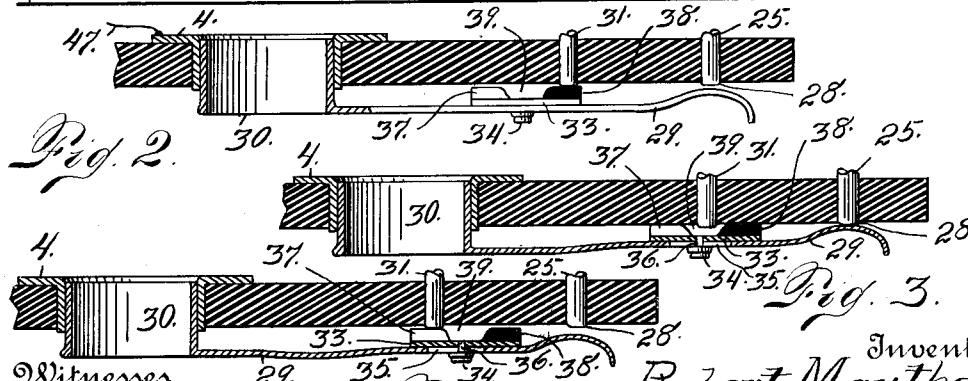
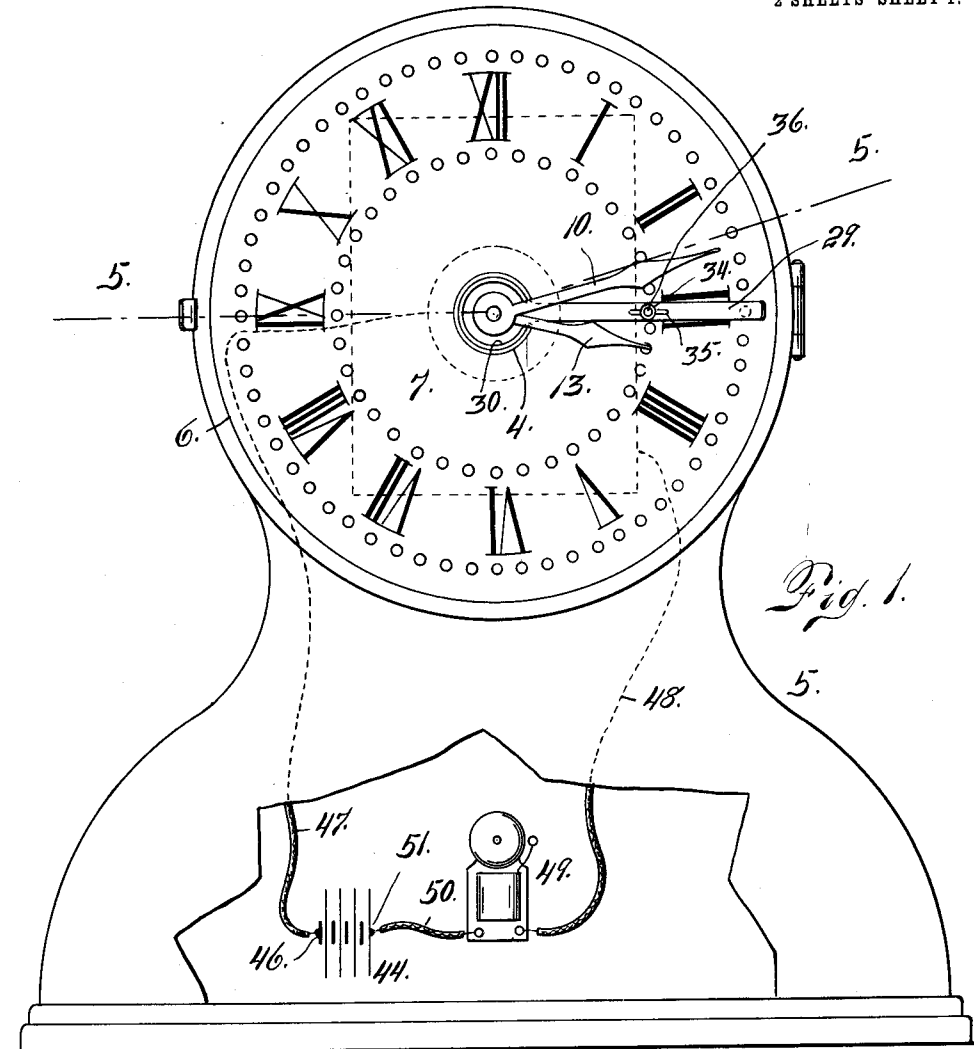


