June 24, 1930. W. J. COWARD 1,767,347

TIME CONTROLLED SWITCH

Original Filed Oct. 3, 1927 3 Sheets-Sheet 1

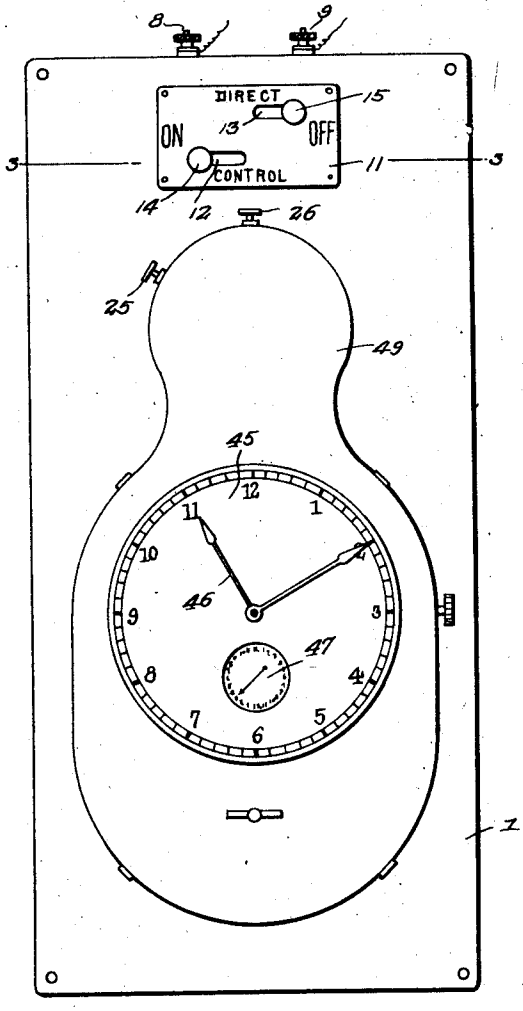


Fig. 1.

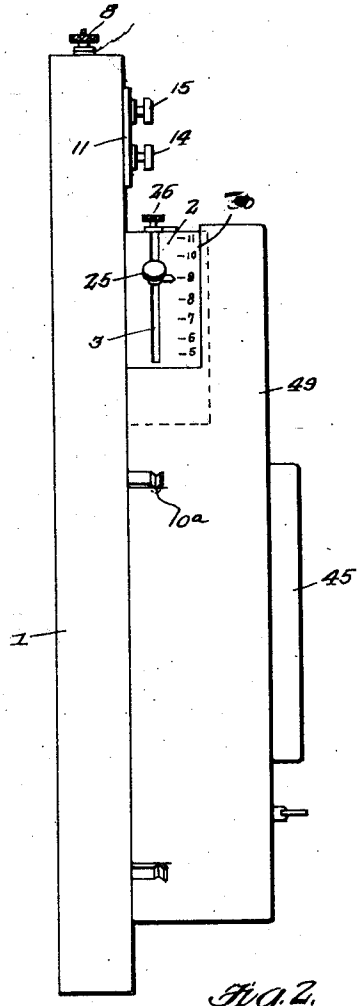


Fig. 2.

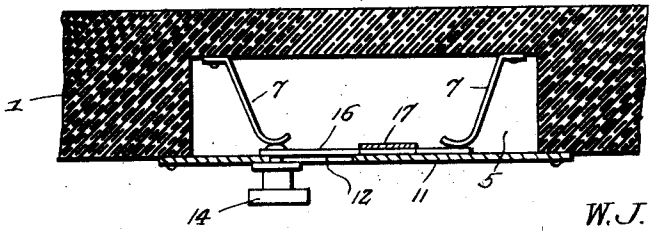


Fig. 3.

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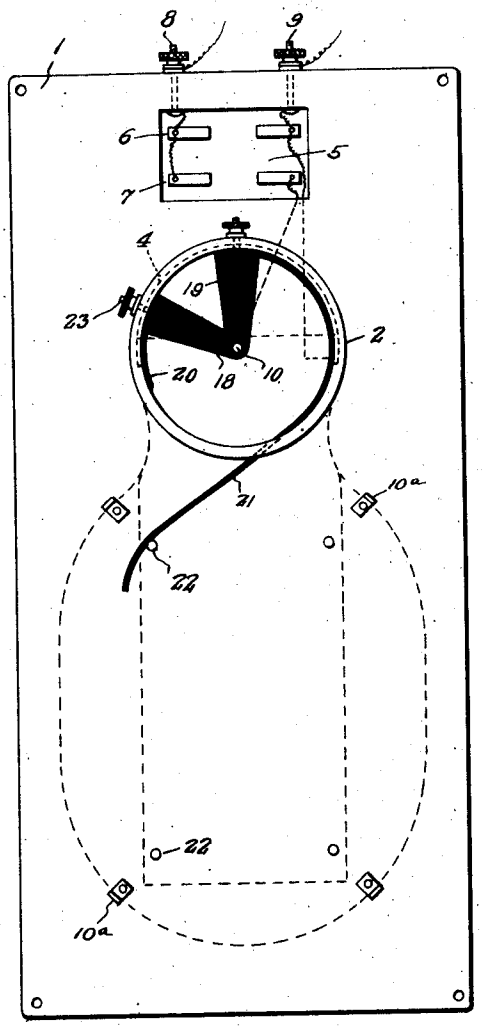


