Oct. 14, 1924. 1,511,893

P. S. LUTTRELL ET AL

TIMING DEVICE

Filed March 21, 1921 2 Sheets-Sheet 1

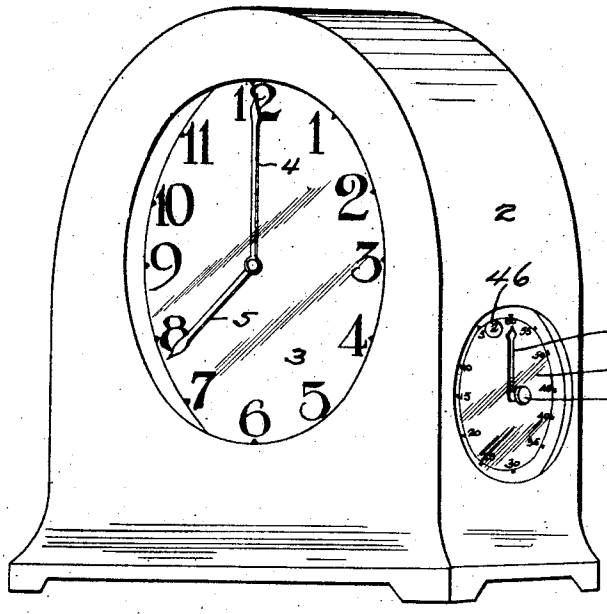


Fig. 1

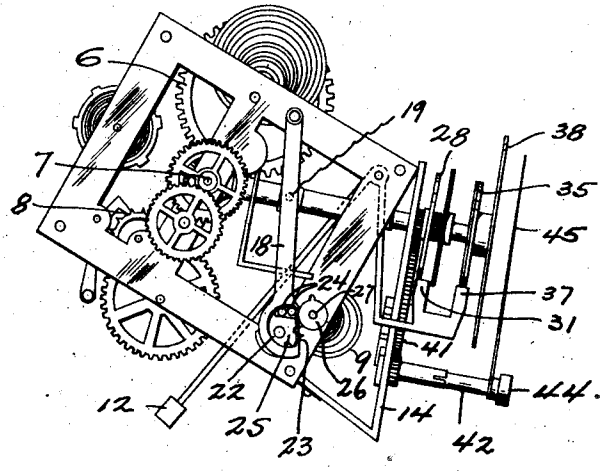


Fig. 2

WITNESS:
H. A. Sherburne

INVENTORS
PAUL S. LUTTRELL
AND PAUL C. ROSTE
BY White & Post
their ATTORNEYS.

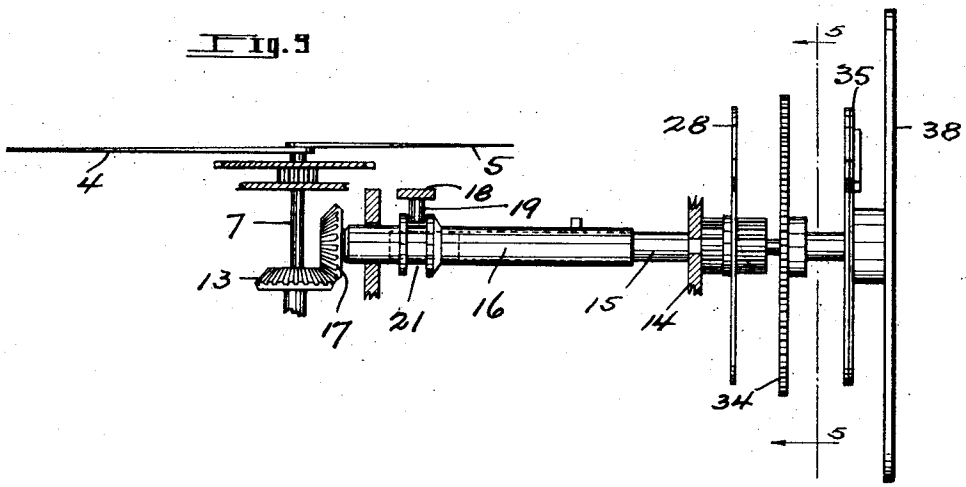
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Fig. 3