R. MAUTHE.
ELECTRICALLY OPERATED ALARM CLOCK.
APPLICATION FILED DEC. 18, 1911.

1,048,987.

Patented Dec. 31, 1912.

2 SHEETS—SHEET 1.



Witnesses
Otto E. Hoddick.
C. H. Rossmeyer.

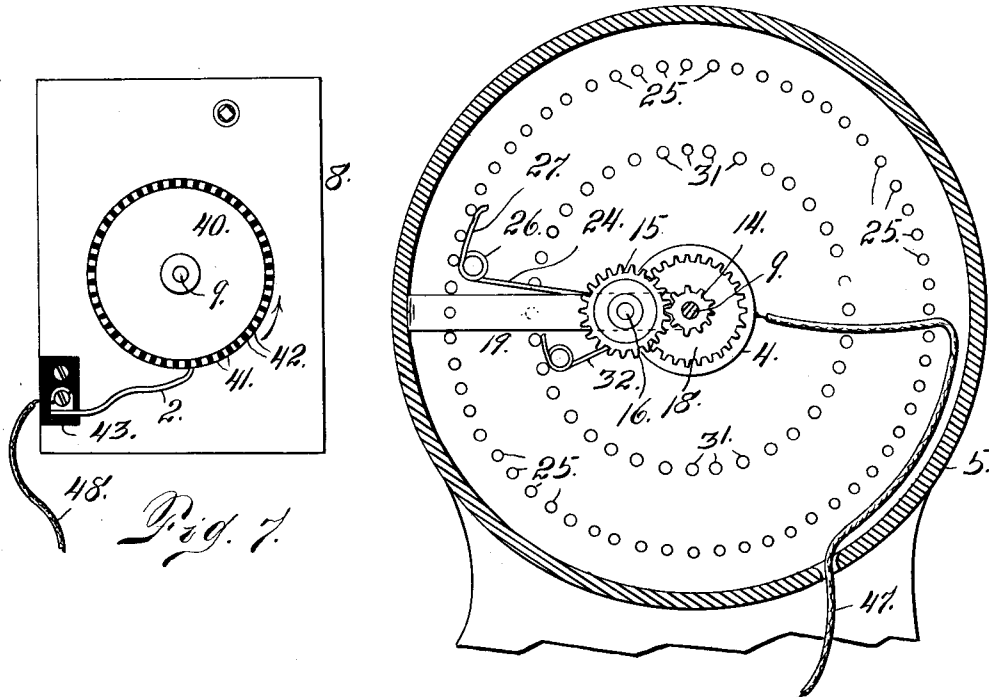
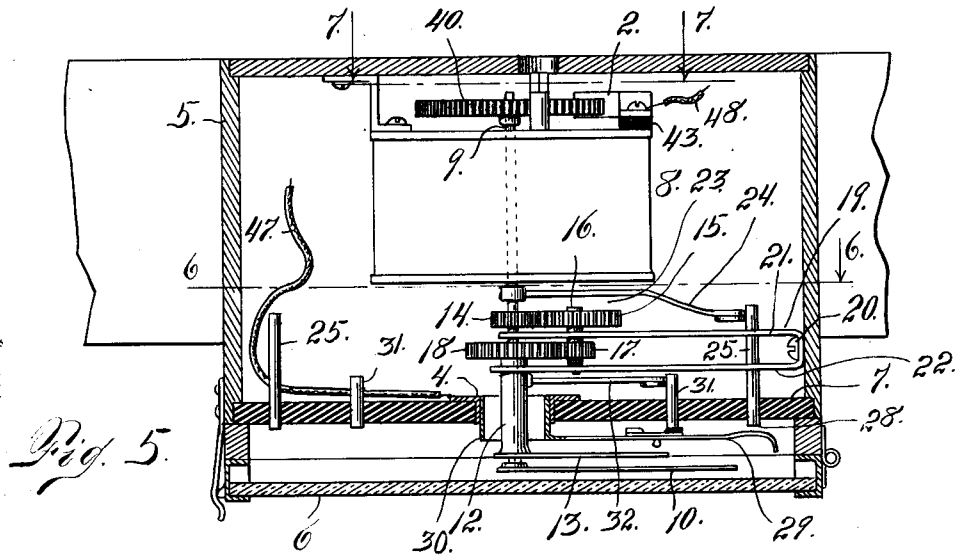
Robert Mauthe
By *A. J. O'Brien*
Attorney

