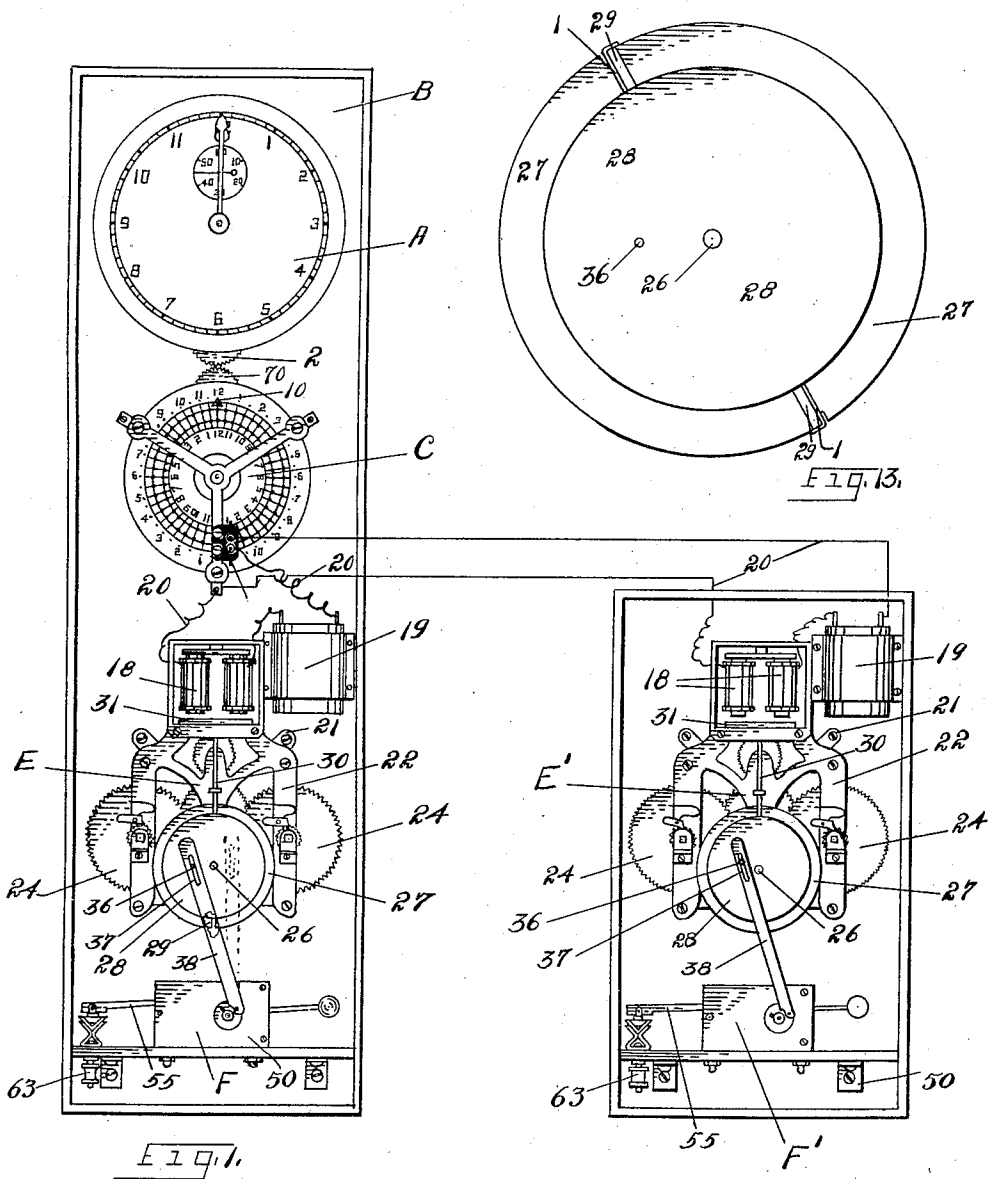


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TIME CONTROLLED GANG SWITCH.
APPLICATION FILED SEPT. 30, 1912.

