

May 14, 1940.

J. R. MOORE

2,201,048

TIMING MECHANISM

Filed July 19, 1938

2 Sheets-Sheet 1

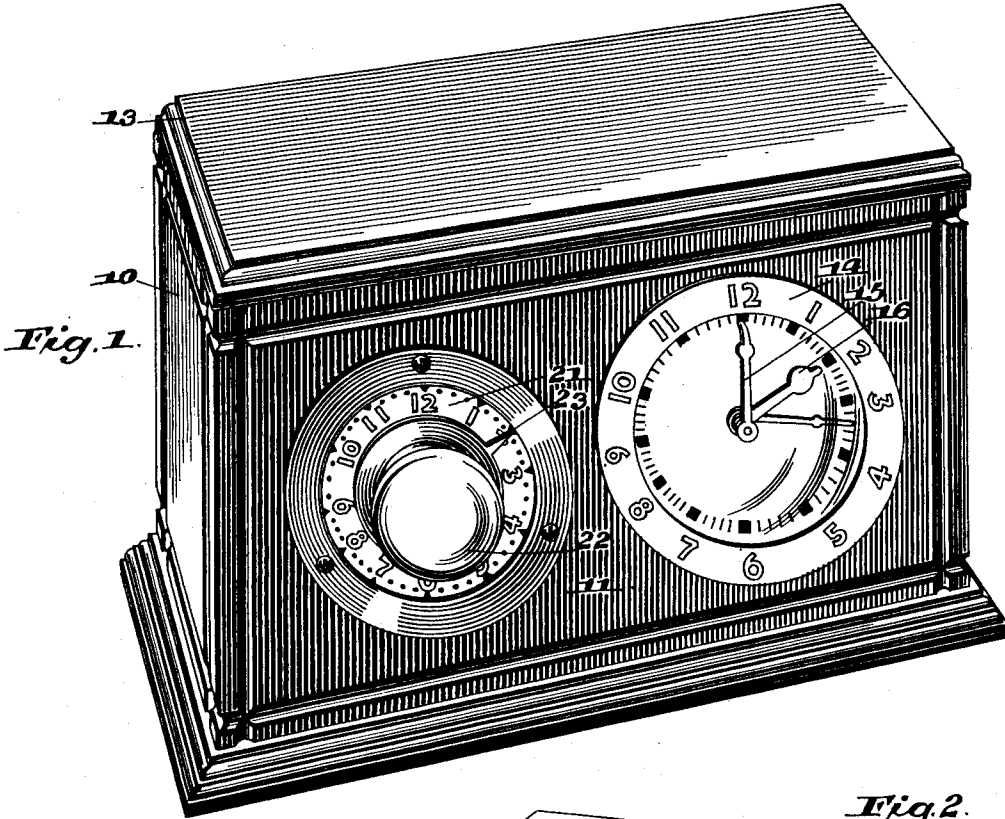


Fig. 1.

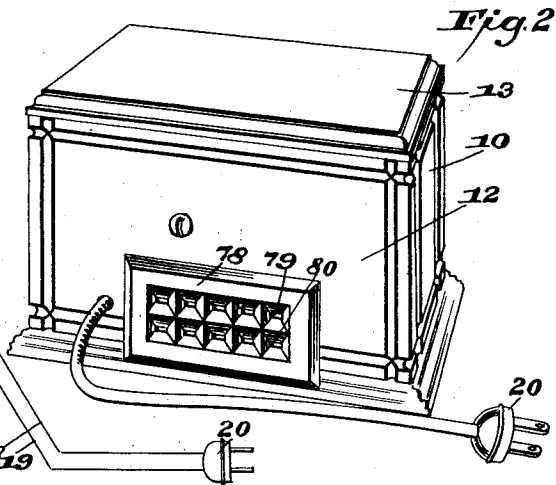
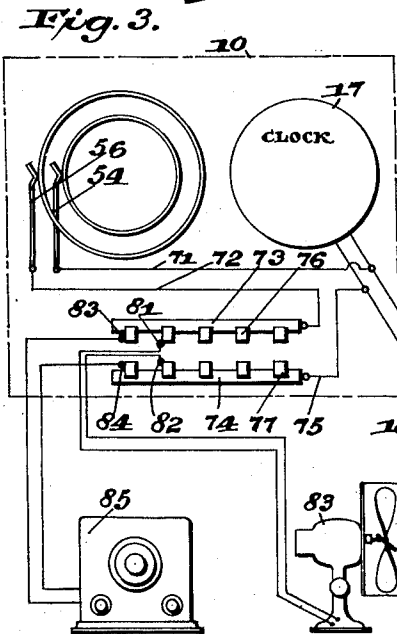


Fig. 2.

