April 22, 1952 W. J. WARD 2,594,103

AUTOMATIC ELECTRIC TIME CONTROL

Filed Oct. 29, 1948 2 SHEETS—SHEET 1

Fig. 1.

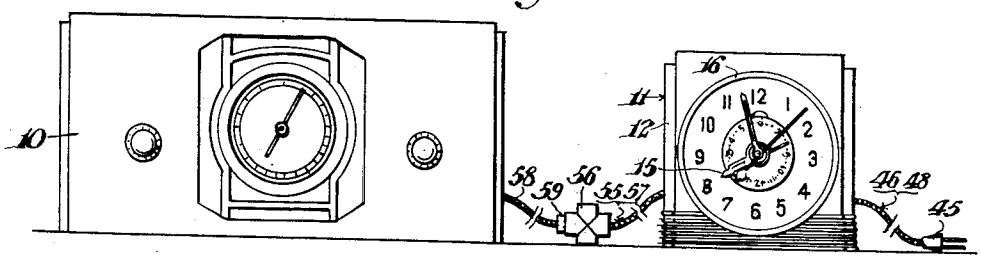


Fig. 2.

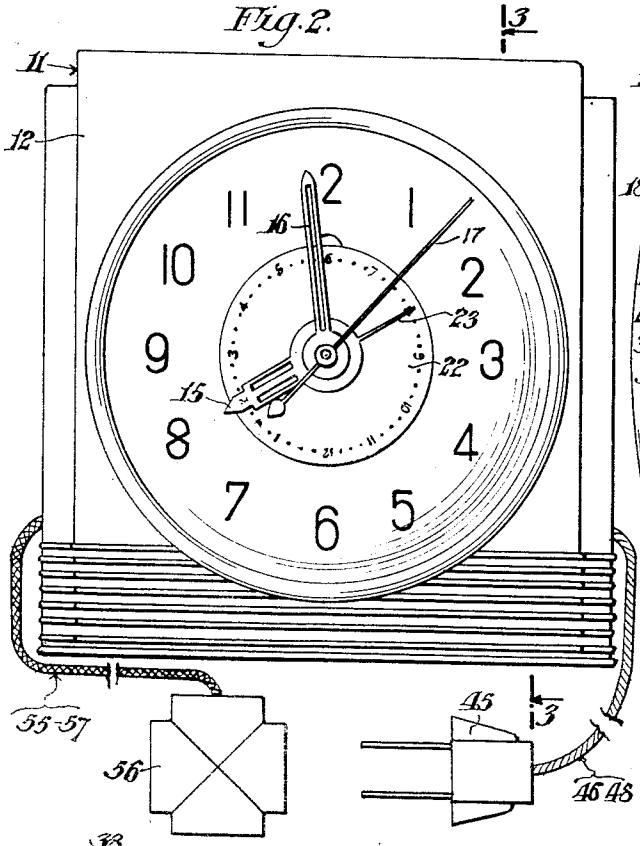


Fig. 3.

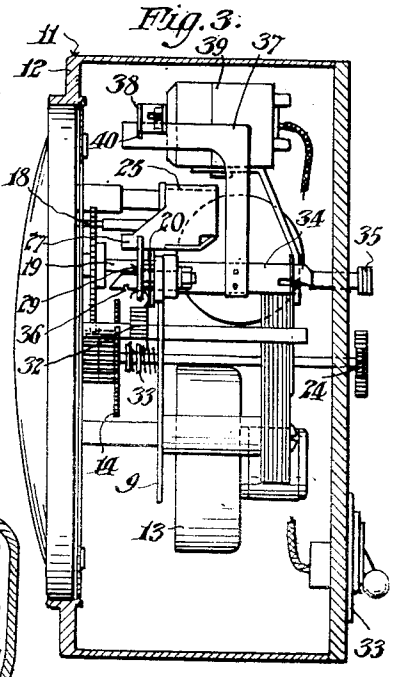
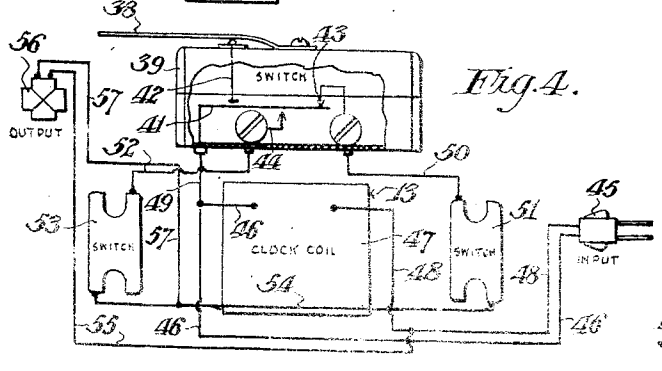