1,066,204.

Patented July 1, 1913.

3 SHEETS-SHEET 1.



Witnesses:

F. H. Thomas.
W. R. Bellman

John Greene and
William G. Saddleir
Inventors

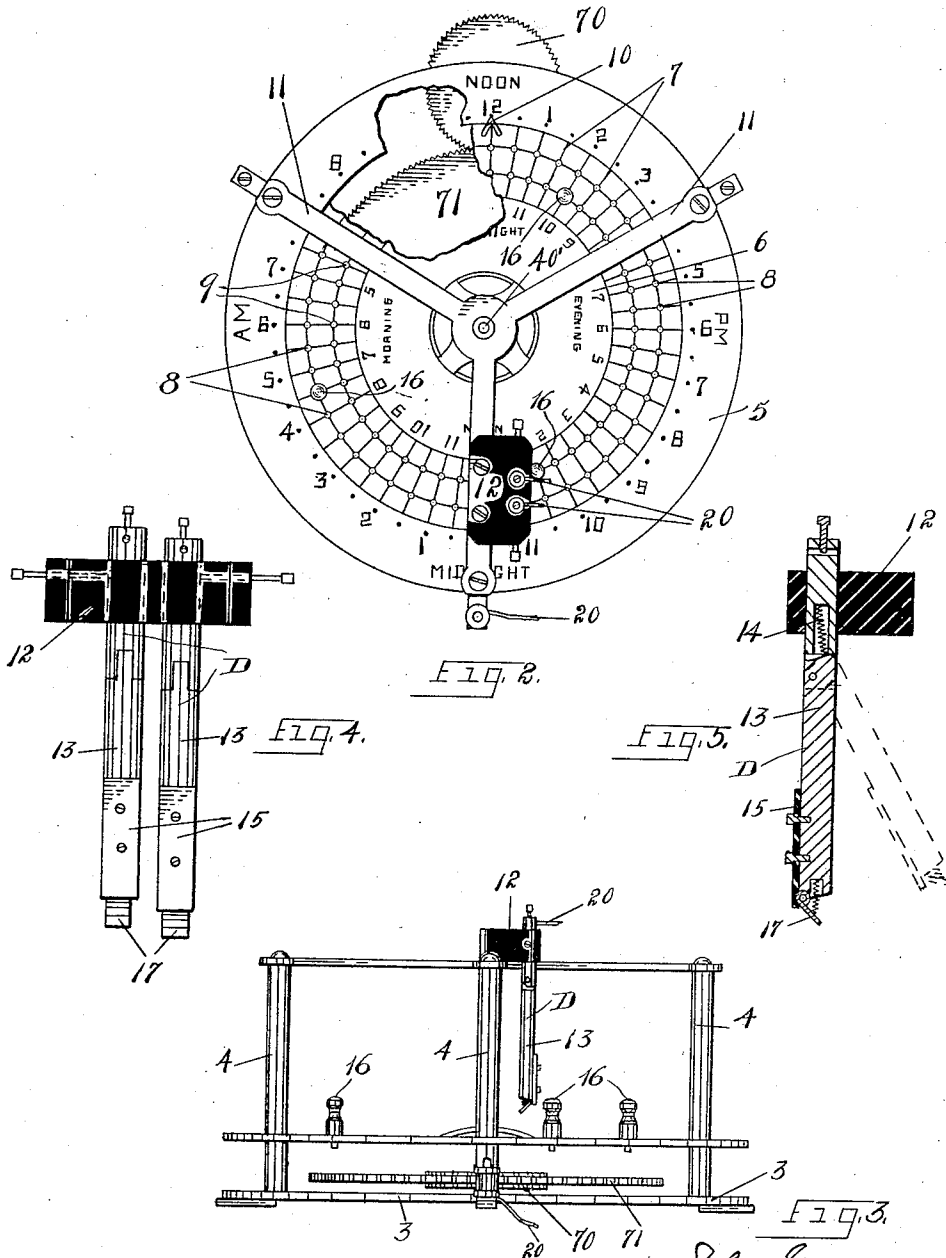
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3 SHEETS-SHEET 2.



