E. E. GAGE.

CLOCK.

APPLICATION FILED DEC. 2, 1908.

937,232. **Patented Oct. 19, 1909.**

2 SHEETS—SHEET 1.

Fig. 1.

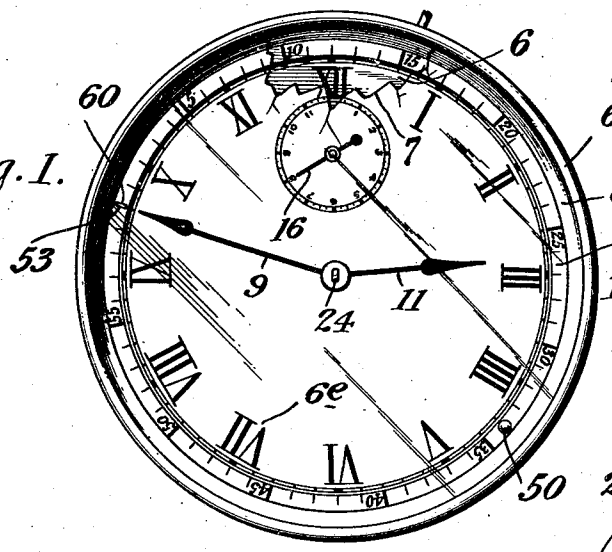


Fig. 4.

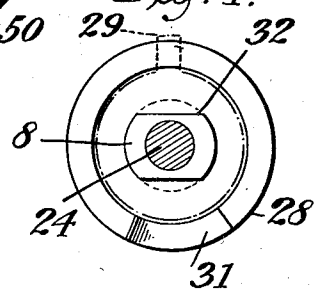
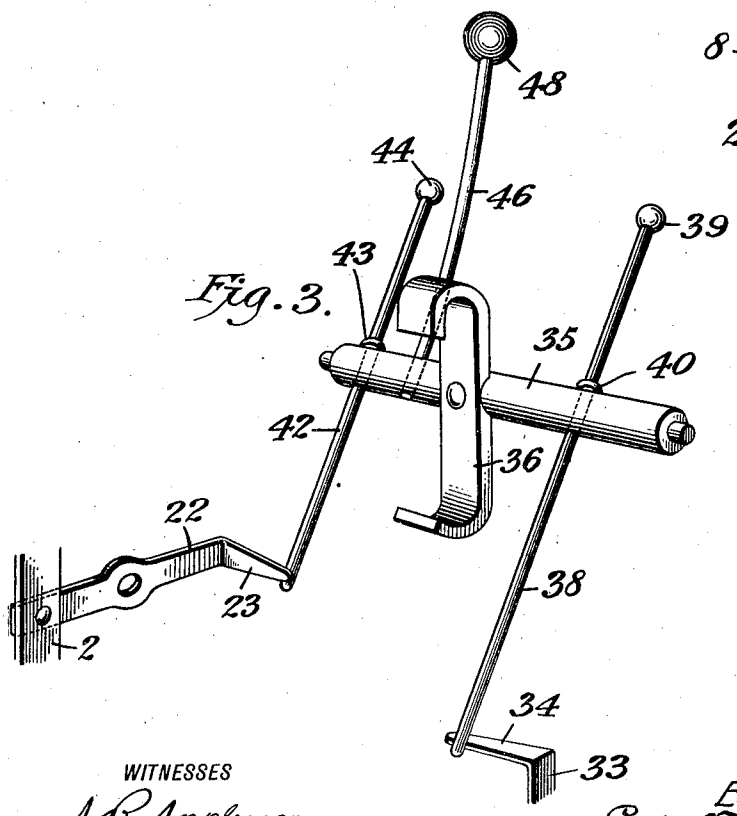


Fig. 3.



WITNESSES

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BY Edgar Tate & Co.

ATTORNEYS.