Fig. 4.



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Fig. 5.

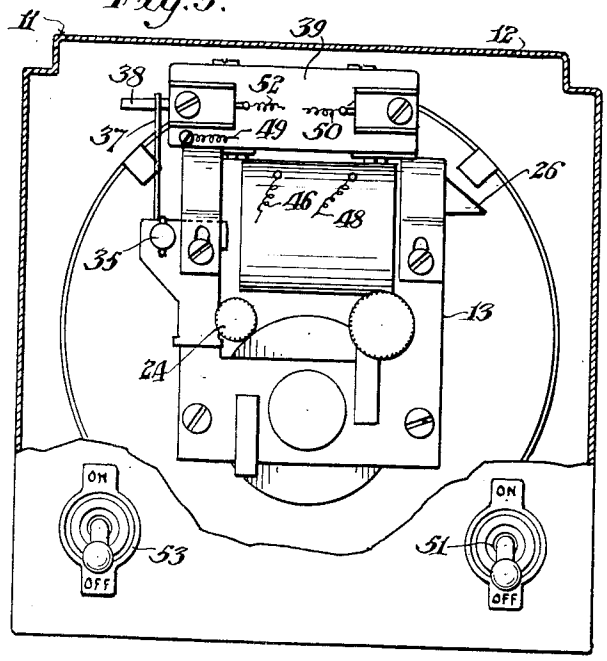
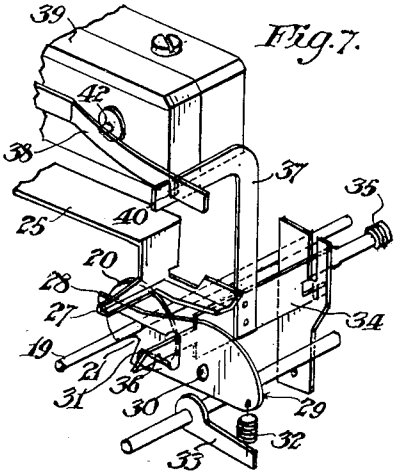


Fig. 7.



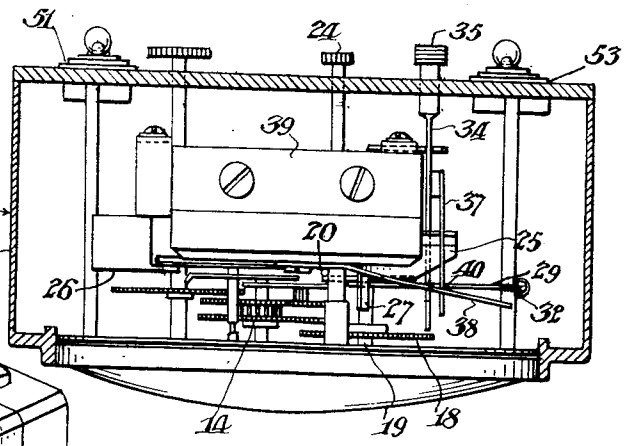


Fig. 6.