Fig. 4.

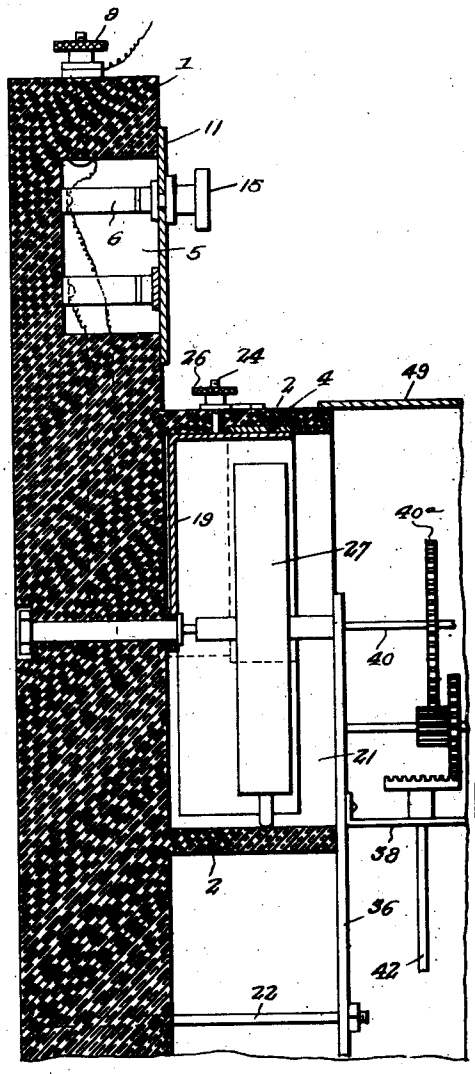


Fig. 5.

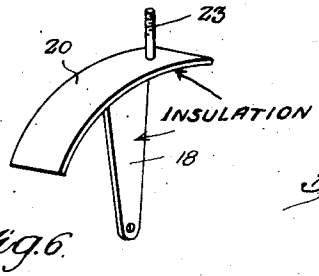


Fig. 6.

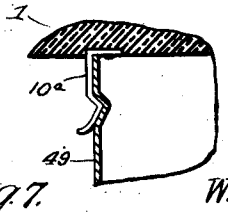


Fig. 7.

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TIME CONTROLLED SWITCH

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Fig. 8.

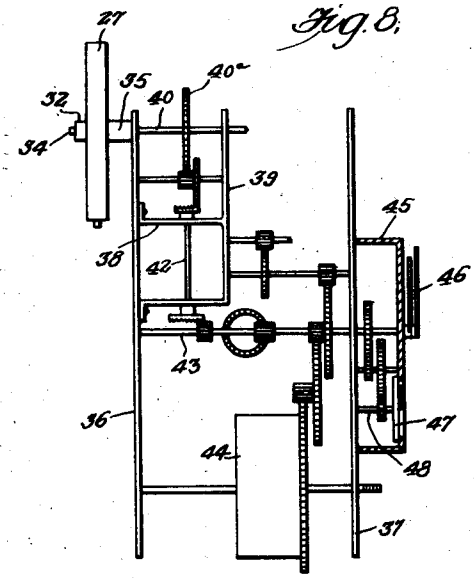
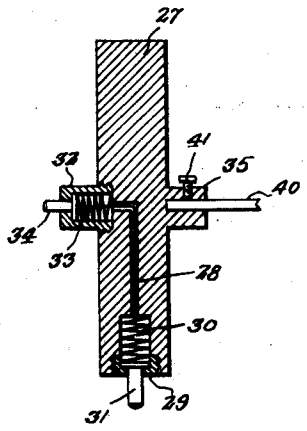


Fig. 9.