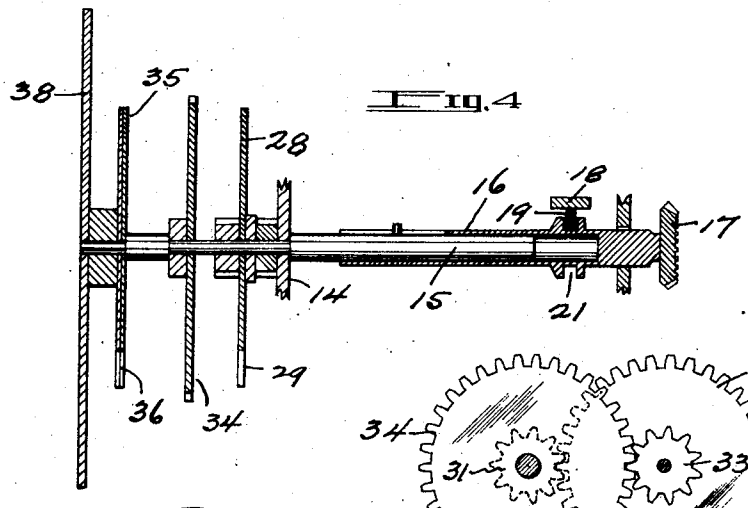


Fig. 4

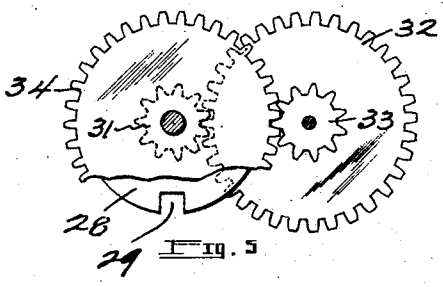


Fig. 5

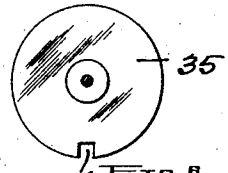


Fig. 6

WITNESS:
H. A. Sherburne

INVENTORS
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Patented Oct. 14, 1924. 1,511,893

UNITED STATES PATENT OFFICE.

PAUL S. LUTTRELL AND PAUL C. ROSKE, OF OAKLAND, CALIFORNIA.

TIMING DEVICE.

Application filed March 21, 1921. Serial No. 453,925.

To all whom it may concern:

Be it known that we, PAUL S. LUTTRELL and PAUL C. ROSKE, citizens of the United States, and residents of Oakland, county of Alameda, and State of California, have invented a certain new and useful Timing Device, of which the following is a specification.

The invention relates to timing devices and particularly to alarm clocks that may be set to sound an alarm when a predetermined interval of time has elapsed.

An object of the invention is to provide an alarm clock which may be set to sound the alarm at the end of a definite predetermined time.

Another object of the invention is to provide an improved alarm trip mechanism.

A further object of the invention is to improve the construction of the device of the character described, to make it simple and substantial and cheap to manufacture.

The invention possesses other advantageous features, some of which, with the foregoing, will be set forth at length in the following description, where we shall outline in full, that form of the invention which we have selected for illustration in the drawings accompanying and forming part of the present specification. In said drawings we have shown one embodiment of our invention, but it is to be understood that we do not limit ourselves to such form, since the invention, as set forth in the claims, may be embodied in a plurality of forms.

Referring to said drawings:

Figure 1 is a perspective view of the device of our invention.

Figure 2 is a front elevation of the mechanism.

Figure 3 is a detail elevation of the elapsed interval alarm setting mechanism.

Figure 4 is a cross section of the alarm setting mechanism.

Figure 5 is a section taken on the line 5—5, Figure 3.

Figure 6 is a detail elevation of one of the elapsed time setting discs.

The device comprises a suitable casing 2 in which the clock mechanism is disposed. The casing is provided with a clock dial 3, over which the time indicating hands 4—5 are moved by the clock mechanism 6. Any desirable clock mechanism may be employed and we do not limit ourselves to the particular clock mechanism shown. The minute hand 4 is driven by the time shaft 7, whose movement is controlled by the escapement mechanism 8 and the hour hand 5 is driven from the time shaft by the customary gearing.

The clock is provided with a suitable alarm mechanism, driven by the spring 9, which mechanism, when released, causes the vibration of the alarm hammer 12, causing it to strike a bell, not shown, arranged within the casing. Means are provided for releasing the alarm mechanism after a definite predetermined elapsed time interval, to cause the alarm to sound.

