Nov. 14, 1939. B. GRIFFIN 2,180,047

ALARM DEVICE

Filed April 5, 1937 3 Sheets-Sheet 1

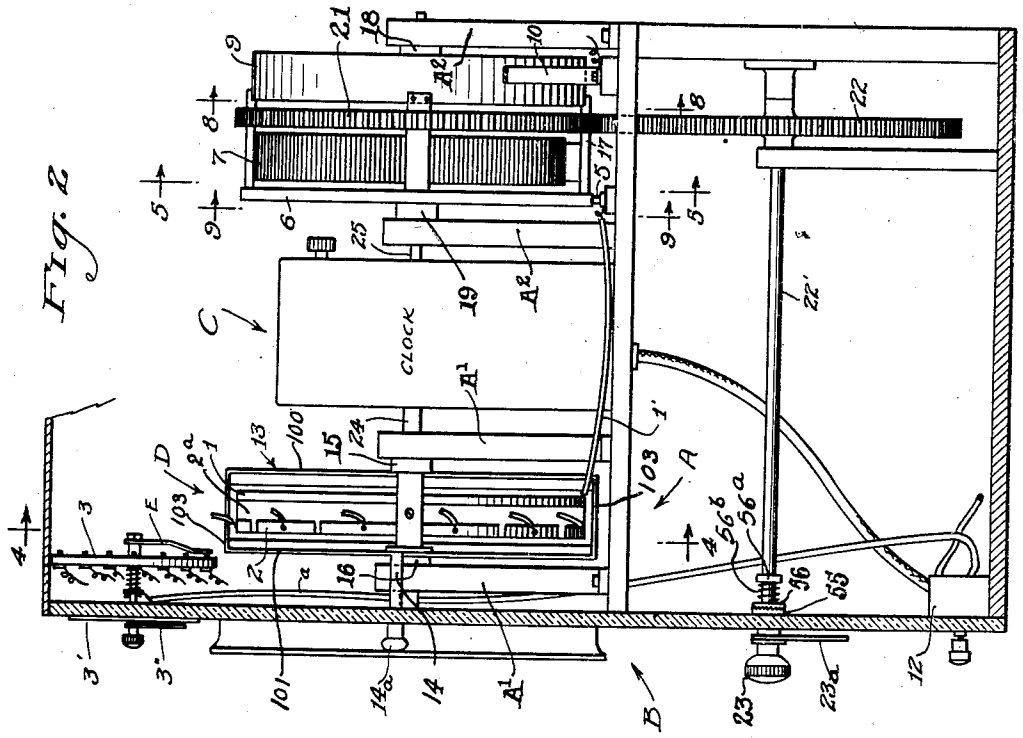


Fig. 2

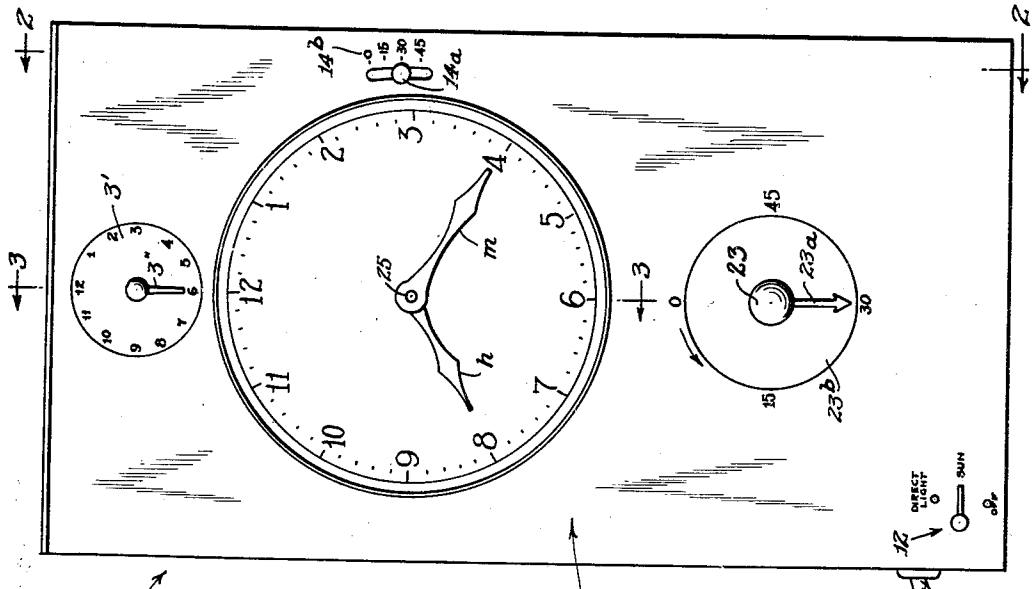


Fig. 1

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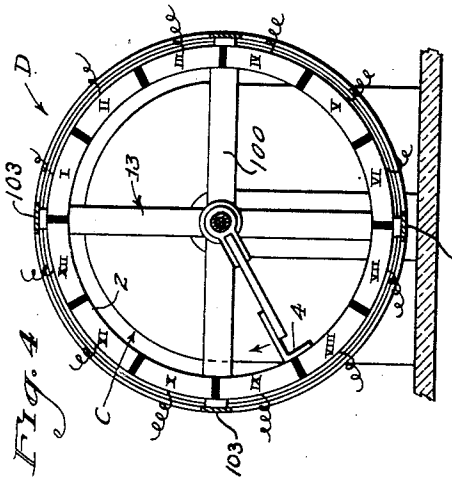


