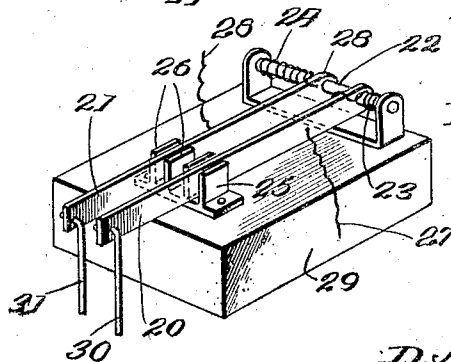
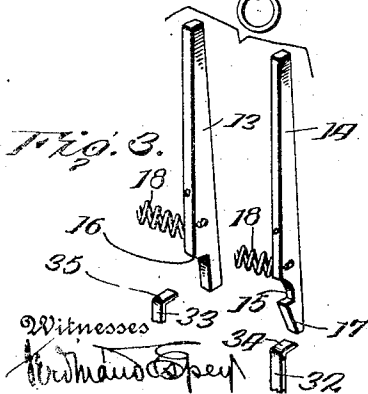


1,064,290.

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Inventor

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UNITED STATES PATENT OFFICE.

DEAN A. CATO, OF SPRINGFIELD, ILLINOIS.

TIME-ACTUATED ELECTRIC SWITCH.

1,064,290.

Specification of Letters Patent.

Patented June 10, 1913

Application filed January 6, 1912. Serial No. 669,815.

To all whom it may concern:

Be it known that I, DEAN A. CATO, citizen of the United States, residing at Springfield, in the county of Sangamon and State of Illinois, have invented certain new and useful Improvements in Time-Actuated Electric Switches, of which the following is a specification.

My invention relates to electric switches, and particularly to means actuated by a clock movement whereby a circuit may be broken and again made or completed at predetermined periods of time.

The primary object of my invention is to provide a very simple switch actuating device adapted for closing a circuit, such as say a lamp circuit at a predetermined moment, and again breaking said circuit at a later predetermined moment.

A further object of the invention is to provide a construction of this character of extreme simplicity, entirely positive in its action, readily set and having very few parts to get out of order.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings wherein:

Figure 1 is a longitudinal sectional view on the line 1—1 of Fig. 2. Fig. 2 is a longitudinal sectional view on the line 2—2 of Fig. 1. Fig. 3 is a perspective view of the two detents detached from the related mechanism. Fig. 4 is a perspective view of the switch detached from the casing. Fig. 5 is a sectional perspective view of the switch controlling disk 7.

Corresponding and like parts are referred to in the following description and indicated in all the views of the accompanying drawings by the same reference characters.

Referring to these drawings, 2 designates a casing of any suitable construction but shown as rectangular in form and provided on its outside face with a clock dial 3. This clock dial is not absolutely necessary to the proper operation of the switch, but it is extremely convenient.

Passing through the face of the casing is the arbor 4 constituting the hour arbor or shaft of any desired clock mechanism. This hour arbor carries the hour hand 5 which moves around the dial 3, and also mounted upon the arbor 4 is a minute hand 6.

Carried upon the hour arbor and rotating

therewith is a disk 7 preferably composed of sheet metal, the disk 7 being spaced from the dial 3 and from the hands. The disk 7 is provided around its margin with a plurality of openings 8. These openings preferably extend entirely through the disk and are preferably entirely screw threaded. Preferably there are twenty-four of these openings corresponding to the hours and half hours of the day or night. There may, however, be more or less of these openings as desired. For instance, if the clock is a twenty-four hour clock, there will be 48 of these openings corresponding to the twenty-four hours and the half hours. If, however, the clock is a twelve hour clock, then there will be 24 openings as above stated.

Preferably the face of the disk 7 is provided with a series of numerals placed adjacent to the perforations 8 and indicating the hours of the day, as for instance from one to twelve. Pins 9 and 10 are provided insertable into the openings 8. The pin 9 is preferably screw threaded at its extremity so that when inserted in any one of the screw threaded openings 8, the pin will project outward from the face of the disk 7. The pin 10 is provided at one extremity with a head 11, and the pin is screw threaded adjacent to the head so that the pin may be inserted entirely through the disk 7 in the position shown in Fig. 5, and the screw threaded portion of the pin engaged with the disk so that the shank of the pin will project behind the disk 7.