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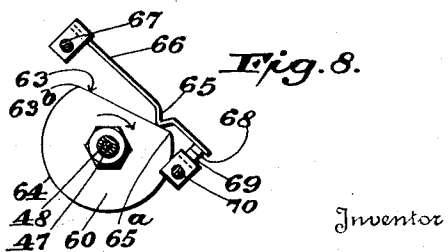
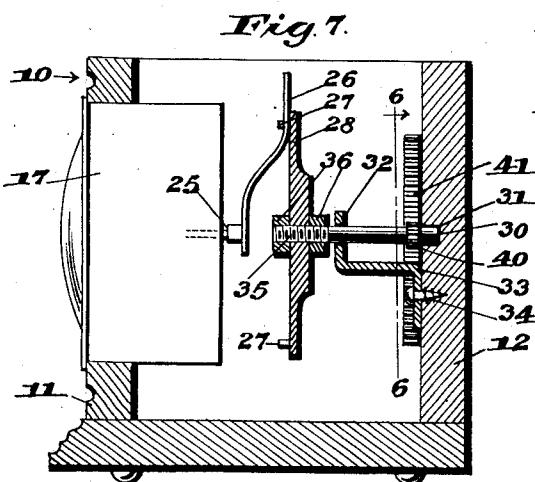
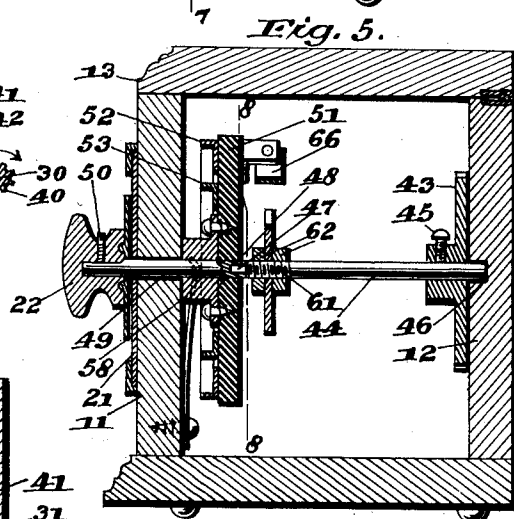
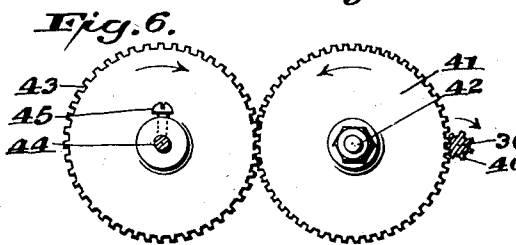
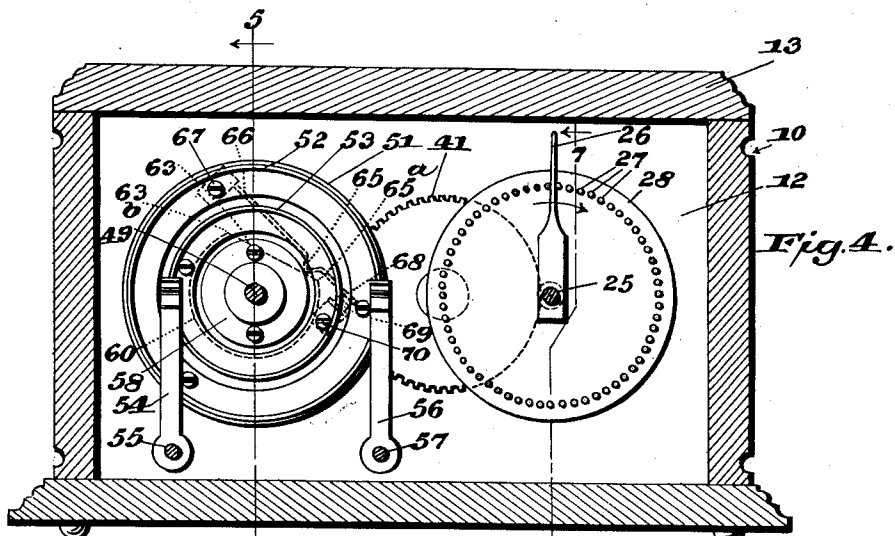
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TIMING MECHANISM