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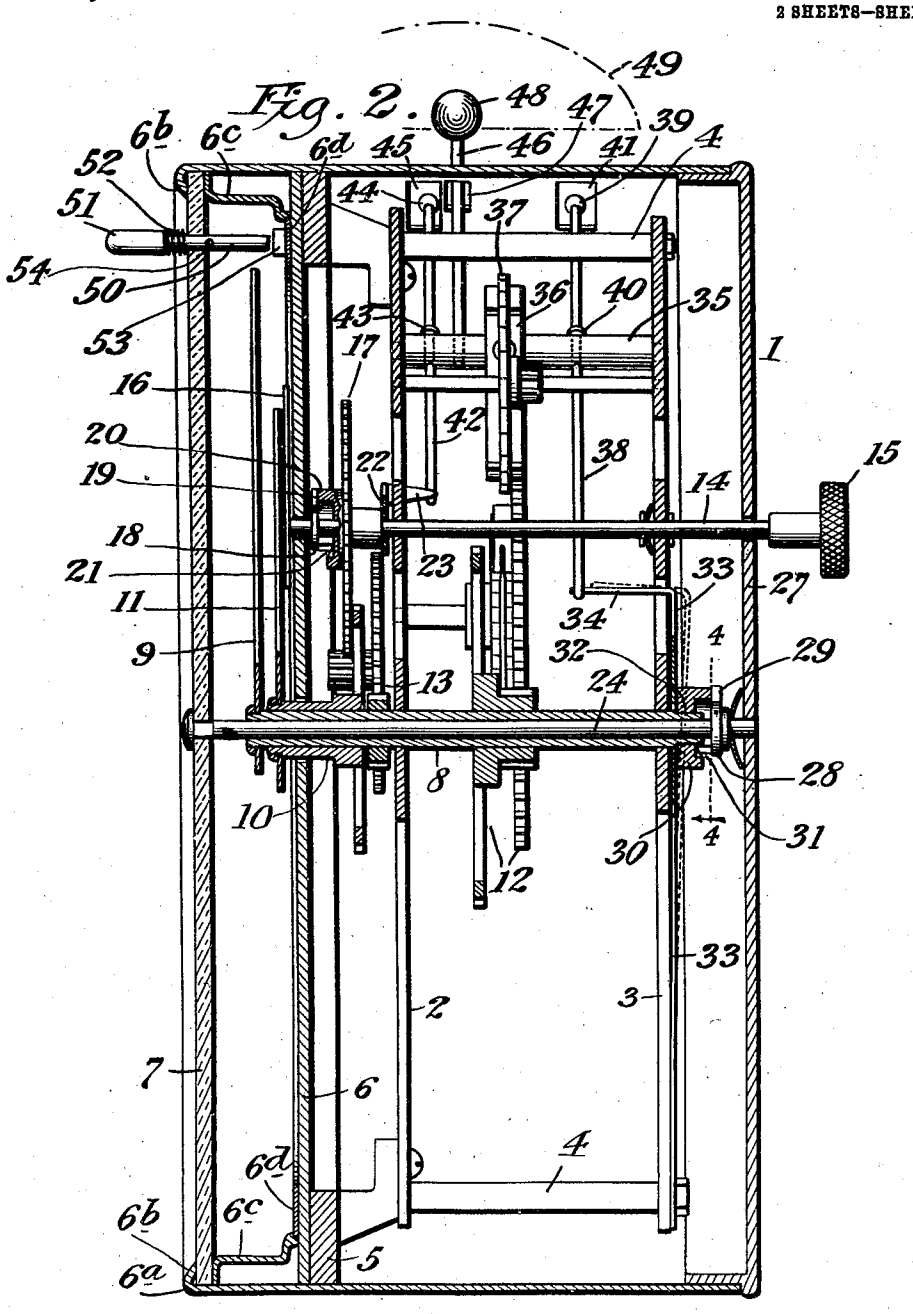
2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

EDWARD E. GAGE, OF NEW YORK, N. Y.

CLOCK.

937,232. Specification of Letters Patent. Patented Oct. 19, 1909.

Application filed December 2, 1908. Serial No. 465,699.

To all whom it may concern:

Be it known that I, EDWARD E. GAGE, a citizen of the United States, and residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Clocks, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to clocks and particularly to alarm clocks; and the object thereof is to produce an alarm clock of simple construction having the ordinary alarm attachment, and having in addition thereto a special alarm attachment which will enable the alarm to be rung very exactly at a predetermined time.