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Otto E. Hoddick.
C. H. Rossmeyer.

Inventor
Robert Mauthe.
By *N. J. C. Smith* Attorney

UNITED STATES PATENT OFFICE.

ROBERT MAUTHE, OF DENVER, COLORADO.

ELECTRICALLY-OPERATED ALARM-CLOCK

1,048,987.

Specification of Letters Patent.

Patented Dec. 31, 1912.

Application filed December 18, 1911. Serial No. 666,498.

To all whom it may concern:

Be it known that I, ROBERT MAUTHE, a subject of Germany, but having declared my intention to become a citizen of the United States, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Electrically-Operated Alarm-Clocks; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in alarm clocks operated by electricity, and so constructed and arranged that the alarm may automatically be given at any time and at any desired intervals, provision being made for closing the circuit through a bell, through the instrumentality of the mechanism which directly operates the hour hand or the minute hand of the clock. For instance, if it is desired to sound an alarm at intervals of a number of hours, a contact is so adjusted that the circuit is closed through the medium of the hour-hand-operating mechanism; while if it is desired to sound the alarm at intervals of time less than an hour, the same contact is adjusted in such a manner as to close the circuit through the medium of the minute-hand-operating mechanism. This adjustment of the contact for closing the circuit may be readily accomplished, since the said contact is accessible on the dial of the clock. Provision is also made, whereby the current may be interrupted at relatively short intervals during the time that the electrical contact is made at another part of the circuit.

Having briefly outlined my improved construction, I will proceed to describe the same in detail, reference being made to the accompanying drawing, in which is illustrated an embodiment thereof.

In this drawing: Figure 1 is a front view of a clock, the frame work of which is partly broken away to disclose the electrical source, and bell or alarm device. Fig. 2 is a fragmentary section taken through the dial of the clock, being the same as a portion of Fig. 5, but shown on a larger scale. Fig. 3 is a similar

section showing the adjustable circuit-closing contact in a different position. Fig. 4 is a similar view showing the said contact in a third position. Fig. 5 is a section taken on the line 5—5, Fig. 1. Fig. 6 is a section taken on the line 6—6, Fig. 5. Fig. 7 is a section taken on the line 7—7, Fig. 5.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate the clock casing; 6 the door; and 7 the dial, which is of insulating material. Within this casing is located the body portion of the clock mechanism, which I will designate in its entirety by the numeral 8. Forming a part of this mechanism, and passing there-through, is a spindle 9, which carries the minute hand 10, the said spindle passing through a hollow spindle 12, carrying the hour hand 13. Upon the spindle 9 is a gear 14 meshing with a larger gear 15, fast on a spindle 16, carrying a smaller gear 17, meshing with a larger gear 18 fast on the hollow spindle 12.

