June 13, 1967 M. BEGUIN 3,324,644

CLOCK WITH SIGNAL CONTROL MECHANISM

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FIG. 1

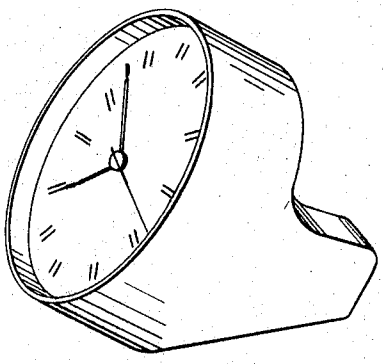
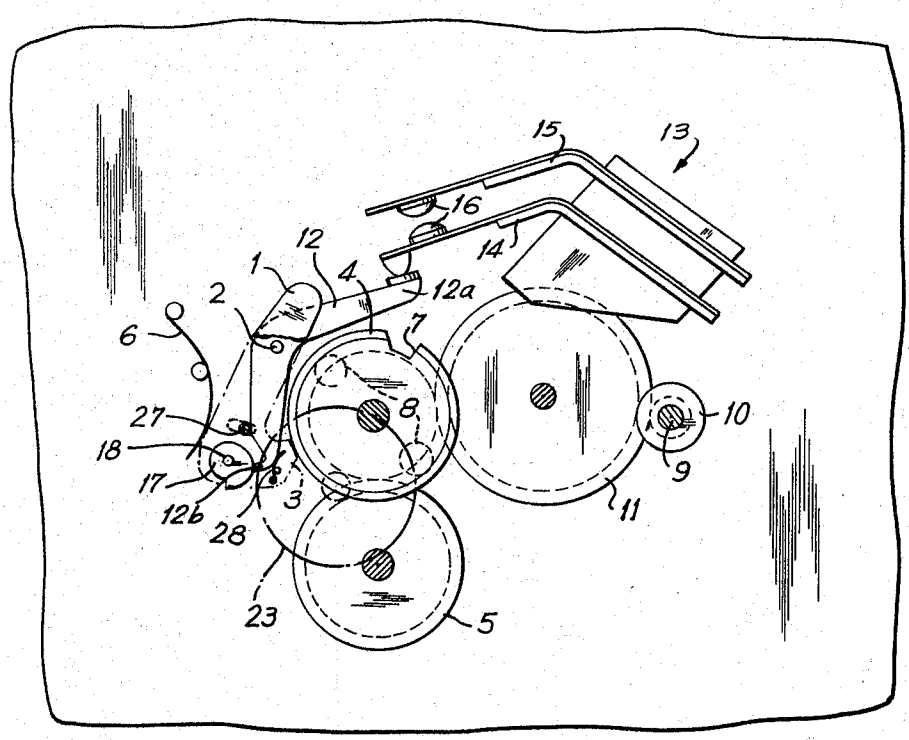


FIG. 2



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FIG. 3

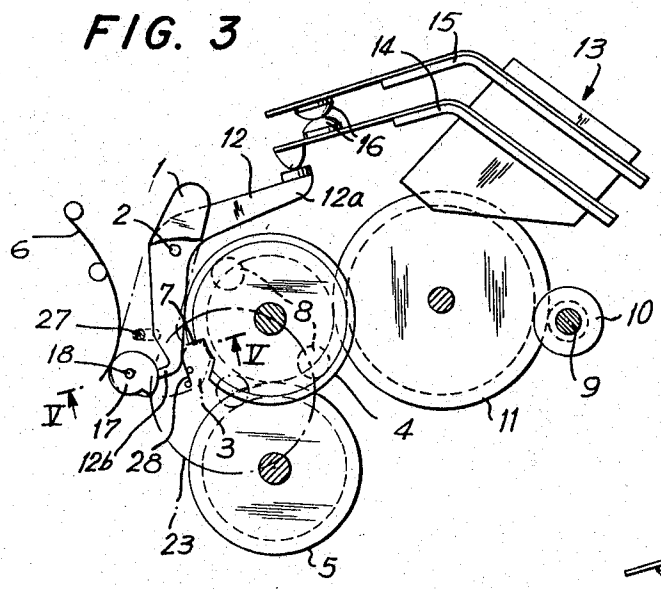


FIG. 4

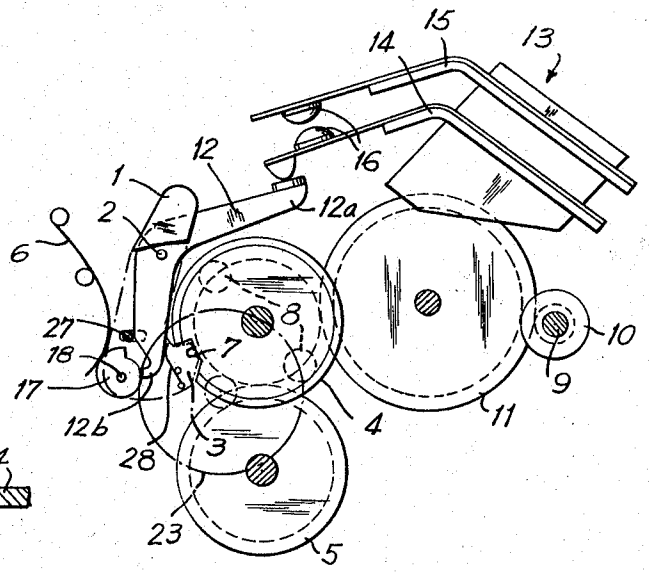
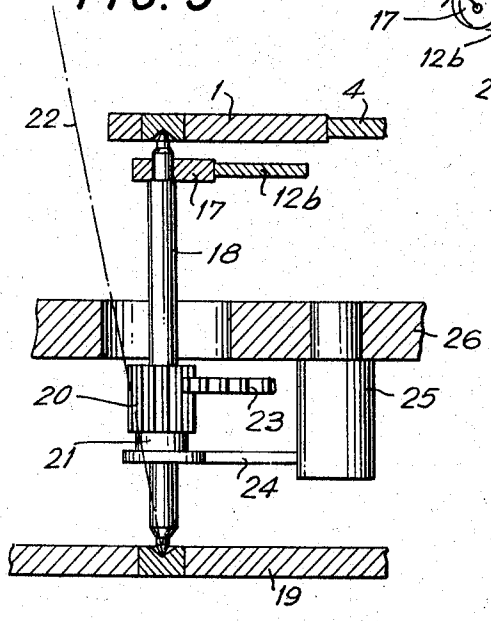


FIG. 5



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3,324,644

CLOCK WITH SIGNAL CONTROL MECHANISM

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6 Claims. (Cl. 58—20)

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 pre-determined 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 **1** has at one end 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 **12***a* 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 adapted to be 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 hereinbelow 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 **12***b* 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 **12***b* 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 rotates it to return the control cam **17** to its initial position. By altering the position of 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 when the tripping lever **1** is returned to its initial position, the control cam **17** will be moved out of contact with the lever arm **12***b* 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 and 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, 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 inoperative position whereby said control cam and said contact control lever are disengaged to permit rotation of said control cam to its initial position.

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.

References Cited

UNITED STATES PATENTS

496,667	5/1893	Porter	58—21.15
2,507,216	4/1950	Moss	58—20
3,131,267	5/1964	Schneiter	200—38

FOREIGN PATENTS

761,484	3/1934	France.

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