Fig. 4

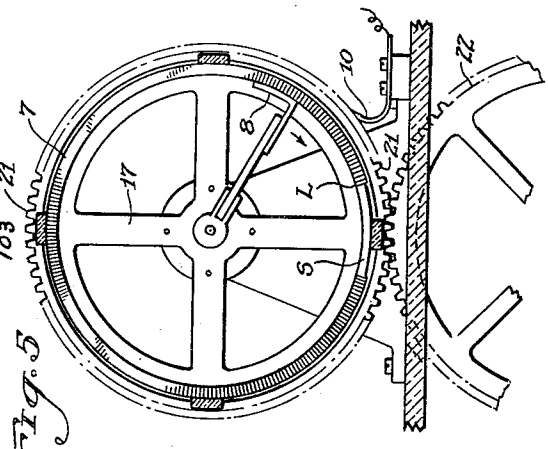


Fig. 5

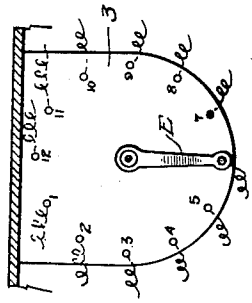


Fig. 6

Fig. 3

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Fig. 7

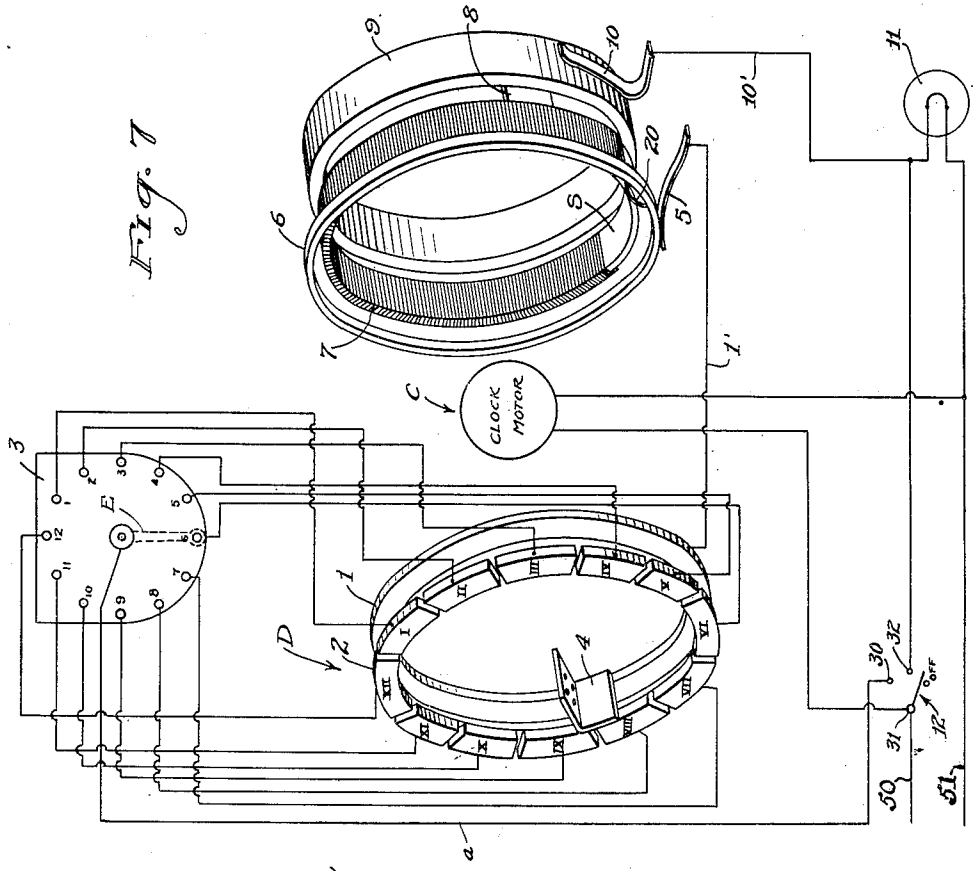


Fig. 9

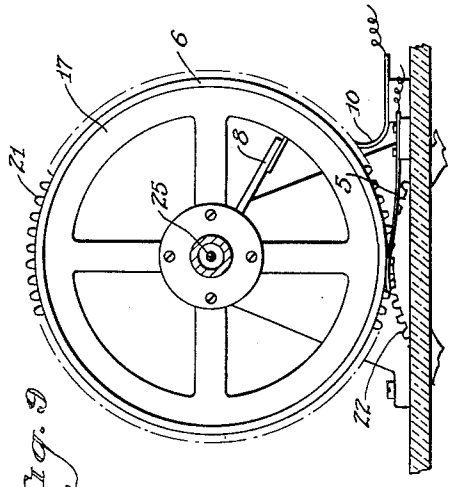
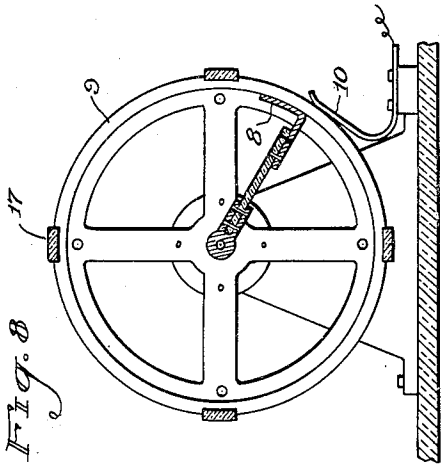


Fig. 8



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Patented Nov. 14, 1939 2,180,047

UNITED STATES PATENT OFFICE

2,180,047

ALARM DEVICE

Baldwin Griffin, New York, N. Y.

Application April 5, 1937, Serial No. 135,135

1 Claim. (Cl. 161—1)

This invention relates to signalling or alarm devices and particularly to those of the visual type.

One of its objects is to provide a device of this class which will automatically, upon having been set the night before, gradually create the effect of an artificial sunrise in a room occupied by a sleeper, in such a manner that the sleeper, especially if he be of the nervous type, will be effectively awakened, but without any of the surprise or so-called shock concomitant with the usual methods of awakening sleepers mechanically. If a person is suddenly awakened in total darkness, or by suddenly flashing a full power light upon his eyes, the result is usually somewhat of a shock, but if a person be awakened by automatically gradually increasing the brilliance of a source of light, the optic nerves of the eye will gradually be prepared to receive the full and awakening brilliance of the light thus entirely avoiding the well-known shell-shock symptoms going with certain kinds of alarms.