The relative size of the gears 14, 15, 17 and 18, is such that every time the gear 18 is rotated, the gears 15 and 17 are rotated four-times, and during the four rotations of the gear 15, the gear 14 is rotated 12 times. Through the instrumentality of these gears, motion is imparted to the hour hand and the minute hand, 13 and 10, respectively, since the gear carried by the spindle 9 makes 12 rotations for every single rotation of the gear on the hollow spindle 12, carrying the hour hand as heretofore stated.

The details of the construction of the portion of the clock mechanism designated 8, will not be described, since nothing is claimed thereon. It has been necessary to describe the gears heretofore specified, since the position of these gears in the clock construction has been changed in order to make room for elements which will now be described.

A sort of bracket 19, which is U-shaped, is secured to the casing 5 by a screw 20. This bracket has two parallel arms 21 and 22. In the arm 21, the spindles 9 and 16 are journaled; while in the arm 22, the spindles 12 and 16 are journaled. By removing the gears 12 to 14 inclusive of the clock mechanism from their normal position, the space 23 is left, within which a contact arm 24, secured to the spindle 9, may travel, making complete rotations with the said spindle.

The outer extremity of this contact arm 24 is shaped to engage a metal contact pin 25, mounted in the bracket 19 and maintained in contact therewith for a suitable period, depending upon the time it is desired to prolong the alarm after the circuit is closed. As illustrated in the drawing, a coil 26 is formed at the outer end of this contact arm and beyond the coil a part 27 is bent at approximately right angles to the body of the arm, and arranged to engage the pin for the reason heretofore stated. This pin, in addition to being supported by the bracket 19, passes through the dial 7 of the clock, and extends slightly forward of the face thereof, its forward extremity being exposed as shown at 28, whereby it is in position to be engaged by a contact arm 29, exposed in front of the face of the dial; the arm 29 being rotatably adjustable, its inner extremity being secured to a sleeve 30, journaled in the center of the dial and surrounding the hollow spindle 12. The dial is provided with a metal bushing 4, forming a bearing for the said sleeve. There is a series of contact pins 25 whose forward extremities are exposed on the face of the clock in the same manner as just explained with reference to the pin 25 which is mounted in the bracket 19. As illustrated in the drawing, there are sixty of these pins, and they are arranged near the outer periphery of the dial of the clock, just beyond the hour designations and correspond in position with the minute marks on the face of an ordinary clock. Hence, when the contact arm 29 is adjusted to engage the pins 25 on the face of the clock dial, provision may be made for closing the circuit at any desired intervals, less than an hour apart. Similar pins 31 are mounted in the dial 7 of the clock, and extend both inwardly and outwardly therefrom, their inner extremities being arranged to be engaged by a contact arm 32, carried by the hollow spindle 12, while their outer extremities are in position to be engaged by a contact 33, slidably mounted on the arm 29. This arm 29 is provided with a slot 35, through which passes a pin 36, carrying a button 34 exposed on the forward surface of the arm 29, and therefore accessible for purposes of adjustment. The opposite extremities of the contact 33 are provided with inwardly extending lugs 37 and 38, respectively, leaving a space 39 between the two lugs. The lug 37 is composed of metal or other suitable conducting material, the same as the body of the arm; while the lug 38 is composed of insulating material.

When it is desired to allow the arm 29 to engage any contact pin 25, the contact 33 is so adjusted that the extremities of the pins 31 will occupy a position in the space 39, so there will be no engagement between the pins 31 and the arm 29.

Again, when it is not desired that the arm 29 shall engage either the pins 25 or the pins 31, the contact 33 is adjusted to bring the insulating lug 38 into engagement with one of the pins 31. This will separate the outer extremity of the arm 29 from pins 25, while the pins 31 or the particular pin, with which the arm 29 is in alignment, will be insulated from the said arm.