The invention also involves a construction which enables either the ordinary alarm, or the special alarm to be thrown into operation whenever desired, and the invention is particularly useful in many connections where an alarm is to be given after the expiration of a short time or under certain circumstances where it is necessary for the alarm to be sounded exactly at the expiration of a predetermined time or for which the alarm is set, and the said invention also involves a construction by which periods of time necessary to perform a certain operation may be computed or determined at a glance.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which;—

Figure 1 is a front view of a clock provided with my improvement, part of the front glass being broken away, Fig. 2 a central transverse vertical sectional view of my improved clock and showing the same on an enlarged scale, Fig. 3 a perspective view showing a portion of the mechanism which enables either of the alarm attachments to be thrown into operation and on an enlarged scale, and;—Fig. 4 a section on the line 4—4 of Fig. 2 and on an enlarged scale.

Referring to the drawing, 1 represents a clock case which is shown as circular in form, but which may be of any suitable or desired shape and in which is mounted a frame comprising frame plates 2 and 3 connected by studs 4, any desired number of which may be employed, and said frame is attached to a ring 5 secured in the case near the forward portion or front of the clock. Upon or to this ring 5 a dial or clock face 6 is secured, and in front of the dial or clock face there is placed the usual crystal or glass front 7 through which the dial or face of the clock may be seen.

The case of the clock is projected forwardly of the face or dial 6, and the crystal or glass 7 is rotatably mounted in an annular keeper 6^a formed by a flange 6^b on the front edge of the case, and an inner annular member 6^c placed within the case and between the parts 6 and 7, and placed on the outer or front side of the dial or face plate 6 is a flat rotatable ring 6^d.

The usual hour signs 6^e are placed on the dial or face plate 6 within the ring 6^d, and said ring is provided with scale marks and numerals representing the minutes of an hour; the numerals beginning with five and increasing by five from left to right to sixty.

Centrally disposed within the clock and passing through the frame plates 2 and 3 is a tubular arbor 8 which carries the minute hand 9 of the clock, and this arbor projects through the face dial or plate 6 of the clock as shown in Fig. 2.

Mounted on the front end portion of this arbor 8 is an hour sleeve 10 which passes loosely through the dial or face plate 6 and which carries the hour hand 11 of the clock, and this arbor 8 and the sleeve 10 are driven through a suitable time train, portions of which are indicated at 12 and 13, the arrangement being such that the minute hand travels at the usual speed ratio with respect to the hour hand.

At the usual point in the clock case there is mounted a main alarm setting arbor 14 such as is usually found in ordinary alarm clocks, the said arbor projecting at the back of the clock where it is provided with a thumb and finger head 15.

The forward extremity of the arbor 14 extends through the face of the clock and carries a setting hand 16, and loosely mounted on the main setting arbor 14 is the usual time wheel 17 which is driven from the time train 13 so that the wheel 17 makes one revolution in twelve hours; in other words the time wheel rotates synchronously with the hour hand of the clock. Just at the rear of the clock face or dial plate 6 the main arbor 14 is provided with a collar 18 having a pro-

jecting dog 19 which runs upon the rim of a ring cam 20, which cam is provided in its edge with a notch or recess 21 which the dog 19 is adapted to enter in the usual manner. The ring cam 20 is carried by the time wheel 17, and said time wheel and ring cam are slidably mounted on the main arbor 14.

Arranged against and transversely of the inner face of the hub of the time wheel 17 is a releasing arm 22 which is of resilient material and tends to press the time wheel and the cam 20 against the collar 18. This releasing arm may be considered as the main releasing arm for the alarm, and it may be attached to the forward frame plate 2 as shown in Fig. 3.

The arbor 14 passes through the releasing arm 22, and said arm is provided at its free extremity with a laterally projecting finger 23 which affords means for controlling the releasing of the alarm in a manner which will be described more fully hereinafter. The mechanism just described is such as is commonly found in the construction of ordinary alarm clocks. It should be understood, however, that with a construction such as this for releasing the alarm, a very small degree of accuracy can be attained in setting the alarm to ring at an appointed time; this follows largely from the fact that the time wheel 17 which coöperates with the collar 18 makes only one revolution in twelve hours, and the mechanism just described will be referred to hereinafter as the hour setting mechanism for the alarm.