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Application July 19, 1938, Serial No. 220,156

3 Claims. (Cl. 200—3)

This invention relates to timing mechanisms for electrically operated devices.

An object of the invention is the provision of a mechanism for closing a circuit to an electrical device at a predetermined time and for controlling the length of time that the device is maintained in operation.

Another object of the invention is the provision of a mechanism for closing a circuit to an electrical device and for maintaining the circuit closed a predetermined length of time in which the mechanism may be reset for varying the duration of the closing of the circuit, the said mechanism including means for synchronizing a clock mechanism with the circuit closing mechanism.

A further object of the invention is the provision of a time controlled circuit closing mechanism for maintaining an electrical device in operation for a predetermined period of time in which a cam member is so constructed and operated in connection with the clock mechanism that it will close the circuit at a set time, the cam being reversible in movement for shortening the period of duration in which the circuit is closed.

This invention will be best understood from a consideration of the following detailed description, in view of the accompanying drawings forming a part of the specification; nevertheless, it is to be understood that the invention is not confined to the disclosure, being susceptible of such changes and modifications as define no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings,

Figure 1 is a view in perspective showing the dials of a time controlled circuit closing device constructed in accordance with the principles of my invention.

Figure 2 is a reduced view in perspective showing the rear of the circuit closing device.

Figure 3 shows more or less a diagram of the circuits.

Figure 4 is a longitudinal vertical section of the circuit closing device.

Figure 5 is a section taken along the line 5—5 of Figure 4.

Figure 6 is a fragmentary longitudinal vertical section taken along the line 6—6 of Figure 7.

Figure 7 is a vertical section taken along the line 7—7 of Figure 4.

Figure 8 is a transverse vertical section taken on the line 8—8 of Figure 5, showing the cam and contact member.

Referring more particularly to the drawings, 10 generally designates a casing, formed of any

suitable material, and which has a front wall 11, a rear wall 12 and a hinged top 13.

The front wall has a dial 14 of the usual type with a minute hand 15 and an hour hand 16 movable over the face. This clock, generally indicated by the numeral 17, is electrically operated and is connected by wires 18 and 19 to the house circuit by the usual plug 20.

The second dial 21 is located upon the face of the front wall 11 and is provided with numerals indicating twelve hours. A knob 22 is mounted for rotation at the center of the dial 21 and is provided with a pointer 23 which is adapted to be moved over the numerals when the knob is rotated for a purpose which will be presently explained.

Referring more particularly to Figures 4 and 7, it will be seen that a shaft 25 extends from the clock 17 and this shaft is rotated once every sixty minutes. To this shaft is connected a spring finger 26 which is normally engaged between a pair of pins 27 and a plurality of these pins are secured to one face of a wheel or disc 28 in such spaced relation that the spacing between each of the pins represents one minute. The spring finger 26 normally rests between a pair of these pins since said finger presses against the one face of said disc.

A shaft 30 is rotatably mounted in a bearing 31 formed in the rear wall 12 of the housing and is also supported by a bearing 32 formed in a bracket 33 which is secured at 34 to the inner face of the rear wall 12. The wheel 28 is mounted upon the inner threaded end 35 of the shaft 30 and is held in place by means of nuts 36.