A particular object of the invention is to provide a device for automatically bringing a light from extinction to intense brilliance or vice versa, beginning at a predetermined time and lasting for a fixed time.

A further object of the invention is to provide a device of this character which will be inexpensive to manufacture and therefore of a low price, yet accurate, rugged and durable.

Another particular object of the invention is to provide an alarm device of this nature which will be capable of being either housed under one cover or of being mounted as separate units geared with a separate clock, the hour and minute shafts being geared respectively as to clock and as to each unit.

A further particular object of the invention is to provide a device of this class which, instead of being in the form of the usual unsightly structure, with a multiplicity of unsightly wires extending therefrom, will be a neat attractive article tending to enhance the appearance of any room.

The other objects and advantages of the invention will be made manifest as this specification proceeds.

The presently preferred embodiment of these inventive concepts has been disclosed in the accompanying drawings and will be described in the following matter, by way of exemplification only, the invention being limited in its embodiments only by the scope of the sub-joined claim.

In these drawings:

Fig. 1 is a front elevational view, somewhat diagrammatic, of the complete device;

Fig. 2 is a vertical longitudinal section, partly in elevation, on line 2—2 of Fig. 1;

Fig. 3 is a vertical substantially central longitudinal section of the upper part of the device, on section line 3—3 of Fig. 1;

Fig. 4 is a vertical section on line 4—4 of Fig. 2;

Fig. 5 is a partial section on line 5—5 of Fig. 2;

Fig. 6 is a rear elevational detail of the upper part of Fig. 3;

Fig. 7 is a wiring diagram of the device, partly in perspective;

Fig. 8 is a vertical section on line 8—8 of Fig. 2; and

Fig. 9 is a section on line 9—9 of Fig. 2.

The device shown in Figs. 1 to 6, inclusive, comprises essentially a casing or supporting frame A, an instrument panel B, a clock C of conventional design and associated mechanism to be hereinafter described. A selector device D is provided and comprises a cutaway casing or cradle 13, rotatably supported in standards A^1 wherein are mounted an electrically conducting ring 1 of approximately circular shape, associated with and held in spaced parallelism with respect to a series of segments 2, arranged in a circle and mounted in insulative material 2^a. In the embodiment here shown, twelve equi-distantly spaced segments 2 of an electrically conducting material, such as copper, are mounted in an electrically insulative ring 2^a and insulated from each other in the manner shown, it being understood that the ring 1 and the segments 2 are mounted in and held by the annulus 2^a of electrically insulative material substantially as shown. It will be observed that the cradle or frame 13 comprises a pair of end pieces 100 and 101 consisting of spread arms substantially as shown in Fig. 4, said end pieces being connected together by cross-pieces 103 attached to the ends of said arms as depicted in Figs. 2, 3 and 4. A selector switch 3 is provided in the upper part of the casing, as shown, and each one of the segments 2 in sequence is electrically connected to a corresponding point on the selector switch 3. It will be apparent, of course, that the wires connecting the points of the selector switch and the segments 2 are sufficiently slack as to permit substantial, say about 30°, rotation of the cradle 13 and associated apparatus. The rotor E of the selector switch is attached, by means of a cable *a* to one side of a two wire current supply, or the like. It is to be observed that the shaft carrying the arm

E, though substantially freely rotatable, is provided with a spring-pressed collar tending to increase friction acting on the shaft whereby, when once set, it will not easily and without external stimulus, move from the set position.

The clock C has a hollow, tubular shaft **24** and a shaft **25**, the former being positioned concentric, the latter substantially as shown, the shaft **24** serving to move the hour hand *h* and the shaft **25** serving to move the minute hand *m*. A brush **4** is mounted on the hour hand shaft **24**, as best shown in Fig. 4, and functions to connect ring **1** successively to each of the segments **2** as the shaft **24** rotates.