Pivotally supported within the interior of the casing 2, and as shown upon a cross piece 12, are a pair of detents designated 13 and 14. The detent 14 is spaced from the detent 13 and the upper end of the detent 14 extends upward and over the face of the disk 7 and in position where it may be engaged by a pin 9 disposed in any one of the holes 8. The detent 13 also extends over the rear face of the disk and overlaps the margin thereof in position to be engaged by the pin 10. The other extremities of the detents 13 and 14 are formed, one with a hook-shaped terminal end 15 and the other with a rectangular recess at its extremity providing a shoulder 16. The member 14 is preferably formed with the hook-shaped end 15 while the member 13 is provided with the shoulder 16. The extremity of the member 14 is beveled as at 17 for a purpose to be later described. Retractable springs 18

are supported at one end in any suitable manner and at their other ends engage, each with one of the detents 13 and 14. Stops 19 are disposed so as to support the detents in the position shown in Fig. 1 against the force of the springs and yet permit the springs to be moved away from the stops and against the force of the springs by means of the pins 9 and 10.

Mounted in the other end of the casing 2 is a double knife switch. One blade of this knife switch is designated 20 and the other blade 21. These blades are mounted upon a common pivot rod 22, and surrounding this rod are coiled springs 23 and 24, the spring 23 acting to force the blade 20 toward the end of the casing and the spring 24 acting to force the blade 21 away from the end of the casing or in a reverse direction to the blade 20.

Supported in any suitable manner in the path of movement of the blades 20 and 21 are the spring contact jaws 25 and 26; the jaws 25 engaging the blade 20 when it is forced downward and the jaws 26 engaging the blade 21 when it is forced downward. The pairs of contact jaws 25 and 26 are electrically connected to each other and the pair of jaws 25 is electrically connected through the blade 20 to a line wire 27, while the blade 21 is electrically connected through the blade 21 to a line wire 28. It will thus be seen that unless both blades are in electrical engagement with the jaws 25 and 26, the circuit will not be completed through the line wires 27 and 28.

In the illustration of my invention, the switch blades and the jaws are shown as mounted upon a slanting brace 29, but it will be understood that they may be mounted in any suitable manner. For the purpose of placing the blades 20 and 21 in proper operative position, I provide the actuating rods 30 and 31, the rod 30 being operatively connected to the blade 20, while the rod 31 is operatively connected to the extremity of the blade 21. The engaging extremities of the blades 20 and 21 and the rods 30 and 31 are insulated from each other. Each of the rods 30 and 31 is provided at its end with a suitable terminal forming a handle whereby the rod may be actuated. When the rod 31 is pulled down, the blade 21 will be drawn into engagement with its contact jaws 26 against the force of the spring 24. When the rod 30 is pushed upward, the blade 20 is forced out of engagement with its contact jaws 25 against the force of the spring 23.

Attached to the blade 20 and extending out therefrom is a rod 32 adapted to engage with the detent 14, while pivotally attached to the blade 21 is a rod 33 adapted for engagement with the detent 13. Both of the rods 32 and 33 have pivotal engagement with the blades 20 and 21 but are insulated there-

from. The extremity of the rod 32 is formed with a hook-shaped terminal end 34 which is adapted to engage with the hook-shaped terminal end of the detent 14. The rod 32 is yielding or resilient so that it may ride over the incline 17 on the extremity of the rod 14 and snap into engagement with the hook 15. Preferably the hooked terminal end of the rod 32 extends laterally in one direction, while the hook-shaped terminal end of the detent 14 extends laterally in the same direction, as illustrated in the elevation, Fig. 2. The terminal end of the rod 33 is laterally bent as at 35 so as to provide a relatively large surface to abut against the shoulder 16 on the extremity of the detent 13. Preferably the rods 32 and 33 pass through a wooden partition designated 36, the partition forming a guide for these rods 32 and 33. It is obvious, however, that the internal arrangement of the casing 2 may be varied in many ways.

The operation of my invention is as follows: When it is desired to set the device so as to close a certain circuit at a certain time, the circuit will remain closed for a definite period and then be broken. The pin 9 is to be set upon the front face of the disk 7 in any desired one of the openings or holes 8. If for instance it is desired that the circuit shall be completed at six o'clock, the pin is set in the hole adjacent to the figure 6. The pin 10 is to be placed upon the reverse side of the disk in any desired opening 8 therein, and if it is desired that the circuit should be broken, say at half past ten, the pin is set in the half past ten hole. The parts being arranged as described, the rod 31 is pulled, thus drawing the knife blade 21 into engagement with its contacts. The rod 30 is forced upward, thus forcing the blade 20 out of engagement with its contact jaws. The downward pull upon the rod 33 caused by the downward movement of the switch blade 21, causes the extremity of the rod 33 to ride along the face of the detent 13 until the extremity snaps into the recess at the lower extremity of the detent and brings the extremity of the rod 33 in abutting engagement with the shoulder 16. The upward movement of the blade 20 causes the rod 32 to move inward until its hooked end engages over the hooked end 5 of the detent 14. Under these circumstances it will be seen that the detent 14 will hold the rod 32 and the switch blade 20 in their raised position against the action of the spring 23, and that the shoulder 16 will hold the rod 33 and the blade 21 in their depressed position against the action of the spring 24. The parts will remain in this position until the pin 9 upon the face of the disk 7 strikes the upper extremity of the detent 14. This will turn the detent upon its pivot and release its hooked termi-

