

Sept. 20, 1932.

J. E. KUYKENDALL

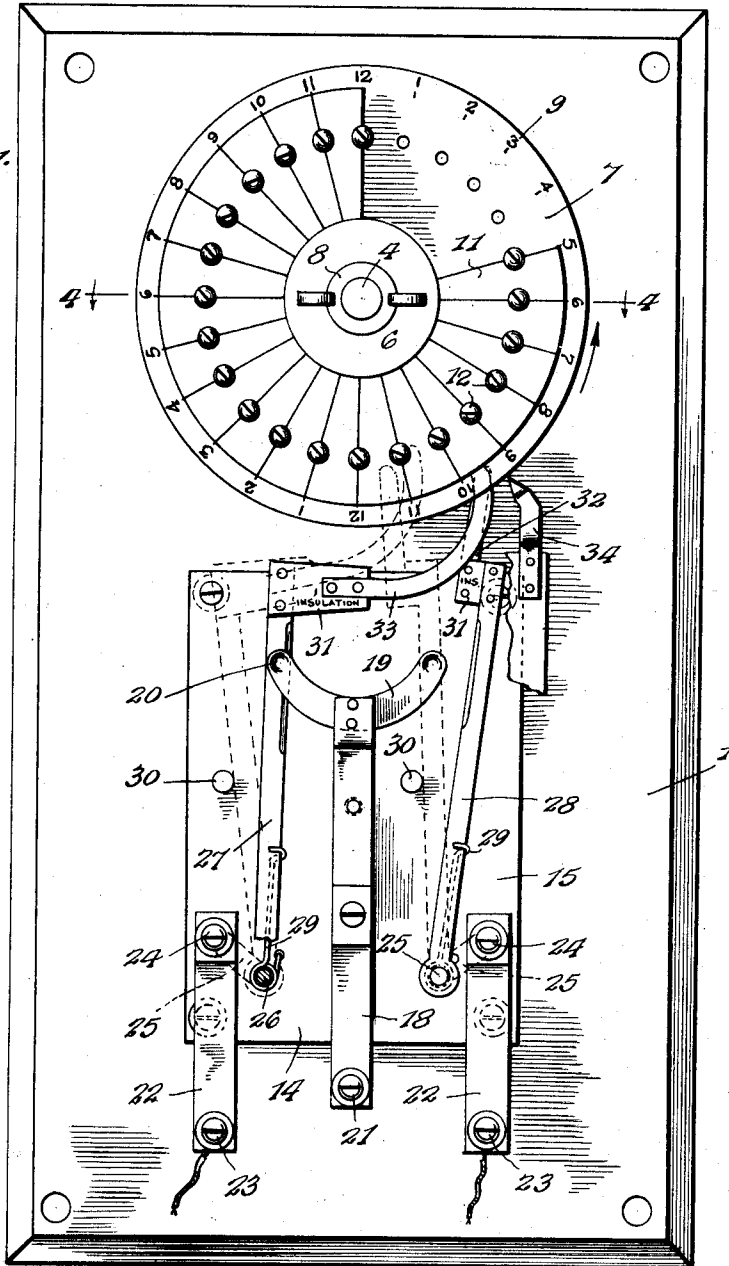
1,878,637

TIME SWITCH

Filed Aug. 30, 1930

3 Sheets-Sheet 1

Fig. 1.



Inventor

J. E. Kuykendall.

By

Lacey Lacey,

Attorney

Sept. 20, 1932.