Secured to the time shaft 7 is a bevel gear 13, which is adapted to be engaged by the alarm releasing mechanism. Journaled in the clock frame and in the bearing plate 14 is a shaft 15, to which is splined a sleeve 16, carrying on its inner end a bevel gear 17 adapted to mesh with gear 13. Means are provided for moving the sleeve to move the gear 17 into and out of mesh with gear 13. Pivoted to the clock frame is a lever 18, provided intermediate its ends with a pin 19, engaging in the annular groove 21 on the sleeve 16, so that rocking movement of the lever causes longitudinal movement of the sleeve. At its free end, the lever is provided with an arc shaped aperture 22 having a flat side 23, and pins 24, secured to the Geneva gear 25, are disposed in the aperture. The Geneva gear is mounted on the clock frame and partial rotation of the gear causes the lever to be shifted. Movement of the Geneva gear in a clockwise direction causes a movement of the end of the lever to the right and movement of the gear in a counter-clockwise direction causes a movement of the free end of the lever to the left. A movement to the left meshes gears 13 and 17 and a movement to the right separates the gears. The Geneva gear is rotated in a step-by-step movement by a single toothed gear 26 secured to the end of the alarm spring shaft 27. When the alarm spring is wound, the Geneva gear is rotated in a counter-clockwise direction bringing the time shaft into connection with the alarm control shaft 15, and conversely, when the alarm spring unwinds, during the sounding of the alarm, the time shaft is separated from the alarm control shaft.

Secured to the alarm control shaft is a disc 28 having a notch 29 therein, into which the tooth 31 of the alarm trip lever must move as the alarm hammer vibrates.

Journaled on the shaft 15 and connected to the disc 28 or to the shaft by a suitable train of gears 31—32—33—34 is a second disc 35 having a notch 36 therein into which the tooth 37 of the alarm trip lever must move as the alarm hammer vibrates. The gear train connecting the two discs is such that the disc 28 makes twelve revolutions for each revolution of the disc 35. This is due to the fact that in the present construction the disc 28 represents minutes and the disc 35 represents hours, and the alarm control shaft makes one revolution per hour, but the relative speeds of the two discs may be in a different ratio if other time units are selected. In order that the alarm hammer may be free to vibrate, both notches 29 and 36 must be in position to permit the entry of the teeth 31 and 37 and if either disc is rotated slightly, the alarm cannot sound.

Secured to the disc 35 is a dial 38, marked with numbers representing hours, which rotates with the disc 35. Engaging the shaft 15, through the medium of a gear train 41, is an elapsed time setting shaft 42 which extends through the center of a dial 43, arranged in the casing, the dial 43 being graduated in minutes. The dial 43 is shown disposed at the side of the casing, but it may be arranged in any other desired position. Secured to the shaft 42 is a setting knob 44 and an indicator 45, movable over the dial 43, to indicate the elapsed time interval for which the alarm is set. The disc 28 moves synchronously with the indicator 45. The dial 43 is provided with an aperture 46 through which the successive numbers on the dial 38 are visible.

When it is desired to set the alarm to sound at the end of a predetermined time interval, the knob 44 is turned until the desired time interval is indicated on the dials 38 and 43 and then the alarm spring is wound. This places the alarm control shaft in connection with the time shaft, so that the two shafts rotate synchronously. At the end of the time interval, the discs 28 and 35 have moved to bring the notches under the teeth on the alarm trip lever and the alarm is sounded. The unwinding of the alarm spring moves the alarm control shaft out of engagement with the time shaft.

In Fig. 1, the alarm is set to sound at the end of a two-hour interval, but it may be set for any desired interval of hours and minutes, within the range of the device, which, in the present instance, is twelve hours. The device permits the accurate timing of operations requiring exact and accurate timing in minutes or hours and minutes.

We claim:

1. In a timing device, a timing mechanism, an alarm mechanism, a spring for driving the alarm mechanism, an alarm trip controlling mechanism, and means operative by the winding of the alarm spring for connecting the timing mechanism and the alarm trip controlling mechanism.

2. In a timing device, a timing mechanism, an alarm mechanism, a spring for driving the alarm mechanism, an alarm trip controlling mechanism normally out of engagement with the timing mechanism, and means operative by the winding of the alarm spring for connecting the timing mechanism and the alarm trip controlling mechanism and operative by the unwinding of the alarm spring for disconnecting the timing mechanism and the alarm trip controlling mechanism.

3. In a timing device, a time shaft, an alarm mechanism, a spring for driving said mechanism, an alarm trip controlling shaft normally out of engagement with the time shaft, and means operative by the winding of the alarm spring for establishing connection between the time shaft and the alarm trip control shaft.

4. In a timing device, a time shaft, an alarm mechanism, a spring for driving said mechanism, an alarm trip controlling shaft, a sleeve splined to said control shaft and normally out of engagement with the time shaft, and means operative by the winding of the alarm spring for moving the sleeve longitudinally into engagement with the time shaft.