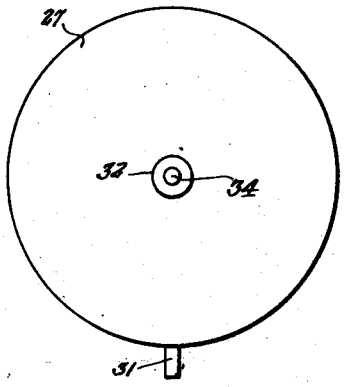


Fig. 10.

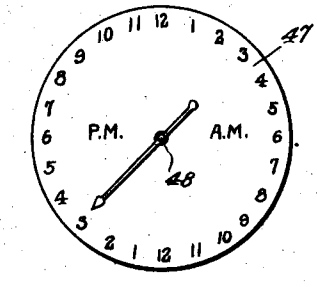


Fig. 12.

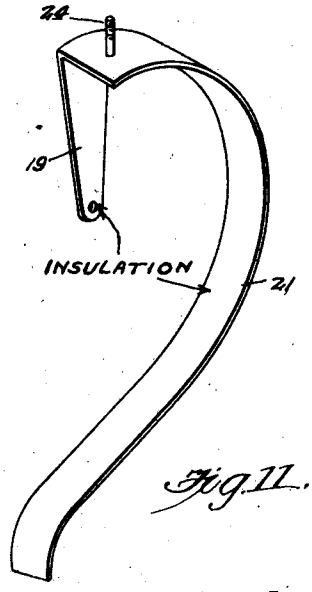


Fig. 11.

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Patented June 24, 1930

1,767,347

UNITED STATES PATENT OFFICE

WILLIAM JENNINGS COWARD, OF LAKELAND, FLORIDA, ASSIGNOR OF ONE-HALF TO CHARLES H. PHILLIPS, OF BINGHAMTON, NEW YORK

TIME-CONTROLLED SWITCH

Application filed October 3, 1927, Serial No. 223,683. Renewed February 13, 1930.

My invention relates to improvements in time controlled switches, and for a more particular reference, the same pertains to a switch construction in association with a clock mechanism whereby an electrical circuit may be made or broken for a predetermined period.

My invention is particularly useful to merchants having electrical illuminating window displays, which are required to be extinguished at a certain hour at night after which their advertising propriety is deemed no longer profitable.

In this instance, the merchant or proprietor of the establishment must return to the store to switch off the lights. The purpose of my invention therefore, is to provide such a device, which will eliminate this disadvantage and which will automatically perform this operation.

An object is to provide a novel switch construction associated with a clock mechanism whereby an electrical circuit may be made or broken for a predetermined period by the prior setting of the switch elements.

Another object resides in the novel construction of an indicating means I employ to represent the a. m. and p. m. period of a complete day, which will facilitate the proper setting of my device.

Another object resides in the novel and positive switch construction I have provided for making or breaking the circuit to the display lights.

Other very novel and advantageous objects will become apparent as the invention is better understood from the specification and claims to follow.

In the drawings:—

Figure 1 is a front elevation disclosing the exterior appearance of my device.

Fig. 2 is a side elevation of the device illustrated in Fig. 1.

Fig. 3 is a cross sectional view taken approximately on the line 3—3 of Fig. 1, the same illustrating the base in the control plate in sectional view with the control elements in position in respect therewith.

Fig. 4 is a front elevation of my device, showing the slot mechanism and casing thereof removed, disclosing the contact band and the means for limiting the exposure thereof.

Fig. 5 is an enlarged vertical sectional view through the upper portion of my device illustrating the novel construction of the control and switch features.

Fig. 6 represents one of the elements illustrated in Fig. 4, adapted for limiting the exposure of the contact band.

Fig. 7 is a fragmentary sectional view of the space and clock mechanism casing disclosing the means for securing the same together.

Fig. 8 is the modified clock mechanism employed for operating the novel switch means, and at the same time employed for operating the clock.

Fig. 9 is a sectional view through the rotor of my novel switch construction, showing the spring projected contact element assembled in respect therewith.

Fig. 10 is a front elevation of the rotor as is represented in Fig. 9.

Fig. 11 is an enlarged perspective view of the opposite element employed for limiting the exposure of the contact band, and which is shown in position in Fig. 4, and

Fig. 12 represents the frame of an indicating dial, employed for facilitating the setting of my improved time controlled switch mechanism.

For a more detailed explanation of my invention, I now refer to the drawings in which like numerals designate like parts. The base 1 is constructed preferably of porcelain or any other suitable electrical insulating material, and which may be conveniently provided with an outwardly projecting annular flange or wall 2, in the upper portion of which is formed a longitudinal slot 3.