Witnesses:

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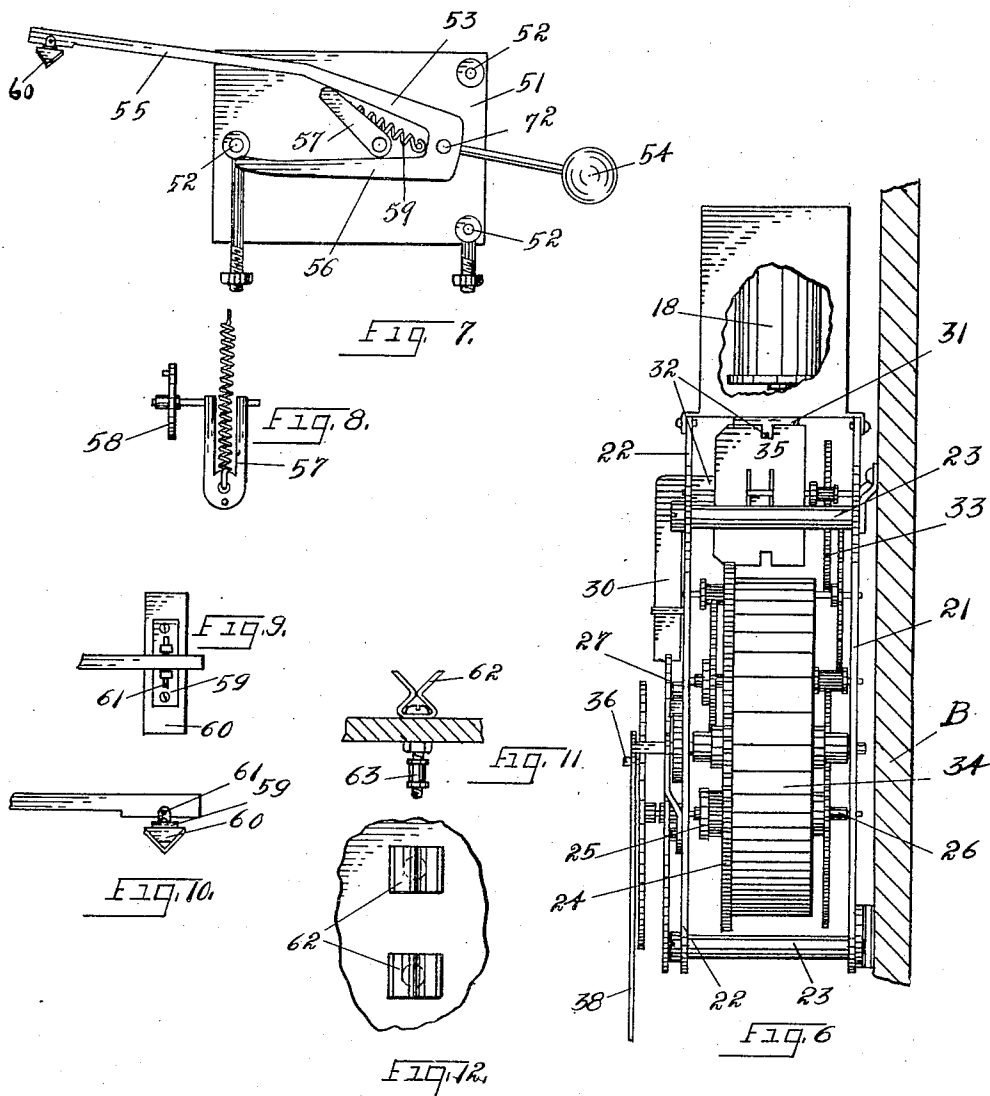
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John Greene and
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UNITED STATES PATENT OFFICE.