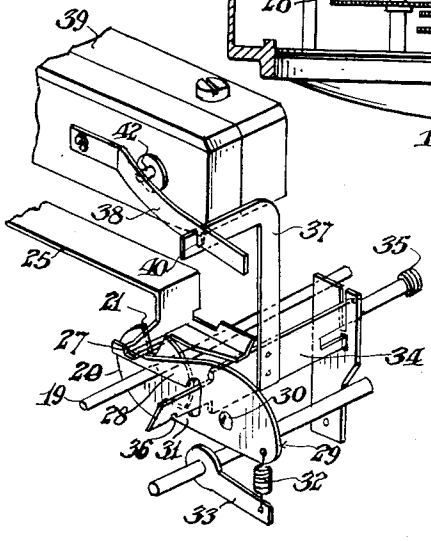


Fig. 8.

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AUTOMATIC ELECTRIC TIME CONTROL

William J. Ward, Philadelphia, Pa.

Application October 29, 1948, Serial No. 57,171

1 Claim. (Cl. 161—1)

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My invention relates to a new and useful automatic electric time control and has for one of its objects to combine electrical circuits, including a double throw switch and manually operated single throw switches, with an electrically operated clock mechanism for either turning on or off another electrically operated device, such as a radio receiver, for example.

Another object of this invention is to provide unique mechanism for regulating and setting time control mechanical parts and the double throw switch.

A further object of the present invention is to provide an exceedingly simple, compact and effective device of the character mentioned for either turning on or off electrically actuated apparatus at preselected times.

With the above and other objects in view this invention consists of the details of construction and combination of elements hereinafter set forth and then designated by the claim.

In order that those skilled in the art to which this invention appertains may understand how to make and use the same I will describe its construction in detail referring by numerals to the accompanying drawing forming a part hereof, in which:

Fig. 1 is a view of the automatic electric time control connected with a radio receiving set for either turning on or off the electric current which operates said set.

Fig. 2 is an enlarged face view of the time control device.

Fig. 3 is a section on the line 3—3 of Fig. 2, with the clock mechanism and the control regulating and setting mechanism in elevation.

Fig. 4 is a diagrammatic view of the electrical circuits and the operating parts of the double throw switch.

Fig. 5 is a rear view of the time control apparatus with a portion of the back wall of the case broken away to illustrate the relation of the manually operated single throw switches to the double throw switch and portions of the clock and regulating mechanisms.

Fig. 6 is a top plan view thereof with the case shown in section.

Fig. 7 is a fragmentary perspective view of the control regulating and setting mechanism and the double throw switch when the parts are in the set position.

Fig. 8 is a similar view after the regulating mechanism has operated to either open a formerly closed circuit or close a formerly open circuit, as the case may be.

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In carrying out the invention as herein embodied 10 represents an electrically operated device or apparatus to be either turned off or on at predetermined or preselected times and for convenience of illustration only, said device or apparatus is shown conventionally as a radio receiving set. Said device 10 is controlled by the automatic electric time control 11 including a casing 12 in which is enclosed the usual or any well known clock mechanism including the electrically driven prime mover or motor 13, the gear train 14 for actuating the hour and minute hands 15 and 16, respectively, as well as the second hand 17, if the latter hand is provided.

A suitable portion of the gear train 14 which actuates the time hands meshes with the gear 18 which, in an ordinary clock, is a part of the alarm setting and starting mechanism but in this device is a part of the main, primary or double throw switch control. Said gear 18 is fixed on a shaft 19 to which is also fixed a notched disc wheel 20 having a single notch 21 properly synchronized with the alarm or switch control time setting indicator comprising, in this instance, a dial 22 and a pointer 23, Fig. 2. The indicator is set by the operating stem 24 in a well known manner. After the indicator has been set the notched disc wheel 20 is rotated by the time mechanism through the medium of the gears.

A spring lever 25 is anchored at one end, at the location 26 in Fig. 6, and extends transversely of the clock with free end adjacent the notched disc wheel 20 and having a finger 27 that overlies said disc wheel and urged towards the latter so as to ride on the perimeter of said disc wheel and to enter the notch 21 when said notch is moved into alignment with the finger 27.