5. In a timing device, a time shaft, a gear on said shaft, an alarm mechanism, a spring for driving said mechanism, an alarm trip controlling shaft, a sleeve splined to said control shaft, a gear on said sleeve normally out of engagement with the gear on the time shaft and means operative by the winding of the alarm spring for moving the sleeve longitudinally to bring said gears into mesh.

6. In a timing device, a time shaft, a gear on said shaft, an alarm mechanism, a spring for driving said mechanism, an alarm trip controlling shaft, a sleeve splined to said control shaft, a gear on said sleeve normally out of engagement with the gear on the time shaft, a lever engaging said sleeve and means operative by the winding of the alarm spring for moving the lever to bring the gears into mesh.

7. In a timing device, a timing mechanism, an alarm mechanism, an alarm trip controlling shaft adapted to be rotated by the timing mechanism, axially alined notched discs arranged to be rotated by the controlling shaft at different speeds, and an alarm trip provided with teeth adapted to enter the notches in the discs to release said alarm mechanism.

8. In a timing device, a timing mecha-

nism, an alarm mechanism, an alarm trip controlling shaft adapted to be rotated by the timing mechanism, a notched disc secured to the controlling shaft, a second notched disc geared to said controlling shaft and arranged to be rotated at a different speed than said first notched disc, an alarm trip mechanism adapted to simultaneously enter the notches in both discs to trip the alarm mechanism, and means independent of the timing mechanism for rotating said control shaft.

9. In a timing device, a timing mechanism, an alarm mechanism, an alarm trip controlling shaft adapted to be rotated by the timing mechanism, a notched disc secured to the controlling shaft, a second notched disc geared to said controlling shaft and arranged to be rotated at a different speed than said first notched disc, an alarm trip mechanism adapted to simultaneously enter the notches in both discs to trip the alarm mechanism, a setting knob geared to said control shaft, an indicator secured to said setting knob and a dial over which said indicator moves.

10. In a timing device, a timing mechanism, an alarm mechanism, an alarm trip controlling shaft adapted to be rotated by the timing mechanism, a notched disc secured to the controlling shaft, a second notched disc geared to said controlling shaft and arranged to be rotated at a different speed than said first notched disc, an alarm trip mechanism adapted to simultaneously enter the notches in both discs to trip the alarm mechanism, a setting knob geared to said first disc, a dial secured to the second disc, an apertured dial disposed in front of said first dial and through the aperture in which the first dial is visible, and an indicator secured to the knob and movable over said second dial.

11. In a timing device, a time shaft, a gear on said shaft, an alarm mechanism, a spring for driving said mechanism, a shaft to which said spring is attached, an alarm trip controlling shaft, a sleeve splined to said control shaft, a gear on said sleeve normally out of engagement with the gear on the time shaft, a lever engaging said sleeve, a Geneva gear, a pin on said gear engaging in the end of said lever, and a gear on the alarm spring shaft arranged to engage said Geneva gear to move said lever.

12. In a timing device, a timing mechanism, an alarm mechanism, a spring for driving the alarm mechanism, an alarm control, an alarm time indicating hand, means for driving the alarm time indicating hand in unison with the timing mechanism, and means operative by the winding of the alarm spring to automatically form said driving connection before the alarm is given, and for automatically disconnecting said driving connection when the alarm has been sounded.

13. In a timing device, a timing mechanism, an alarm mechanism, a spring for driving the alarm mechanism, an alarm control, an alarm time indicating hand, means for driving the alarm time indicating hand in unison with the timing mechanism, means operative by the winding of the alarm spring to automatically form said driving connection before the alarm is given and for automatically disconnecting said driving connection when the alarm has been sounded, an alarm trip controlling mechanism, and means actuated by the alarm time indicator hand for releasing said trip controlling mechanism.

14. In a timing device of the character described, a time dial, an indicator hand therefor, a driving mechanism for said indicator, an alarm set dial, an indicating hand therefor, an alarm mechanism cooperating therewith, spring actuated means for driving said alarm, means for winding said spring, means forming an automatic coupling between the time indicator and the alarm time indicator to drive the same in unison, and means actuated by the alarm winding mechanism for automatically connecting the coupling during winding of the spring and operative by the unwinding of the alarm spring for disconnecting said coupling.

In testimony whereof, we have hereunto set our hands at San Francisco, California, this 9th day of March, 1921, and 8th day of October, 1919, respectively.

PAUL S. LUTTRELL.
PAUL C. ROSKE.