A gear 40 is secured to the outer end of the shaft 30 adjacent the inner face of the rear wall 12 and meshes with a large gear 41 which is mounted for rotation on a stub axle 42 carried by the rear wall 12. This gear in turn meshes with a gear 43 which is secured to a shaft 44 by means of a set screw 45. The gears 41 and 43 are located in the same plane and adjacent the inner face of the rear wall 12.

The shaft 44 is supported at one end by a bearing 46 formed in the rear wall 12 while the opposite end is reduced as shown at 47 and received by a socket 48 formed in the inner end of a shaft 49 which extends through the front wall 11 and to which is connected the knob 22 by means of a set screw 50.

A disc 51 is rigidly secured to the shaft 49 beyond the inner face of the front wall 11 and is provided with a pair of circular contact members 52 and 53. The inner concentric contact 53 is

engaged by a spring contact member 54 secured at 55 to the front wall 11. A spring contact member 56 engages the outer circular contact 52 and is secured at 57 likewise to the front wall. A boss 58 is secured centrally of the disc 51 and receives the shaft 49 and is adapted to space the disc 51 from the inner face of the wall 11.

As shown more particularly in Figure 8, a cam disc 60 is rigidly secured upon the inner threaded end 61 of the shaft 54 by means of nuts 62. This cam disc has a flat portion 63 and a circular portion 64 over which a projection 65 is adapted to ride.

This projection is carried by a spring finger 66 which is secured at 67 to the inner face of the disc 51. The outer free end of the spring member is provided with a contact 68 adapted to be moved into engagement with a contact 69 when the projection 65 is located over the flat surface 63 of the disc 60. The contact 69 is secured at 70 to the rear face of the disc 51 as shown more particularly in Fig. 4.

The spring contact 54 is connected by a wire 71 to the wire 18, while the contact 46 is connected by a wire 72 to a bus bar 73. A second bus bar 74 is connected by a wire 75 with the wire 19. This bus bar 73 is provided with spaced spring fingers 76 and the fingers are associated with pairs of spring fingers 77 secured to the bus bar 74.

The rear wall 12 of the housing 10 is provided with the usual socket plate 78 which has spaced openings 79 and 80 to receive the spring fingers 81 and 82 respectively of a plug connected with a fan 83. These openings are adapted to receive the fingers 83 and 84 of a plug connected with a radio 85. Any number of pairs of openings 79 and 80 may be provided with the plate 78 to receive the contact fingers of plugs which are connected to various electrical devices such as toasters, radios, fans, and the like.

The operation of my device is as follows: Any type of electrical device such as a fan, radio, toaster, etc. may be plugged into the mechanism as shown in Figure 3 and the knob 22 may be operated to set the indicator 23 in alignment with one of the numerals on the dial 21, or the indicator may be set at any point between the pair of numerals which will indicate a time for the electrical device to be set in operation subsequent to the time indicated by the dial 14 of the clock. It is to be noted that the plug 20 is ordinarily connected with the house current so that the clock is operating continuously.

In Figure 1 the clock indicates 2 o'clock and if it be desired to set the radio at 4 o'clock the indicator hand 23 is moved to the numeral 4 on the dial 21 so that when the hands of the clock disclose the 4 o'clock period the radio will automatically be connected with the house current and will be set in operation.

When the cam disc 60 is rotated the projection 65 will be resting against the curved surface 64 of said disc so that the contacts 68 and 69 will be spaced apart. Since the disc 60 is revolved in synchronism with the clock mechanism at a considerably less speed and the size of the disc and the gear wheels 40, 41 and 43 are so proportioned the flat portion 63 of the disc 60 will give a 2 hour period while the remaining portion of the disc may represent various periods as will be presently explained. Thus, it will be seen that when the projection 65 is engaged by the flat portion 63 the instrument connected with the timing mechanism will operate for 2 hours unless the

projection 65 is adjusted along the flat portion 63.