Said finger 27 is long enough to extend beyond the notched disc wheel 20 and contact the top of the arm 28 forming a part of a bifurcated lever 29 pivoted intermediate its ends, as at 30, to a suitable part of the frame 9 of the clock mechanism. The other portion of the bifurcated end of the lever 29 provides a short foot 31 parallel with and spaced from the arm 28. The arm and foot end of said lever 29 is urged upwardly towards the finger 27 by a spring 32 attached to the lever 29 on the side of the pivot 30 opposite to the arm and foot, and to a stationary element 33, which may be a projection on one of the posts.

A slide member 34 is mounted for longitudinal sliding movements in parts of the clock frame and the rear end projects through the back of the case where said slide member is provided with a finger piece 35 for easy manual operation.

The inner end of the slide member 34 projects through the space between the arm 28 and foot 31 and the inner extremity of said slide member is beveled or inclined outwardly from the upper edge to the lower edge which latter has a notch 36 near the inner end of the slide member. Under certain conditions, to be presently described, the foot 31 will enter the notch 36 in the slide member 34 to temporarily hold said slide member in a retracted position.

An inverted L-shaped arm 37 is secured to the slide member 34 and loosely connected with the spring lever 38 of the double throw switch 39. The free end of the spring lever 38, as herein shown, is constantly urged outwardly or away from the body of its switch or towards the front of the clock. A convenient way to connect the spring lever and the inverted L-shaped arm is to provide a notch 40 in an edge of the toe portion of said arm with which the spring lever 38 registers.

The spring lever is to actuate or permit actuation of the switch blade 41, Fig. 4, of the double throw switch 39 by means of a plunger 42 which is normally urged outward by said switch blade which is resilient or spring urged towards the contact point 43 and away from the contact point 44. The plunger 42 extends through the casing of the switch 39 so that its outer end can be engaged by the spring lever 38 for actuating the blade 41 in one direction. The retraction of the plunger 42 is accomplished by the action of the blade 41 on said plunger wherever a holding or propelling pressure is removed from the spring lever 38.

For purposes of illustration, there is shown a plug 45 as the input and for connection with any suitable source of electricity. One side or conductor 46 of the main source of supply leads from said plug 45 to one side of the prime mover or motor, specifically the coil 47, and the other side or conductor 48 of said source of supply leads from said plug to the other side of said prime mover or motor or coil 47 thereof. A branch conductor 49 leads from the conductor 46 to the spring actuated blade 41. Another branch conductor 50 leads from the contact point 43 of the switch 39 to one side of a manually operated single throw switch 51 and likewise a branch conductor 52 leads from the contact point 44 of said switch 39 to one side of a second manually operated single throw switch 53 and the opposite sides of said manually operated switches are connected by a conductor 54. A branch conductor 55 leads from the conductor 48 directly to the output 56 illustrated as a socket to which also leads a conductor 57 from the conductor 54 common to both of the manually operated single throw switches 51 and 53.

To the output 56 is connected any electrically operated apparatus 10, for example a radio, by the electric cord 58 and its plug 59.

In practice, assuming that all parts of the time control device are in some neutral position but the input 45 is connected to a source of electric supply so that the prime mover or motor is operating to actuate the hour and minute hands and associated elements, and the said time control device is electrically connected to another electrically operated device 10 to be controlled, such as a radio.

With both manually operated switches 51, 53 in the "off" positions, the current will flow through one side, as 46, of the main circuit to the prime mover 13, especially the coil 47,

through the latter and the other side, as 48, of the main circuit. This will cause the time mechanism to operate.

If it is desired that the radio or other controlled apparatus 10 is to be started and operated at a subsequent preselected time from that indicated by the hour and minute hands, the dial 22 and its pointer 23 are set to the desired time whenever necessary, similar to an ordinary alarm clock, and the manually operated single throw switch is moved to the "on" position. The setting of the dial and pointer moves the notch 21 in the disc wheel out of alignment with the finger 27 and raises said finger along with the spring lever 25 away from the bifurcated lever 29, particularly the arm portion 28 thereof. This permits the arm and foot end of said bifurcated lever 29 to be raised by the spring 32.