By means of a wire **1'**, current is carried from ring **1** to a brush **5** mounted on the common platform shown for the clock, etc.

A cutaway framework **17** similar in structure and appearance to the frame or cradle **13** hereinabove described is rotatably supported in standards A^2 and is disposed so that the minute shaft **25**, at its far end, passes therethrough as shown best in Fig. 3, and this frame **17** supports several elements. One of these elements is a ring of electrically conductive material, **6**. The brush **5** is so placed as to be in contact with ring **6**. A rheostat or resistor coil **7** is also mounted on the frame **17**, as best shown in Fig. 3, and a wire **20** carries current from the ring **6** to said coil. The resistance coil **7** consists preferably of a single length of bare resistance wire wound on a cylindrical non-conductive core with a blank space, S, as indicated best in Fig. 5.

A conducting ring **9** is also supported by the circular frame **17**, as by means of screws, as shown in Fig. 3. A brush **8** contacts the inner peripheries of this ring **9** and the bare wire resistor coil and is mounted on the minute-shaft **25**. It will be understood, therefore, that the resistance of the whole circuit can be progressively reduced as the shaft **25** turns in the proper direction.

A brush **10**, shown best in Fig. 2, is provided to take the current from the conducting ring **9** and carry it thru the lamp, or parallel or series-arranged groups of lamps, by which the room is illuminated and by which the gradual sunrise effect is produced, by means of a wire **10'**. The current, of course, flows from the lamp back to the lead-in wires for the house lighting circuit. A single-pole triple-throw switch, **12**, best shown in Fig. 7, but also visible in Fig. 2, housed in the box in the lower part of the cabinet, is employed to send the current either through the device to cause the artificial sunrise, or to send the current directly through the lamp alone when it is not desired to use the device.

The ring **1** and segments **2** hereinabove referred to are mounted in a cradle support **13**, the latter being rotatably mounted in standards A', as hereinbefore mentioned and as shown best in Fig. 3. The ring and segments are insulated from their supporting cradle and so mounted concentric the shaft **24** that they may be rotated, while connected together, through an angle of as much as 30°, by means including an arm **14**, shown best in Fig. 2, mounted near a peripheral portion of the substantially cylindrical casing **13**, extending in substantial parallelism to the axis of rotation of the casing and being provided with a knob portion **14***a* projecting through a slot in the instrument panel. It will be noted that a graduated scale **14***b* showing the minute settings is provided on said panel, positioned adjacent the projecting portion of said arm to assist in adjusting the device as will be hereinafter described.

The cutaway substantially cylindrical supporting cradle **13** is mounted on bearing elements **15** and **16** positioned axially thereof and rotatably received in the standards A', so that the hour-hand shaft **24** passes through the cradle **13** without touching same, thus enabling a segment to be set with the insulation at its left-hand side parallel with the desired hour mark. It will be noted that, inasmuch as each segment is of about 30° arc, it will take the brush **4** about fifty minutes to traverse it.

In a manner analogous to that described in connection with the cradle **13**, the substantially cylindrical cradle or frame **17** is also mounted by means of hollow journals **18** and **19**, concentric of the minute shaft **25** and rotatably held in standards A^2, substantially as shown. This unit may also be rotated to set the device for a given minute of alarm by means of a gear **21**, preferably made of fiber, carried on the frame **17** and meshing with a fiber gear **22** mounted on a shaft **22'**, shown best in Fig. 2. This gear **22** is rotatable through the desired angle to set the device to predetermined positions, this being facilitated by means of a knob **23**, associated with an indicator **23***a* cooperating with a scale **23***b*, shown best on the instrument board in Fig. 1, said scale being divided, for example, into divisions corresponding to fifteen minutes each, or in other or further graduations if desired in order that the resistor unit may be synchronized with the predetermined time of operation chosen, in the manner to be hereinafter described. It will be noted that the shaft **22'** whereby the gear **22** is rotated, is provided with friction augmenting means comprising a stationary toothed annulus **55** mounted on the panel B, and an annulus **56** attached to the shaft and pressed by the spring **56***b* held by the fixed standard **56***a* mounted on the panel B, whereby, when said indicator **23***a* is set to the desired position on the scale **23***b*, said members will at least tend to prevent accidental rotation of said shaft.