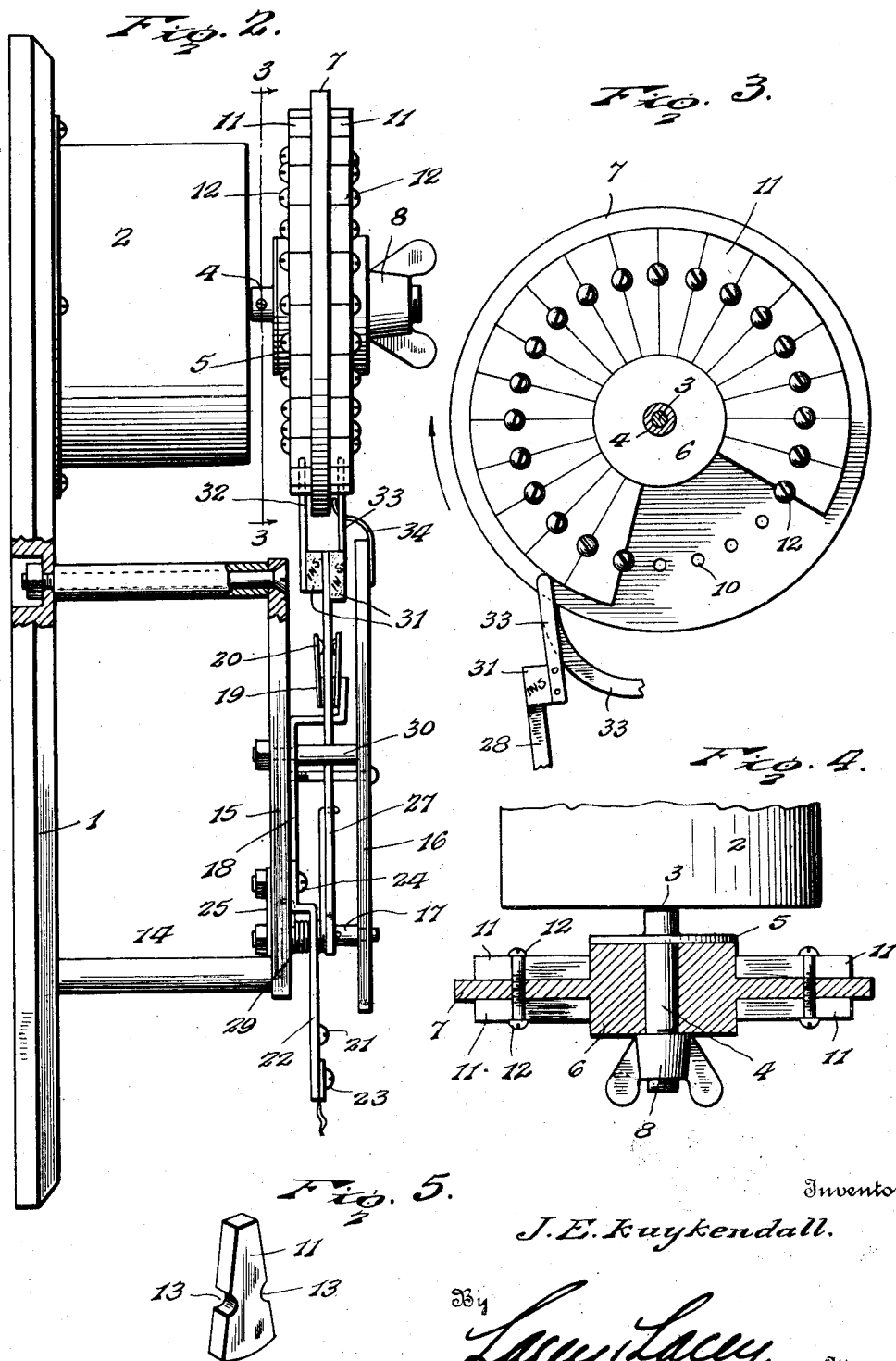
J. E. KUYKENDALL

1,878,637

TIME SWITCH

Filed Aug. 30, 1930

3 Sheets-Sheet 2



Sept. 20, 1932.