Next, the slide 34 is projected or pulled outwardly until the notch 36 in said slide 34 registers with the foot 31 when the foot will be moved into the notch 36 as shown in Fig. 7. The projecting of the slide 34 will move the inverted L-shaped lever 37 outward and draw the spring switch lever 38 rearwardly to propel the plunger 42 inward and move the blade out of engagement with the contact point 43.

When the notch 21 in the disc wheel 20 finally reaches the location of the finger 27 said finger will be projected into said notch 21 and force the arm and foot end of the bifurcated lever 29 downward thus withdrawing the foot 31 from the notch 36 in the slide, releasing the latter so that it may be retracted by the spring lever 38 through the medium of the inverted L-shaped arm 37. This action permits the blade 41 to move towards and into engagement with the contact point 43 thereby completing one side of a branch circuit through the conductors 46 and 49, thence through the blade 41, contact point 43, conductor 50, switch 54, and conductor 57 to the output or socket 56. The outer side of the same branch circuit being completed through the conductors 48 and 55 from the input to said output or socket 56. The apparatus 10 connected to the output will thus be supplied with electricity for operating said apparatus and, in the case of the radio receiving set, will turn on said receiving set at the preselected time. Immediately upon release of the slide 34 and its withdrawal from the foot 31 of the bifurcated lever 29 the latter will be actuated to lift the finger 27 out of the notch 21 in the disc wheel 20.

Now assuming that it is desired to operate the apparatus 10 and shut off the same at a preselected time. Then the pointer 23, notched wheel 20, slide 34, spring arm 38 and switch blade 41 are set as previously stated so that said blade 41 is out of engagement with contact point 43 and in engagement with contact point 44. By moving the manually operated switch 51 to the "off" position so there is no current flowing through the branch circuit last above described and moving the manually operated switch 53 to the "on" position a second branch circuit is completed. One side of the second branch circuit comprises the conductors 48 and 49 leading from the input 45, the switch blade 41, contacts 44, conductor 52, single throw switch 53, conductors 54 and 57 to the output 56. The same conductors 48 and 55 previously described form the other side of the second branch circuit from the input to the output. At the proper moment the switch blade 41 will be released to permit it to become disengaged from the contact point 41 thus opening the second

branch circuit and shutting off the apparatus at the preselected time.

From the foregoing it will be apparent that the construction of the time control device is such that the operation of the main double throw switch actuates either of two branch circuits in accordance with which secondary or manually operated single throw switch is moved to the "on" position for either closing one branch circuit or closing the other branch circuit at preselected but separate or independent times.

Of course I do not wish to be limited to the exact details of construction herein shown and described as these may be varied within the scope of the appended claim without departing from the spirit of the invention.

Having described my invention what I claim as new and useful is:

In an automatic time control apparatus comprising an electrically operated clock mechanism including a wheel having a notch in its perimeter and a prime mover for operating said clock mechanism, a double throw switch having two contact points and a spring actuated blade constantly urged towards one of said contact points, an output circuit, two branch circuits connected to said output circuit and each of said branch circuits connected to a separate one of the contact points of the double throw switch, a manually operated single throw switch interposed in each branch circuit, means spring actuated in one direction and connected to the blade of the double throw switch and manually projectable in the other direction to actuate said blade in one direction to move said blade into engagement with one contact point and out of engagement with the other of said contact points for connecting one branch circuit with the main circuit and simultaneously disconnecting the other branch circuit from said main circuit, means having a portion disposed beside the notched wheel to hold the manually operable means in a projected position, and means engaging the perimeter of said notched wheel adapted to drop into the notch when the latter aligns with said last named means and contact the holding means and actuate it to release the manually projectable means and thereby cause operation of the double throw switch for disconnecting the previously connected branch circuit and connecting the other branch circuit with said main circuit, the disconnecting of the connected branch circuit opening the latter if formerly closed by its respective manually operated switch and the connecting of the disconnected branch circuit closing the latter if formerly partially closed by its respective manually operated switch.

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