Referring now to Fig. 7, it will be noted that certain elements of the apparatus shown in Figs. 1 to 6, inclusive, are associated with each other by means of an electrical circuit, therein diagrammatically illustrated. It will be seen therefrom, among other things, that the device is connected to power supply lines **50** and **51**, the triple-throw switch generally designated at **12** being interposed in the line **50** whereby a lamp or set of lamps, diagrammatically shown at **11**, can be directly connected to said lines by connecting the terminals **31** and **32** of said switch or connected to the lines through the device by connecting the terminals **31** and **30**, or, if desired, disconnected by moving the switch arm to the "off" position. It will be apparent that the clock motor C is connected to the line **50** at the pole **31** of the switch **12**, and directly to the other line **51** as shown, whereby said clock is always in circuit with the lighting circuit of the room. When the terminals **31** and **30** of the switch **12** are connected, however, it will be noted that the contact arm E of the selector switch is electrically connected to the line **50** and through terminals engaging with said arm, the segments **2** are also connected to said line **50**. It will be apparent then, from this figure, that said line **50** is connected to said lamp or lamps **11** through the segments **2**, the bridging brush **4**, ring **1**, line **1'**, spring or brush **5**, ring **6**, wire **20**, resistor **7**, bridging brush **8**, ring **9**, spring or brush **10** and line **10'**, the circuit with the power supply lines being completed by the line **51** which is directly connected to said lamp or lamps, substantially as shown.

In Fig. 9, a section taken to show the construction and mounting of ring **6** and associated members more clearly, the two brushes **10** and **5**, respectively, which wipe rings **9**, **6**, respectively, are shown, as is also the cutaway structure of the cradle and arrangement of the supporting members whereby it is rotatably held in the standards A^2, as hereinbefore described.

In Fig. 8, which is a vertical section taken just anterior of the rear end of the ring **9**, the internal structure of said unit is shown in detail as well as the construction of the brush **10** and the ring **9** and of the internal wiper **8**.

In the operation of the device, assuming for purposes of example that the user desires to be awakened at about 6:30 o'clock, the segment-selector **3''** cooperating with the scale **3'** is set, at the desired hour, in this instance 6 o'clock, and the knob **14a** is moved to a position "30" on the scale cooperating therewith, thereby causing the segments **2** to be shifted approximately 15° in a counter-clockwise direction whereby the sweeper arm **4** comes into contact with the individual segments, as the arm is rotated by the hour-hand carrying shaft of the clock, about one-half hour later than would be the case if the segments were not shifted. By movement of the indicator **23***a* across the scale **23***b* to the point "30", the gears **22** and **21** function to rotate the resistor **7** and associated elements whereby the open portion S of the resistor support is rotated approximately 180° from the position it occupies when the indicator **23***a* is at "0". Having set the components of the device as aforesaid, the switch **12** is then moved to "on" position (30), and when the hands of the clock next indicate 6:30 o'clock, the lamp or lamps **11** will be supplied with power in steadily increasing amounts.