When the knob 22 is revolved when moving the indicator 23 to a predetermined number on the dial 21, the disc 51 is likewise revolved as is the spring contact finger 66 since this contact member is secured to the disc 51. The knob 22 and the disc 51 are revolved normally clockwise so that the projection 65 is moved away from the end 65^a of the straight portion 63. Thus, for instance, when the indicator 23 is moved to the numeral 4 by the dial 21 and the hour and minute hands are located in the position shown in Figure 1, the projection 65 will be in engagement with the curved portion 64 and to the right of the position shown in Figure 8. It will require 2 hours of rotation of the disc 60 to cause the point 65^a of said disc to come into contact with the projection 65. As soon as the projection clears this point and drops in the flat portion 63 the contacts 68 and 69 will engage and thus close the circuit to the radio or some other electrical device. The electrical device will then be maintained in circuit for 2 hours.

If, on the other hand, it is only desired to maintain the electrical device in operation for a less period than the two hour period, the operator will then move the indicator hand 23 anti-clockwise until it points to 2:30 or 2:15 or whatever period is desired. In this manner since the disc 60, as shown in Figure 8, is revolving in the direction indicated by the arrow, the projection 65 will have been moved by the operation of the knob 22 to a point adjacent the opposite end 65^b of the straight portion 63 whereby the contacts 68 and 69 will remain closed only for a half hour or fifteen minutes. Shorter periods than this may be employed.

Again there may be times when it is desired to set the radio in operation immediately. Therefore, the radio is plugged into the housing, as shown in Figure 3, and if the clock is indicating 2 o'clock the indicator 23 is then moved to the numeral 2 on the dial 21. In this instance, if it is desired to permit the radio to operate for a half hour the indicator hand is then moved back one hour and a half or to 12:30. In each instance where a limited time is desired, such as 15 minutes, the indicator hand will be moved anti-clockwise 1 hour and $\frac{3}{4}$. In every instance the time determined upon for the instrument to be maintained in operation will have to be subtracted from 120 minutes and the indicator hand is moved anti-clockwise the number of minutes which remains from the 120 minutes.

When it is found that the clock mechanism and the indicator device are not operating in synchronism or, in other words, that when the indicator hand 23 is placed on the numeral 3 of the dial 21 the electrical device will be set in operation at 5 minutes to 3 instead of 3 o'clock the spring finger 26 is forced toward the front and out of engagement between a pair of the pins 27 and the wheel 28 is moved anti-clockwise for five of the spaces between the pins, since each space represents a minute. On the other hand, when it is found that the electrical device is late in being set in operation, then the spring finger 26 is released and the wheel 28 is rotated clockwise for the corresponding number of spaces or minutes representing the tardiness. In either instance, the indicator and the clock will be set in synchronism for proper operation.

I claim:

1. A controlling mechanism for electrical devices comprising a disc provided with a flat por-

tion, means rotating the disc once every twelve hours, operative connections between the disc and the rotating means said connections including a wheel having spaced pins and a spring finger connected to the rotating means, the free end of the finger being located between a pair of the pins, a second disc, means for manually rotating the second disc independently of the first disc, a circuit closer carried by the second disc and, means on the first disc for opening the closer for a predetermined period, and means for indicating the angular position of the second disc and means for positioning the opening means on the second disc in accordance with a predetermined time of the day.

2. A controlling mechanism for electrical devices comprising a spring finger, means rotating the finger once every twelve hours, a wheel having a plurality of pins spaced from each other a distance representing the duration of a minute, the free end of the finger removably disposed between a pair of the pins, a cam, operative connections between the cam and the wheel, a manually operated disc, a circuit closer mounted on the disc and actuated by the cams, a hand operated by the disc adapted to be set in correspondence with

a predetermined time of the day and indicating the position of the circuit closer, said cam being rotated to actuate the closer for closing a circuit for a predetermined period.

3. A controlling mechanism for electrical devices comprising a spring finger, means rotating the finger once every twelve hours, a wheel having a plurality of pins spaced from each other a distance representing the duration of a minute, the free end of the finger removably disposed between a pair of the pins, a cam, operative connections between the cam and the wheel, a manually operated disc, a circuit closer mounted on the disc and actuated by the cam, a hand operated by the disc adapted to be set in correspondence with a predetermined time of the day and indicating the position of the circuit closer, said cam being rotated to move the closer to an operative position and maintain the closer in said position for a predetermined period, the finger being movable away from the pins so that the wheel may be manually rotated in either direction for varying the position of the cam relative to the closer.

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