A semi-circular shaped contact band 4 is associated with the inner surface of the wall 2 and is adapted to have its outer surface in flushed relation with the inner surface of the wall. A substantially rectangular-shaped recess 5 is formed in the base, at the upper portion thereof. The back wall of said recess having secured thereto pairs of oppositely spaced spring contact fingers 6 and 7 respectively.

A pair of binding posts 8 and 9 respectively are adapted to project through the base, and into the recess 5, and are provided at their threaded end portions with knurled binding nuts securely retaining the conductor wires in connection therewith.

The upper and lower pairs of contact fingers 6 and 7 respectively, are each connected together by a suitable conductor element, and are provided with a conductor extension wire to the respective binding posts 8 and 9. The upper finger of the pair is electrically connected with the binding post 9, while the lower spring finger element is in electrical wired connection with an elongated conductor rod 10, extending transversely through the base and stationarily retained in place by any means found suitable.

The forward end of said rod is preferably formed with a recess therein. A plurality of spring latch members 10^a are arranged in projected position on the front of the base.

A plate 11 of suitable insulating material is adapted to be disposed over the recess 5, and in secured relation to the base, the same being formed with slots 12 and 13 respectively, to which are slidably associated the reduced shank portion of knob members 14 and 15 respectively. These knobs are provided with elongated contact plates 16 adapted for snug but slidable relation against the inner side of the plate 11. Suitable guide plates 17 are provided for maintaining the contact plates in proper position.

Pivotally associated with the recessed end portion of the conductor rod 10, is a pair of complementary insulating arms 18 and 19 respectively. The arm 18 is provided with an elongated arcuately shaped insulating plate 20 adapted for snug slidable engagement against the contact band 4 and inner surface of the wall 2. The complementary arm 19 is also of insulating material and provided with a substantially longer curved insulating strip 21 which is adapted at its lower end portion to tensionally engage over one of the bolt members 22 projecting from the base 1. The respective insulating members 20 and 21 respectively, are provided with threaded bolts 23 and 24 respectively, projecting therefrom and through the slots 3.

Knurled nuts 25 and 26 respectively, are threaded on the threaded bolts, and are adapted to be tightened against the outer surface of the annular wall 2 for securely maintaining the insulating members 20 and 21 respectively, in engagement against the contact band 4.

As is clearly shown in Fig. 5 of the drawing, a rotor 27 is rotatably mounted within the space enclosed by the annular wall 2. The rotor is of a disc-shaped construction and as is shown in Fig. 9 of the drawing, a bore 28 communicates at one end with an internally threaded recess axially located in the rotor, while the opposite end of the bore communicates with a second internally threaded recess on the periphery of the rotor.

In the peripheral recess, a threaded plug 29 is threaded, and formed with an opening therein. A spring 30 is disposed within this recess, and is adapted to normally maintain the contact pin 31 projected through the opening in the plug. The axially located recess has a collar 32 threaded therein, and a coiled spring 33 disposed within said collar. A contact pin 34 is adapted to be normally projected through an opening in the end of the collar.

Formed axially on the opposed surface of the rotor is a collar 35 having a bore extending inwardly from the end thereof. A pair of parallel upright walls 36 and 37 respectively, are secured together by any means found convenient, and further secured to the base 2 by bolt members 22. The wall 36 is provided with a U-shaped frame 38 and the upper portion thereof. This frame is provided with an upwardly projecting leg member 39. A shaft 40 rotatably mounted at the top of the leg 39, and wall 36 respectively, has keyed thereon, a gear wheel 40^a.

The shaft is adapted to project through the wall 36 and adapted to have its end portion engageable within the bore of the collar 35 on the rotor, and secured therein in place by a suitable set screw 41 located on the collar 35.

A vertical shaft 42 is mounted for rotation through the leg portions of the U-shaped frame 38, the upper end of said shaft having associated therewith suitable gearing in mesh relation with the gear 40, for rotating the shaft 40^a in a two-to-one ratio step down relation. A main shaft 43 journaled through the walls 36 and 37 respectively, and in rotatable rotation with the lower end of the vertical shaft 42, is adapted to have keyed thereon suitable gearing in mesh relation with the conventional clock spring mechanism 44.

The wall 37 is provided with an annular casing 45, through which one end of the shaft 43 is adapted to project. The projected end portion of said shaft is provided with the usual hour and minute hand 46, operated in the usual manner. However, after the lower portion of the casing, a dial 47 is provided through which a rotatable shaft 48 is centrally projected. The shaft 48 is

stepped down by a meshed relation with shaft 43 in substantially two-to-one ratio.