nal end 15 from engagement with the hooked terminal end of the rod 32, whereupon the spring 23 will cause the knife blade 20 to engage its contact jaws and the circuit will be completed through the line wires 27 and 28. The circuit will remain completed until in the course of time, the disk 7 has rotated to a sufficient degree to bring the pin 10 into contact with the detent 13. When this occurs, the detent will be turned upon its pivot as before described, the shoulder 16 will slip off from its engagement with the extremity of the rod 33 and the spring 24 will cause the blade 21 to move out of engagement with its contact jaws 26, thus breaking the circuit through the line wires 27 and 28. The device may be again set for a like movement by pushing upward on the rod 30 and pulling downward upon the rod 31.

It will be of course understood that when I refer to the rod 31 and the rod 30 as being pushed upward or downward, I am describing the motion of these rods when the device is arranged as illustrated. It will be obvious, however, that the casing might be arranged upon its side equally well, in which case the rods would be pushed laterally. While I have shown what I believe to be a very effective form of my invention I do not wish to be limited thereto as various minor changes might be made therein without departing from the spirit of the invention. The device is very simple, has very few parts, the clockwork is of an ordinary character, and there is nothing which can readily get out of order.

What I claim is:

1. An electric time switch including a pair of switch blades, contact members with which they electrically coact, means for urging one blade into and the other blade out of engagement with the corresponding contact member, a clock actuated disk provided with a series of perforations upon its margin, pins shiftable into any of said perforations, links extending upward from the switch blades, and pivoted members, one for each of said links engaging the said links when in one position to hold the blades in operative position against the force of the urging means, said pivoted members extending into the path of movement of the pins whereby the pivoted members may be shifted out of engagement with the links.

2. In an electric time switch, the combination with a pair of switch blades, contact members, one for each switch blade, means for yieldingly urging one of said switch blades out of engagement with its corresponding contact member and the other blade into such engagement, of a clock actuated disk provided with a series of perforations upon its margin, a pair of pins shiftable into any of said perforations, links piv-

otally connected to the respective switch blades and extending toward said disk, one of said links having a hook-shaped terminal end, and pivoted latches mounted above the links, the upper ends of the latches extending into the path of movement of the said pins, one of said latches being formed with a shoulder engaging the end of one of said links to prevent an upward movement thereof, the other latch being provided with a hook engaging the hook-shaped terminal end of the other link and preventing any downward movement thereof when so engaged.

3. In an electric time switch, the combination with a pair of switch blades, a pair of corresponding contact members and yielding means for urging one of said blades in engagement with its contact member and the other of said blades out of such engagement, of clock mechanism including a clock actuated disk provided with a series of perforations on its margin, a pair of pins shiftable into any of said perforations, one of said pins projecting from one side of the disk and the other pin projecting from the other side of the disk, links pivoted to the switch blades and extending upward therefrom, a guide for said links, latches pivoted intermediate their ends, the upper ends of the latches extending into the path of movement of the pins on the disk, the lower end of one of said latches being formed with a shoulder engaging one of said links to prevent an upward movement thereof and of the corresponding contact member, the other of said latches having a hook-shaped terminal end engaging with a hook-shaped terminal end on the corresponding link to prevent a downward movement of the latter, and a spring adapted to urge the latches out of operative position.

4. In an electric time switch, the combination with a pair of switch blades, contact members, one for each of said switch blades, means yieldingly urging one of said switch blades out of engagement with its corresponding contact member and the other blade into such engagement, of a clock-actuated disk provided with a series of perforations upon its margin, a pair of pins shiftable into any of said perforations, one of said pins projecting from one side of the disk and the other pin projecting from the other side of the disk, and means disposed in the path of the pins and releasable thereby for holding the first named blade out of engagement with its contact member, and the other of said blades in engagement with its contact member.

5. In an electric time switch the combination with a pair of switch blades, a pair of corresponding contact members and yielding means for urging one of said blades into engagement with its contact member and

the other of said blades out of such engagement, of clock actuated mechanism including a disk provided with marginal perforations, pins mounted on the disk in any one of said perforations and projecting from
5 opposite sides of the disk, a pair of yielding members for holding the switch blades, one out of engagement with its contact member against the force of the means urging it
10 into such engagement and the other member holding the second named blade into engagement with its contact member against

the force of the corresponding urging means, said yielding holding members being disposed, each in the path of one of said 15 pins and being actuated by said pins to successively release said blades.

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

DEAN A. CATO. [L. S.]

Witnesses:

SANA SLENKER,
C. G. CATO.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."