Again, if it is desired to place the arm 29 in electrical engagement with any one of the pins 31, the adjustable contact is moved to bring the lug 37 into the zone of the pins 31, for the purpose of closing the circuit through one of these pins, whenever the contact arm 32 has traveled a sufficient distance to bring it into engagement with the particular pin 31 where the arm 29 is located.

As illustrated in the drawing, there are 36 of these pins 31, but it is evident that any desired number, either greater or less than 36, that may be consistent with the size of the dial and the separation of the pins, may be employed. Where 36 pins are employed it is practicable to close the circuit and sound the alarm at twenty-minute intervals through the agency of the arm 32, carried by the hour hand spindle 12. At the rear extremity of the minute hand spindle 9, is located a wheel 40, whose periphery is equipped with a series of contact members 41, separated by insulating members 42. The periphery of this wheel, where the contacts 41 are exposed, engages a spring metal contact 2, forming a part of the electrical circuit, this contact being mounted on the body of the clock mechanism 8, and insulated from the metal parts, as shown at 43. By virtue of this wheel 40, the operation of the alarm bell may be interrupted a number of times during the alarm period, as determined by the engagement of the contact arms 24 and 32 with their respective pins 25 and 31.

As illustrated in the drawing, the wheel 40 consists of an ordinary gear wheel with the spaces between the teeth or cogs filled with insulating material.

Suitably located, and preferably concealed within the casing 5 of the clock, is a battery 44, from one pole 46 of which leads a conductor 47 to the metal bushing 4, in which the sleeve 30 is journaled. This sleeve 30 fits closely within the bushing 4, and therefore forms a good electrical contact therewith. In describing the path of the current, it may be said to pass from the pole 46 of the battery, through the conductor 47 to the bushing 4, thence, through the contact arm 29 to one of the pins 25 or 31, as the case may be. If it be assumed that the contact arm 29 is in engagement with the pin 25, the current may be said to pass from the arm 29, through the pin 25, to the contact arm 24, thence to the

spindle 9, the wheel 40, and from one of its contact members 41 to the contact 42, thence through a conductor 48, to an alarm bell 49, and thence from the said bell through a conductor 50, to the opposite pole 51 of the battery 44, completing the circuit.

Again, if it be assumed that the arm 29 is in electrical contact with a pin 31, the circuit will be completed from the arm 29 through the pin 31, the contact arm 32, the hollow spindle 12, the spindle 9, and thence to the pole 51 of the battery, by the same route as heretofore explained.

From the foregoing description, the use and operation of my improved electrically operated alarm clock will be readily understood.

If it is desired to set the clock, so that the alarm bell shall ring within a short period of time, the arm 29 should be adjusted to engage one of the outer pins 25 exposed on the face of the dial, as heretofore explained; and in order that this may be practicable, the contact 33 must be adjusted to bring the space 29 between the lugs 37 and 28 into the zone of the pins 31. In this event, the outer inwardly curved extremity of the arm 29, will be in position to engage any desired pin 25 (see Fig. 3). In determining the position of the arm 29, it must be considered that the contact 24 which travels with the spindle 9, is arranged in alinement, or so that its position shall be coincident with that of the minute hand 10. Hence the arm 29 may then be moved in the direction of the travel of the minute hand, to cause the circuit to be closed within any desired number of minutes from the time that the adjustment is made, since the number of pins 25, is sixty, as illustrated in the drawing and heretofore explained. Hence, it will be understood from what has been explained, as soon as the contact arm 24 reaches the particular pin 25 with which the arm 29 is in engagement, the circuit will be closed, the current taking one of the routes heretofore explained, and the circuit will remain closed until the bent extremity 27 of the contact arm 24 leaves the particular pin 25 in question. This engagement of the extremity 27 of the arm 24 with the pin 25, may last while the wheel 40 is traveling far enough to break the circuit several times, by virtue of the interruptions 42 of the insulating material on the periphery of the said wheel.