The mechanism about to be described affords means for setting the alarm to ring accurately at the expiration of a predetermined period, say of one, five, ten, fifteen or any other number of minutes. This latter mechanism comprises a setting stem 24 which passes through the tubular arbor 8 projecting at both ends thereof, the front end thereof, in the construction shown, also extending through the crystal or glass 7, and the rear end thereof extending through the back 27 of the case. That part of the stem 24 which passes through the crystal or glass 7 is angular in form, and the aperture in said glass is similarly formed so that the stem 24 may be rotated by turning said crystal or glass.

Near the rear extremity of the stem 24 which is rotatably mounted in the back 27 of the clock case, said stem is provided with a collar 28, which collar is provided with a laterally projecting dog 29, and it should be understood that this collar 28 is similar in construction to the collar 18 hereinbefore described.

Mounted on the rear end extremity of the tubular arbor 8 which carries the minute hand of the clock is a ring cam 30 which is similar in construction to the cam 20, and said cam 30 is provided with a backwardly projecting rim having a notch or recess 31 formed at a suitable point therein, and the dog 29 is adapted to enter this recess when the alarm is to be released.

It will be understood that the cam 30 is fixed against rotation on the arbor 8, the reduced extremity of said arbor upon which the cam seats being preferably of the form shown in Fig. 4 so as to present flat faces 32 which force the cam to rotate when the arbor rotates. At the same time it should be understood that the cam 30 may slide longitudinally upon the arbor 8 in a rearward direction from the position in which it is illustrated in Fig. 2; that is, toward the collar 28.

Lying against the inner face of the cam 30 is a releasing arm 33 which is substantially similar in construction and mode of operation to the releasing arm 22 hereinbefore described. This arm 33 is of resilient material and tends to force the cam 30 in the direction of the collar 28, and said arm may be attached in any suitable manner to the rear plate 3 of the frame.

The upper extremity of the releasing arm 33 is bent inwardly to form a releasing finger 34, and this finger 34 controls the releasing of the special alarm; that is it controls the releasing of the arm when the time for the ringing is indicated by the position of the pin 50 on the ring 6^a. In this connection it should be understood that as the minute arbor 8 rotates when the minute hand carried thereby lies under the point of the pin 50, the notch 31 of the cam 30 will have reached the position of the dog 29 so that the dog will drop into said notch, and the releasing arm 33 will be thrown over into substantially the position in which it is shown in dotted lines in Fig. 2, and this movement operates to release the alarm in a manner which will appear more fully hereinafter.

I also provide as shown in Figs. 2 and 3 a verge shaft 35, the extremities whereof are rotatably mounted in the frame plates 2 and 3, and this arbor has rigidly attached thereto a verge 36 which may be of common form, which verge coöperates with a verge wheel 37. The verge wheel 37 is driven by a suitable spring drum device and gearing in the usual manner, said parts being not shown for the reason that they form no part of this invention.

Passing through the verge shaft 35 near one end thereof is a trigger pin 38 which ranges downwardly and upwardly and the lower end of which is adapted to operate in connection with the finger 34 of the releasing arm 33. and the upper end of which is provided with a knob or head 39, and the central portion of which is provided with a collar or shoulder 40, and said trigger or pin is movable through the shaft 35 and the

collar 40 prevents the same from passing downwardly through said shaft beyond a predetermined point.

The top portion of the clock case is provided with an aperture 41 which may have a door if desired, and through which the trigger pin 38 may be operated or removed and inserted whenever desired. Another trigger pin 42 passes through the opposite end portion of the verge shaft 35 and is movable therethrough and the lower end portion thereof is adapted to operate in connection with the finger 23 of the releasing arm 22, and said trigger pin 42 is also provided with a collar 43 and the upper end thereof with a knob or head 44, and the top portion of the clock case is provided with an aperture 45 through which said trigger pin may be operated or inserted and removed whenever desired. The verge shaft 35 is also provided with a hammer arm 46 which is rigidly connected therewith adjacent to the trigger pin 42, and said hammer arm passes out through an aperture 47 in the top portion of the case and is provided with a hammer 48, and said hammer and hammer arm are adapted to operate in connection with the usual bell or gong 49.