JOHN GREENE AND WILLIAM G. SADLEIR, OF SALT LAKE CITY, UTAH.

TIME-CONTROLLED GANG-SWITCH.

1,066,204.

Specification of Letters Patent.

Patented July 1, 1913.

Application filed September 30, 1912. Serial No. 723,228.

To all whom it may concern:

Be it known that we, JOHN GREENE and WILLIAM G. SADLEIR, citizens of the United States, residing at Salt Lake City, in the county of Salt Lake and State of Utah, have invented certain new and useful Improvements in Time-Controlled Gang-Switches, of which the following is a specification.

Our invention relates to time controlled electric switches, and has for its object to provide a device operated by and in unison with a clock, whereby a switch, or any number of switches, may be operated to make or break an electric circuit, at any hour of the day; and which is not a part of the time mechanism or so connected therewith as to injure the clock or impair its correctness. These objects we accomplish with the apparatus illustrated in the accompanying drawings in which similar letters of reference indicate like parts throughout the several figures, and as described in the specification forming a part of this application and as pointed out in the appended claims.

Figure 1 is a front view in elevation, showing two switch units. Fig. 2 is an enlarged front elevation of the switch dial, parts cut away. Fig. 3 is a side view of the same. Fig. 4 is an enlarged side elevation of two spring contact rods. Fig. 5 is a longitudinal section through one of said contact rods. Fig. 6 is a side elevation of the lever controlling and moving mechanism, parts cut away. Fig. 7 is a front view of the contact lever with front plate removed. Fig. 8 is a plan view of the lever moving rock-shaft and spring. Fig. 9 is a plan view of the wrist plate and pin, and a portion of the contact lever. Fig. 10 is an end elevation of the same. Fig. 11 is an elevation of one of the contact posts, and a portion in section of the support therefor. Fig. 12 is a plan view of the same. Fig. 13 is an enlarged front elevation of the stop disk and crank disk.

It is often desirable to turn on electric energy at night and at other times during the day to be used for a short time only; and in order to use said energy for a limited time and to turn it off at the end of that time, personal attention is usually required to operate the switch to make and to break the circuit. In other places a number of such circuits are needed and used, so much so that an attendant's entire time is required to operate the switches. Our invention is to

supply a switch or any number of switches to turn on or off electric currents at any predetermined time in the twenty-four hours of the day, and in which the timing part of the apparatus may be placed at such distance from the switch mechanism that any jar or movement thereof will not affect or injure the time mechanism, said mechanisms coacting to produce the desired result. Also in our apparatus one of our time mechanisms will regulate almost any number of individual switch units.

The preferred form of our apparatus is shown in the drawings and consists of an ordinary eight day clock A mounted in a case B. A gear wheel 2 is journaled in the frame of said clock and the teeth of said gear wheel mesh with a gear wheel, (not shown) that is secured on the hour hand shaft of said clock, and with an idler gear 70, which is journaled in a switch dial C. Said dial C is mounted in said case B adjacent said clock and consists of a base plate 3, and standards 4. To the intermediate portion of said standards 4 is fastened an annular hour disk 5, having the numbers 1 to 12 placed clockwise thereon in a circle with 12 and 12 at the top and bottom, and with the numbers 1 to 11 consecutively placed in a circle therebetween. Over the top number 12 the word Noon is printed and below the bottom number 12 the word Midnight. Adjacent the number 6 to the right, the letters P. M. are placed and adjacent the number 6 to the left the letters A. M. are placed. Concentrically within said disk 5 is mounted the adjustable rotative disk 6. Said disk 6 has forty-eight radial lines thereon equally spaced apart, and in said lines 7, holes 8 are provided in a circular row, concentric with the outer edge of said disk 6. Any number of rows of said holes may be provided, two being shown in the drawings, a row for each of the switch units which are described hereinafter. The outer row of holes are numbered 8 and the inner ones 9 and their use and purpose will be explained hereinafter. Within the circle formed by said holes 9 the numbers 1 to 12 are placed in a circle, reading from 12 to 1 and from 12 to 1. Each of said numbers being in alinement with one of said lines 7 and also the word Noon is printed adjacent one of the numbers 12 and the word Midnight adjacent the other number 12. The word Evening is printed adjacent the figure