Accordingly, it will be seen that the current-path or circuit including the power source and lamp or lamps is substantially complete except for the brush **4**, revolved by the hour-hand carrying shaft **24** of the clock and the brush or wiper **8** rotated by means including the minute-hand carrying shaft **25**. Regarding particularly the brush **4** and cooperating members, it will be noted that as said brush is rotated by said shaft, it will move across the segments **2** until it is positioned at the near-edge of the insulation between segment VI and segment V. When the brush **4** comes in contact with segment VI, it completes the circuit between the line **50**, segment VI and by bridging ring **1** and the segments **2**, completes the circuit through wire **1'** to brush **5** and ring **6**. In passing over segment VI, which is about 30° in arc, about an hour will be required. It will be apparent that, due to setting ahead of cradle **17** by means including member **23** as aforesaid, and of the cradle **13** by knob **14***a*, said brush **8** will require about 53 minutes of time to transverse the resistor **7** from the beginning until it reaches the end L where, the resistance of the circuit then being least, the lamp or lamps **11** will have reached maximum brilliancy, due to current being sent substantially directly from the line 1^1 through the brush **8** to ring **9**, and, by means of the brush **10**, to the lamp or lamps **11**. When brush **8** slides off onto the bare space S, the circuit is broken and the light goes out; however, the light will stay on if the switch **12** is manipulated to connect the terminals **31** and **32**.

That is to say, with the parts set as aforesaid and with the clock functioning, the shafts **24** and **25** continue rotating, the switch **12** having been set, on retiring, on point 30, and the clock being here assumed to be an electric clock connected to the house lighting circuit, but which clock can just as well be a mechanical clock. This causes the brushes **4** and **8** set on the hour-shaft and on the minute-shaft, respectively, at angles identical with and in parallelism with the clock hands, to slowly revolve in synchronism with the clock hands. When the clock hands, and brushes, reach the hour and minute relation set on the dials **3'** and **23***b* and on the arcuate scale **14***b*, the incandescent lighting system of the room will gradually increase in brilliancy due to the brush **8** moving on the resistor ring from the point of highest resistance towards the point of lowest resistance, which latter point coincides with the time set. The movement near the time for alarm or arising of the user, occupies only minutes from a condition of total extinction of the light to the condition of greatest brilliancy of the light, usually about 53 minutes, or other time, depending on length of resistance coil. The length of the contact area of the several brushes permits the maintenance of this maximum brilliancy for several minutes, usually five minutes. At the end of this time it is desirable for the switch **12** to be so thrown as to by-pass the whole device and send the current directly into the lamp, which is done by throwing the switch **12** into position **32**. The light, of course, can be changed from extreme brilliancy back to extinction by revolving the cradle **17** in the opposite direction. It is to be noted that the insulation, between the segments which is at the left end of the segments, is the marker that is set on line with the time that the light reaches full brilliance.

If desired, a separate audible alarm may be connected in circuit to also be actuated by the time switch; or, if desired, the clock may be of the type that already incorporates an audible alarm.

It is to be understood that instead of being constructed as a unit and housed under a single cover, as shown, the device may just as well be mounted in the form of separate units with the hour and minute shafts geared respectively as to clock and as to unit.

It is also to be understood that only the actual contact areas of the brushes are to be made of conductive material, the rest of the brushes being made of non-conductive material. Due to the fact that these brushes are continuously in motion and always in contact with the inner surfaces of the rings, it is contemplated that they have a slotted bolt hole and bolt arrangement whereby they may be let out to compensate for the wear resulting on the contact end.

From the foregoing disclosure, it should be manifest that the applicant has devised a compact visual, or combined visual-and-auditory, alarm, which embodies but the minimum number of parts necessary for accomplishing the objects set forth above and is relatively inexpensive to manufacture, yet, withal, accurate and rugged in use and unfailing in its purpose.

I claim:

An alarm device for a building having lighting circuit terminals, comprising a framework, a clock mechanism therein having a minute shaft and an hour shaft concentric thereof; a first unit comprising selector means associated with and operated by said hour shaft including a plurality of electrical contact points and an arm carried on said hour shaft wiping said contact points; a switch for connecting certain of said contact

points of said selector means to one of said circuit terminals corresponding to a selected hour of operation; a rheostat unit interposed between one of said circuit terminals and said selector means, operated by said minute shaft; and means for adjusting said rheostat unit with respect to the setting of the first unit whereby, when said selector means functions upon arrival of the hour shaft at the predetermined selected position, said rheostat will be at position of maximum electrical value and will thereafter diminish in electrical value.

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