invention, the control mechanism is carried and actuated by the tripping mechanism when the latter is tripped at a pre-determined time, but thereafter acts independently of the tripping mechanism to interrupt the actuated signal although the tripping mechanism remains tripped.

A fuller understanding of the invention can be had by referring to the accompanying drawings wherein:

FIGURE 1 is a perspective showing a clock having the tripping and control mechanisms of the invention;

FIGURE 2 is a fragmentary elevation of the clock of FIGURE 1 showing the movement thereof and the tripping and control mechanisms both in their inoperative positions;

FIGURE 3 shows the tripping mechanism in its tripped position and the control mechanism in its operative position;

FIGURE 4 shows the control mechanism in its tripped position; and

FIGURE 5 is a fragmentary section on an enlarged scale taken along the line V—V of FIGURE 3 showing a detail of the control mechanism.

Referring to the drawings, the tripping mechanism shown in FIGURE 2 of the clock has a tripping lever 1, shown partly in phantom, pivoted on a pin 2 projecting from the frame of the clock. The lever has a nose 3 which follows the cam surface of a tripping cam 4. The tripping cam 4 preferably rotates once every 24 hours and is driven by an hour wheel 5 of the clock movement of which the details are not otherwise illustrated. A spring 6 mounted on the frame serves to keep the nose 3 against the cam 4 and to move the tripping lever 1 into the tripped position (FIGURES 3 and 4) when the cam notch 7 is aligned with the nose 3.

A differential 8 arrangement, for example, a planetary gear means, schematically illustrated in the drawings, permits the angular position of the cam 4 to be adjusted to pre-determine the time tripping of the lever 1 will occur. A knob (not shown) accessible externally of the clock and mounted on a shaft 9 drives a pinion 10 on the shaft 9 and the differential 8 through an intermediate wheel 11 to set the tripping time.

A control lever 12 also mounted on the pin 2 has an arm 12a extending therefrom to actuate the signal-making means 13, for example, by engaging an arm 14 of the signal-making means 13 to move the arm 14 toward another arm 15 thereby making contact between two contact points 16 to complete an electrical circuit, e.g., for an electric alarm or for other uses. The control lever 12 is moved to its operative position closing the contacts 16 (FIGURE 3) by the tripping lever 1 when the latter is tripped by the tripping cam 4. The control means to be described hereinafter provides the linkage between the tripping 1 and control 12 levers.

Because the tripping cam 4 rotates relatively slowly, the return of the tripping lever 1 to its inoperative position, and de-actuation of the signal, by movement of the cam notch 7 out of alignment with the lever nose 3 requires a prolonged period of time and does not conveniently provide for adjustment of the duration of the signal, particularly to rather precise intervals on the order of a few minutes or a few seconds. It is an object of this invention to provide such adjustability and precision of the signal interval, and accordingly a control mechanism is provided.

A control cam 17 mounted on a shaft 18 controls the movement of the control lever 12 with, and with respect to, the tripping lever 1. An end 12b of the control lever 12 rides against the control cam 17 under the influence of a spring 28. As shown in FIGURE 5, the shaft 18 is journaled at one end for pivotal movement in a part 19 of the frame of the clock and the other end is journaled in the tripping lever 1. When the tripping lever is tripped and moves to its tripped position, the shaft 18 is angularly displaced from the position illustrated by the broken line 22 to the position shown in FIGURE 5. A pinion gear 20 on a collet 21 of the shaft 18 engages, in the tripped position, a drive wheel 23 driven at a stepped-up rate by the hour wheel 5. Thus, the control cam 17 is actuated simultaneously with the signal by the tripping mechanism.

The control lever 12 is tripped by the rotating control cam 17 and moved from its operative position (FIGURE 3) to its tripped position (FIGURE 4) to open the contacts 16 and to stop the signal-making means 13 while the tripping lever 1 remains in its tripped position. The time interval during which the signal is actuated is determined by the rate of rotation of the control cam 17 and its initial angular position with respect to the control lever end 12b following it. That position can be adjusted by the return means for the control cam 17. A hair spring 24 secured to the collet 21 on the shaft 18 is attached to a post 25 on a part 26 of the clock frame. When the tripping lever 1 is returned by the tripping cam 4 to its inoperative position, the gear 20 of the shaft 18 is disengaged from the wheel 23 and the hair spring 24 coiled on the shaft 18 returns the control cam 17 to its initial position. By altering the position attachment of the spring 24 to the post 25, the tension on the spring can be adjusted, in a manner similar to adjusting the beat of a clock balance wheel, to alter the initial position and pre-determine the interval during which the signal is actuated.

A pin 27 extending from the frame through an oblong opening in the tripping lever 1 acts as a stop for the control lever 12 to limit its movement when tripped. It will be noted from FIGURE 4 that as the tripping lever 1 is returned to its initial position, the control cam 17 will be moved out of contact with the lever arm 12b whose movement is limited by pin 27. The cam 17 is then free to be rotated and returned by the spring 24.

It is of course to be understood that numerous changes and modifications of the embodiment described and shown to illustrate the invention will be apparent to and can be made by persons skilled in the art without departing from the scope of the invention as defined in the appended claims.

I claim:

1. In a signal-tripping horological device having a clockwork mechanism and a frame, the improvement which comprises: a signal-tripping mechanism including a rotatable tripping cam mounted on said frame; a signal driven by said clockwork mechanism, a tripping lever pivotally mounted on said frame adapted to follow said tripping cam and to be moved thereby at pre-determined times between inoperative and tripped positions, a contact means adapted to be closed to actuate said signal and to be opened after a pre-determined interval to stop said signal.
3,324,644

signal, and a contact control lever pivotally mounted on said frame adapted to close and open said contact means and adapted to be moved by said tripping lever from a first position to a second position thereby closing said contact means; and a control mechanism including a shaft pivotally mounted between said frame and said tripping lever adapted to be drivingly engaged by said clockwork mechanism when said tripping lever is in its tripped position, and a control cam mounted on said shaft adapted to move said contact control lever from its second position to another position thereby opening said contact means, said contact control lever in its second position being adapted to follow said control cam.

2. A clock as defined in claim 1 wherein said tripping and said contact control levers are both pivotally mounted on a common pin extending from said frame.

3. A clock as defined in claim 1 having a hair spring on said shaft anchored to said frame for rotatably returning said control cam to an initial position when said shaft is disengaged from said movement by the return of said tripping lever to its inoperative position.

4. A clock as defined in claim 3 having a stop means to limit the movement of said contact control lever from its second position to less than the movement of said tripping lever when the latter is returned to its inopera-

5. A clock as defined in claim 4 wherein said control cam is in contact with said contact control lever in its first position.

6. A clock as defined in claim 3 wherein the anchorage or said spring is adjustable to alter the tension in said spring whereby the initial position of said control cam can be adjusted to pre-determine the interval of the signal.

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