6 to the right and the word Morning adjacent the figure 6 to the left. For convenience in setting the dial and the clock in time with each other a pointer 10 is fastened on said disk 6 in alinement with the word Midnight. On the top of said standards 4 are fastened the braces 11, radially disposed and forming a top bearing at their inner ends for a central shaft 40. On the lower portion of said shaft 40 is secured the dial gear 71 which meshes with said idler gear 70 and by which motion is imparted to said disk 6. On one of said braces 11 a block 12 made of insulating material is secured. In said block 12 are fastened the contact rods D each consisting of a severed and hingedly connected metal bar 13.

Secured to the two portions of the bar 13 is a spring 14, by means of which said bar is normally held straight, but may be bent on its hinge as shown in dotted lines in Fig. 5. In said holes 8 and 9 detachable contact plugs 16 are to be inserted. On the lower portion of said metal bar 13 is fastened the insulating plate 15, provided thereon to prevent an electrical contact when said bar 13 first strikes against said plugs 16. Hinged to the lower edge of each of said bars 13 is the spring held contact plate 17 which is provided thereon to complete the electrical circuit but only for such a short period of time as will enable a battery or other source of electrical power to energize a magnet or solenoid 18, which is in the electrical circuit embracing a source of electric energy, that shown being a battery 19. Said battery 19, magnets 18, contact post D and the disk 6 are electrically connected by the wires 20 when the circuit is completed by the contact of the plate 17 with one of the plugs 16. Adjacent said magnets 18 is a lever controlling and moving mechanism E consisting of a base plate 21 and top plate 22, rigidly spaced apart and held in place by the standards 23. Mounted between the said top plate 22 and the base plate 21 are the gear wheels 24, the teeth of both of which mesh with the pinion 25, which is mounted on the shaft 26. Said gear wheels are run by a spring 34 secured on the shaft of each. On said shaft 26 is mounted and rotated thereby the stop disk 27 and the crank disk 28. In the peripheral edge of the said stop disk 27 are cut the slots 29 diametrically opposite and in which a bar 30 is made to engage when contiguous thereto. Within each of said slots 29 is fastened a spring 1, normally closing the opening to said slot. Said bar 30 is moved by the said magnets 18 by having the armature 31 thereof fastened to said bar 30, and when said magnets 18 are energized said bar is withdrawn from its engagement within said slots 29. When so withdrawn said disk 27 is free to rotate, with its axis, said

shaft also rotating. An arm 32 of said bar 30 engages the fan 35 which is connected with a fly wheel 33 of said lever moving and controlling mechanism E. Intermeshing gears similar to a clock train connect said fly wheel 33 and said shaft 26. Motion imparted to said shaft 26 by the spring 34 will be controlled by said bar 30, and when said shaft 26 is rotated the disks 27 and 28 will be revolved. In the face of said crank disk 28 is fitted the crank pin 36 which is made to operate in a slotted opening 37 that is cut in a pitman 38. Said pitman is pivoted on a disk crank 58. Adjacent said lever controlling and moving mechanism E is mounted the lever case F, consisting of a front plate 50 and a back plate 51, spaced apart and securely held in place by the standards 52 which are T-shaped and have depending lugs by which said lever case is secured in place. Pivoted to the back plate 51 is the V-shaped lever 53, having a weight ball 54 fastened on the apex end thereof to equalize the weight of an extended arm 55. Another arm 56 of said lever is extended to engage one of said standards 52 to limit the upward throw of said lever 53. Journalled in said plates 50 and 51 is a rock-shaft 57, having one end extended outwardly through said plate 50 and on which a disk crank 58 is fastened. Said rock-shaft is placed between the arms of said lever 53 and one end of a spring 59 is secured to said rock shaft 57 and the other end is fastened to the said lever 53 opposite the apex thereof. On the free end of said lever arm 55 is pivoted a wedge-shaped contact 60 by means of a wrist-plate 59 and wrist pin 61. Said wedge-shaped contact is made of metal and when operated is to be brought in contact with V-shaped metal contact posts 62, each of which is formed to engage the full face in cross section of said wedge-shaped contact 60, thus enabling us to secure a wedge contact with the minimum of friction. The wires carrying the current to be controlled are secured to the binding posts 63.