A casing 49 having formed therein an opening through which the annular casing 45 is adapted to project. The upper portion of the casing is cut away at 50, and is clearly shown in Fig. 2 of the drawing, to expose the upper portion of the annular wall 2 of the space. Adjacent the edge portion of the casing, at spaced intervals around its exterior, recesses are formed in which are adapted to engage the spring latch members 10^a, projecting from the base 2, for maintaining the casing in secured position in respect to the base.

In operation, by having suitable conductor and lead wires connecting the binding posts 8 and 9 respectively, the same being in circuit with display lights or other illuminating devices. By positioning the contact plate 16 in the position shown in Fig. 3 of the drawings, a circuit will be maintained through the spring contact fingers 7 to the conductor bar 10.

One of the contact fingers 6 in electrical connection with the binding post 9 has a connector wire leading therefrom, to the semi-circular contact band 4, disposed in flush relation with the inner surface of the wall 2. Now, as is clearly shown in the drawing, when the insulating members 20 and 21 are brought into spaced relation to each other, the band 4 is exposed for a distance. While the band 4 is thusly exposed, and during the rotation of the rotor 27 carrying the spring projected contact member 31, the said contact fingers 10 will ride against the insulating plate 20 until it engages the exposed portion of the band.

When this contact of the pin 31 and the band 4 takes place, a circuit is completed with the display device. The pin 31 will continue to move on the exposed band until the same reaches the insulating plate 21, when it rides onto the insulating plate, thusly closing or breaking the circuit.

The dial 47 provided with the indicating pointer associated therewith in two-to-one step down relation from the shaft 43, is adapted to indicate the two periods of a twenty-four hour day. This dial will greatly simplify the setting of the insulating plates 20 and 21 respectively, in respect to the a. m. and p. m. indications on the upper exterior of the annular wall 2.

Having thus described my invention, what I claim as new is:—

1. In a time controlled switch mechanism, comprising, an annular wall, a contact plate arranged for association with the inner side of the annular wall, insulating members adapted to be adjusted in spaced relation to each other, upon the contact band, and a movable contact member adapted to ride upon said insulating members, and to engage the exposed portion of said band between said spaced insulating members for closing an electrical circuit, and means for operating said movable contact member.

2. In a time controlled switch mechanism, an annular wall, a semi-circular contact band arranged flush with the inner side of the wall, a pair of insulating elements adapted to be adjusted in spaced relation to each other upon the contact band, and a rotatable contact adapted for engagement in the exposed portion of the band between the spaced insulating elements.

3. In a time controlled switch mechanism, comprising a base, an annular wall projecting from said base, a contact band arranged on the inner side of said wall, a pair of arcuate shaped insulating elements adapted to cover said contact band, said insulating elements adapted to be adjusted in spaced relation to each other, and a rotatable contact element adapted to engage the exposed portion of the contact band, for closing an electrical circuit.

4. In a time controlled switch mechanism, comprising, a base, an annular wall projecting from said base, a contact band arranged on the inner side of the wall, a pair of arcuate-shaped insulating elements, adapted to cover over said contact band, said insulating elements adapted to be adjusted in spaced relation to each other, a disk-shaped rotor mounted within the wall, and a spring projected contact pin carried by said rotor adapted to engage the exposed portion of the contact band for closing an electrical circuit.

5. In a time controlled switch mechanism, comprising a base, an annular wall projecting from said base and formed with an elongated slot therethrough, a stationary contact band arranged on the inner side of said wall, an insulating member adapted to cover the contact band, said member being provided with an element adapted to project through said slot, means associated with said element for drawing said insulated member in adjusted position on the band, and a rotatable contact element mounted within the interior of the said wall and adapted for contact with the band.

6. In a time controlled switch mechanism, comprising a base, an annular wall projecting from said base and formed with an elongated slot therethrough, a stationary contact band arranged on the inner side of said wall, an insulating member adapted to cover the contact band, said member being provided with an element adapted to project through said slot, means associated with said element for drawing said insulated member in adjusted position on the band, a rotatable contact element mounted within the interior of the said wall and adapted for contact with the band, said rotatable contact element adapted to be rotated by the clock mechanism.

7. In a time controlled switch mechanism comprising, a base, an annular wall project-

ing from said base, a contact band arranged on the inner side of said wall, a pair of arms pivotally mounted within the wall, arcuately shaped insulating members carried by said arms and adapted to cover said contact band, said insulating element adapted to be adjusted in spaced relation to each other, and a rotatable element adapted to engage the enclosed portion of the contact band for closing an electrical circuit.

In testimony whereof I affix my signature.

WILLIAM J. COWARD.