The trigger pin 42 is designed to control the hour alarm devices, and the trigger pin 38 is designed to control the minute or supplemental alarm devices as hereinafter described.

Mounted in and movable through the glass 7 is a pin 50 provided at its outer end with an enlarged head 51 forming a handle, and between which and the glass 7 is a spiral spring 52, and said pin is adapted to engage a stop 53 on the rotatable ring 6^d, and said pin 50 is also provided with a stop pin 54 to limit the outward movement thereof.

With this description and the accompanying drawings, the operation will be readily understood in view of the following statement thereof.

In practice, in order to set the alarm for minutes, the hour alarm trigger 42 is removed, and the rotatable glass front 7 is turned to the left by the pin 50. In this operation by pressing the pin 50 inwardly it will engage the lug 53 which is over the 60 mark on the ring 6^d. The glass 7 and ring 6^d may then be turned till the 60 or zero mark is directly under the minute hand as shown in Fig. 1. By releasing the pressure on the pin 50 it will move outwardly and disengage the lug 53 on the ring 6^d, and if it is desired to set the alarm for 34 minutes, the glass 7 is turned from right to left by means of the pin 50 till said pin is directly over the 34 mark on the rotatable ring 6^d, and the glass 7 with the pin 50 is left in this position as shown in Fig. 1.

In the above described operation the collar 30 will be turned by the minute arbor 8, and when the minute hand 9 is directly under the pin 50, the dog 29 on the collar 28 will drop into the cam recess of the collar 30 which will then be moved back longitudinally of said arbor by the spring 33, and the finger 34 will release the alarm trigger 38 and the alarm will be operated.

If it is desired to set the clock for hours and minutes, say for example, five hours and 34 minutes, both triggers 42 and 38 are placed in position as shown in Fig. 2. If the time be twelve minutes of three as shown in Fig. 1, set the alarm hand 16 for eight o'clock, then set the minute alarm as before for 34 minutes. When the time is eight o'clock the finger 23 on the spring 22 which is the hour alarm spring will be released from the hour alarm trigger 42, and when the minute hand has reached the pin 50 which is directly over the 34 minute mark on the ring 6^d the finger 34 of the spring arm 33 will be released and the alarm will ring exactly five hours and 34 minutes from the time it was set. In this way the various alarms may be operated at any desired time, or set to operate at any desired time, and it will be understood that the clock is provided with the ordinary alarm switch so that the alarm cannot sound at any time unless the switch is open, but this device forms no part of my invention and is therefore not shown and described.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent, is;—

1. In a clock, a stationary dial, a rotatable ring inclosing said dial and provided with a scale representing sixty minutes of time, a rotatable glass mounted in front of the dial, and means whereby the rotatable ring may be turned by said rotatable glass.

2. A clock provided with the usual dial plate, a rotatable glass placed in front of the dial plate, an alarm setting stem passing through the center of said glass and rotatable therewith.

3. A clock provided with the usual dial plate, a rotatable glass placed in front of the dial plate, an alarm setting stem passing through the center of said glass and rotatable therewith and through the main arbor of the clock.

4. In an alarm clock provided with minute and hour alarms, a spring releasing device for each of said alarms, a verge arbor provided with two triggers movable therethrough, one of which operates in connection with the spring releasing device of the minute alarm, and the other in connection with the spring releasing device of the hour alarm.

5. In a clock, a stationary dial, a rotatable ring inclosing said dial and provided with a scale representing sixty minutes of time, and a rotatable glass mounted in front of

the dial, means whereby the rotatable ring may be turned by said rotatable glass, and an alarm stem passing through the main arbor of the clock and through said rotatable glass and adapted to be turned by said glass.

6. The combination with the main center arbor of a clock of an alarm setting stem which is passed therethrough and in operative connection with the setting mechanism of the minute alarm.

7. The combination with the main center arbor of a clock of an alarm setting stem passing therethrough, and means for operating said stem from the front of the clock.

In testimony that I claim the foregoing as my invention I have signed my name in presence of the subscribing witnesses this 1st day of December 1908.

EDWARD E. GAGE.

Witnesses:
A. R. APPLEMAN,
C. E. MULREANY.