In the operation of our apparatus the said switch dial C is set in time with the clock by turning the said disk 6 until the said pointer 10 points to the same number on the hour disk 5 that the hour hand of the clock indicates is the time of the day, that shown being practically 12 o'clock. Fractions of the hour may be shown by other radial lines 7, half hours being all that are shown in the drawings. This adjustment sets the clock and switch dial together and wishing to turn on an electric current at four o'clock p. m. one of the contact plugs 16 is inserted in one of the holes 8 in the radial lines 7 which is in alinement with the number 4 P. M. on said disk 6. If the current is required for seven hours' period of time another contact plug

16 is likewise inserted in the hole 8 opposite the number 11 P. M. on said disk 6. The running of said clock A until 4 o'clock will by means of the gears 70 and 71 turn said disk 6 until the said first placed contact plug 16 will engage the insulating plate 15 on one of said bars 13. A continuation of the movement of said clock A will rotate said disk 6, and said bar 13 will be bent on its hinge and assume somewhat the position shown in dotted lines in Fig. 5. In this position said bar 13 will slide across the top of said contact plug 16, and the metal plate 17 will be in touch with said contact plug 16 for an instant. This will complete the electric circuit over the said wires 20 and the magnets 18 will be energized and the armature 31 will draw the bar 30 from the slot 29. The spring 1 will close the entrance to said slot 29 until the disk 27 is rotated. The arm 32 will be raised from its engagement with said fan 35 and the mechanism E will be set in motion. The disks 27 and 28 will be rotated and the upper end of said pitman 38 will be moved to the position shown in dotted lines in Fig. 1. When the said crank pin 36 moving as it does in the slotted opening 37 reaches the bottom of said slot the pitman 38 will move the rock-shaft 57 to the position shown in Fig. 7, and the said rock-shaft 57 will by contacting with said arm 56 move the lever 53 on its fulcrum pivot 72, and the arm 55 will be depressed to the position shown in Fig. 1. This will bring the wedge-shaped contact 60 within the walls of the V-shaped contact post 62 and complete the electrical circuit. The lever controlling mechanism E will continue in motion until the other of said slots 29 is adjacent the lower end of said bar 30, which bar will strike the end of said spring 1, and move it from over said slot 29 and said bar which has been sliding on the peripheral edge of said disk 27, will drop into said slot and the arm 32 will engage the said fan 35 and stop said mechanism E. When said clock A has rotated said disk 5 until said contact posts D are in engagement with the other of said contact plugs 16 which will occur at 11 o'clock p. m. said mechanism E will be again set in motion and thereby the said lever arm 55 will be raised, the switch operated and the circuit broken. If said current has been used for lighting purposes the lights will have been turned on at 4 o'clock and remained on until 11 o'clock p. m. Another current may be controlled by similar contact plugs 16 being inserted in said holes 9 and another set of wires 20 connected with the other of said contact posts D, and in circuit with another similar lever controlling mechanism E' and lever case F' with the connected parts.