Again, if it is desired to set the mechanism to sound the alarm for a longer period in advance than one hour, the adjustable contact 33 will be so arranged on the contact arm 29, that the lug 37 shall lie in the zone of the pins 31. Then by regulating the arm 29, with reference to the location of the hour hand, the mechanism may be set to sound an alarm any desired number of hours in advance of the time when the ad-

justment is made, and as soon as the contact arm 32, whose position is coincident with that of the hour hand, has reached the particular contact pin 31, where the arm 29 is located, the circuit will be closed through one of the routes heretofore explained, and the alarm will be sounded.

Having thus described my invention, what I claim is:

1. In an electrically operated alarm clock, the combination with clock mechanism, an alarm, a circuit in which the alarm is located, separated contacts located in the circuit, an arm adjustable to engage any one of said contacts, said arm being also located in the circuit, and a second arm located in the circuit, movable in harmony with one of the hands of the clock, occupying a predetermined position with reference to the said clock hand and adapted to engage the said separated contacts, whereby the circuit may be closed through the alarm when the movable contact arm engages the same separated contact with which the adjustable arm is in engagement, substantially as described.

2. In a clock of the class described, the combination with clock mechanism, an alarm, a circuit in which the alarm is located, two sets of contact pins arranged in zones concentric with the axis of the clock hands, contact arms moving in harmony with the hour and minute hands respectively, of the clock and adapted to engage the respective sets of contact pins, and a third contact arm located in the circuit and adjustable to engage any pin of either set of contact pins, substantially as described.

3. In a device of the class described, the combination with clock mechanism, an alarm, a circuit in which the alarm is located, two sets of contacts located in the circuit, a radial, exposed arm adjustable in proximity to both sets of contacts, a contact adjustable on said radial arm to place the arm in electrical contact with either of the said sets of contacts, and other contact arms also located in the circuit and movable in harmony with the hour and minute hands of the clock respectively, and adapted to respectively engage the said sets of contacts, for the purpose set forth.

4. In a device of the class described, the combination with clock mechanism, an alarm, a circuit in which the alarm is located, contact pins arranged in zones concentric with reference to the axis of the clock hands, contact arms located in the circuit and movable in harmony with the hour and minute hands of the clock respectively, the said contact arms being of different lengths, one set of contact pins being at the circumference of the circle described by the shorter contact arm, while the other set of contact pins is outside the said circle

and at the circumference of a circle described by the longer contact arm, and a third radial contact arm bodily adjustable and carrying a contact longitudinally adjustable thereon to place the radial arm in the circuit of either or neither set of contact pins, for the purpose set forth.

5. The combination with clock mechanism, an electric circuit, an alarm located in the circuit, two sets of contact pins arranged in different zones concentric with the axis of the clock hands, contact arms moving in harmony with the respective hands of the clock and adapted to respectively engage the said sets of contact pins when the clock is in operation, and a radial contact arm carrying an adjustable member, whereby the radial arm may be placed in the circuit—
with any pin of either set of contact pins, substantially as described.

6. The combination with clock mechanism, an electric circuit, an alarm located in the said circuit, a contact arm movable in harmony with one of the clock hands, a series of pins arranged in a zone concentric

with reference to the axis of the clock hands, and adapted to be engaged by the said contact arm during the travel of the latter, and a radial arm also located in the circuit and adjustable to engage any pin of the said set, for the purpose set forth.

7. The combination with clock mechanism, an electric circuit, an alarm located in said circuit, a contact arm movable in harmony with one of the clock hands, a set of contact pins arranged in the path of the said contact arm, whereby the latter will engage all of the pins of said set in making a complete revolution, a second arm adjustable to engage any pin of said set, the adjustable arm being also located within the circuit, and a device operated from the clock mechanism for intermittently breaking the alarm circuit, for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT MAUTHE.

Witnesses:

F. E. BOWEN,

A. EBERT O'BRIEN.