Having thus described our invention we

desire to secure by Letters Patent and claim:—

1. In an apparatus of the class described the combination of a clock; a switch dial geared therewith, consisting of a frame; a shaft journaled therein; a disk mounted in said frame concentric with said shaft and having numbers 1 to 12 placed clockwise thereon; another disk concentrically within said first mentioned disk and secured on said shaft and rotating therewith; a plurality of holes in said last mentioned disk concentrically placed in rows forming circles; severed and hingedly connected contact posts mounted on said frame; detachable contact plugs in said holes; a source of electric current; magnets in electrical connection with said source of current; wires connecting said magnets and said source of current with said switch dial; a bar fastened to the armature of said magnets and moved thereby; a spring-moved train of gears journaled in another frame adjacent said magnets; another shaft rotated by said gears; a disk mounted on said shaft and rotative therewith, having open slots in the peripheral edge adapted to receive one end of said bar when adjacent thereto; springs fastened on said last mentioned disk adapted to close said slots; a lever case mounted adjacent said disk; a V-shaped lever pivoted in said case; a rock shaft mounted in said lever case between the arms of said lever; a crank disk secured on said rock shaft; a pitman connecting the said disk having the open slots therein with the crank disk; a wedge shaped contact pivoted on the end of said V-shaped lever; and V-shaped contact posts adjacent said wedge shaped contact.

2. In an apparatus of the class described a switch dial connected by gears with a clock and mounted in a frame; a shaft journaled in said frame; a disk mounted on said shaft and rotative therewith; a plurality of holes placed in rows concentrically on said disk; severed and hingedly connected contact posts mounted on said frame; detachable contact plugs in said holes; a source of electric current; magnets in electrical connection with said source of current; wires connecting said magnets and said source of current with said frame; a train of gears mounted adjacent said magnets made to rotate by means of springs; a disk rotated by said gears; a bar moved by said magnets and adapted to engage said last mentioned disk; a V-shaped lever pivoted adjacent said last mentioned disk; a rock shaft mounted between the arms of said lever; a crank secured on said rock shaft; a pitman connecting said last mentioned disk and said crank; a wedge shaped contact pivoted on one arm of said V-shaped lever; and V-shaped contact posts adjacent said wedge shaped contacts.

3. In an apparatus of the class described the combination of a switch dial mounted in a frame and connected by gear wheels with gears of a clock; detachable contact plugs in
 5 said dial; severed and hingedly connected contact posts fastened on said frame; a spring held contact plate hinged to the lower end of each post to make and break an electric circuit when drawn across the top of
 10 said contact plugs; wires connecting said frame and said dial with electrically energized magnets; a bar fastened to the armature of said magnets and moved thereby; a train of intermeshing gears journaled in an
 15 other frame adjacent said magnets; springs to rotate said gears; a disk connected with said last mentioned gears having open slots in the peripheral edge thereof to receive the end of said bar; a V-shaped lever pivoted
 20 adjacent said last mentioned disk; a rock shaft pivoted between the arms of said lever; a crank secured on said rock shaft; a pitman having an elongated slot therein connecting said crank and said last mentioned
 25 disk; a wrist plate pivoted on one arm of said V-shaped lever; a wedge shaped contact fastened to said wrist plate; and V-shaped contact posts adjacent said wedge shaped contact.

4. In a device of the class described the combination of a frame; a shaft journaled therein and connected by gears with a clock; a dial mounted in said frame; a disk secured on said shaft concentrically within said dial and provided with rows of holes in concentric circles thereon; contact plugs detachably fitted in said holes; severed and hingedly connected contact posts secured on
 35 said frame; contact plates hinged on the lower end of said posts adapted to engage the top of said contact plugs when drawn thereover; a source of electric energy; magnets connected with said source of energy; a depending bar fastened to the armature of said magnets; a spring rotated disk mounted
 40 adjacent said bar and provided with open slots in the edge thereof; a lever pivoted adjacent said disk; and a pitman connecting said disk and said lever.

In testimony whereof we have affixed our
 45 signatures in presence of two witnesses.

JOHN GREENE.
 WILLIAM G. SADLEIR.

Witnesses:
 SAM RANEY,
 W. R. WILLIAMS.