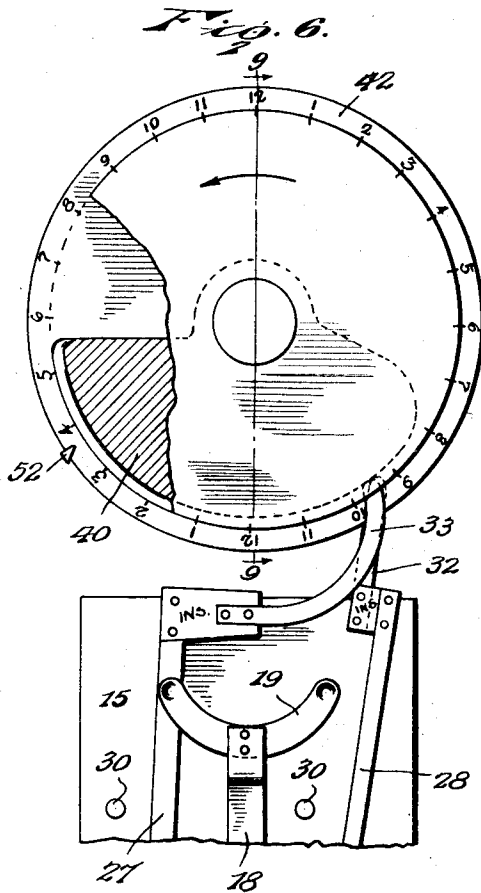
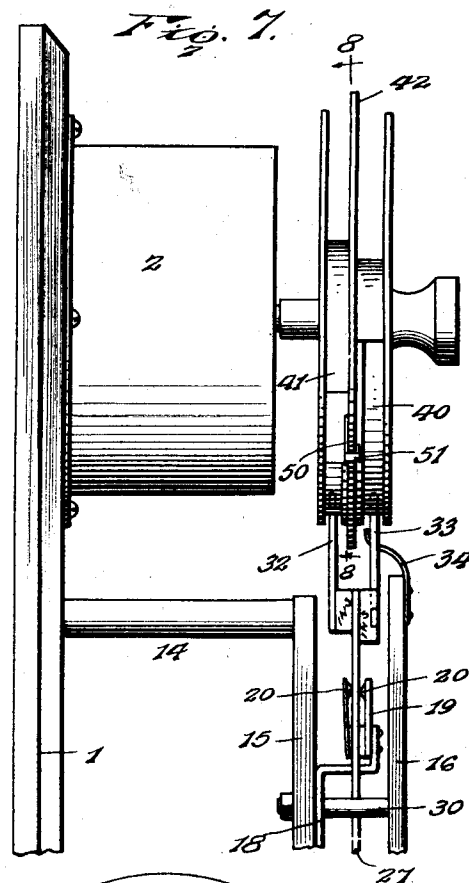
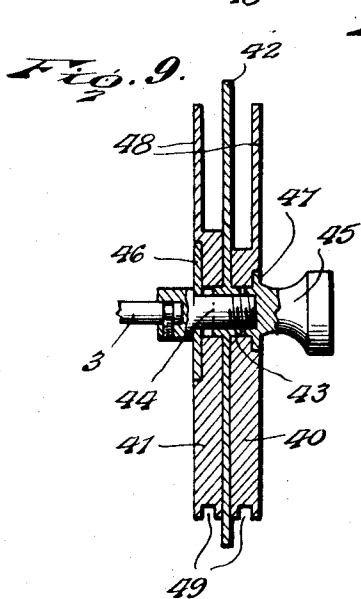
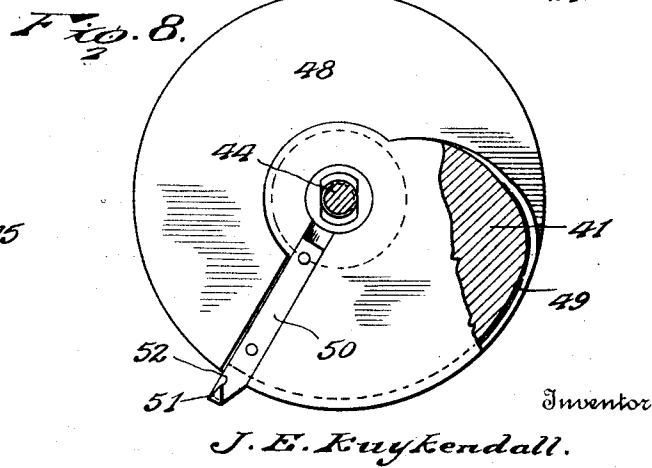
J. E. KUYKENDALL

1,878,637

TIME SWITCH

Filed Aug. 30, 1930

3 Sheets-Sheet 3



Inventor
J. E. Kuykendall.
By *Lacey Lacey* Attorneys

UNITED STATES PATENT OFFICE

JOSEPH E. KUYKENDALL, OF SAN ANTONIO, TEXAS

TIME SWITCH

Application filed August 30, 1930. Serial No. 478,955.

This invention is an automatic switch for closing electric circuits and the object of the invention is to provide a device which will be very simple in construction and efficient in operation.

The invention is illustrated in the accompanying drawings and consists in certain novel features which will be hereinafter fully described and then more particularly defined in the appended claims.

In the accompanying drawings:

Figure 1 is a front elevation of a device embodying the invention.

Figure 2 is a side elevation of the same, partly broken away.

Figure 3 is a detail rear elevation of the controlling dial.

Figure 4 is a horizontal section on the line 4-4 of Figure 1.

Figure 5 is a detail view of one of the segments shown in the previously mentioned figures.

Figure 6 is a sectional elevation of a second embodiment of the invention.

Figure 7 is a side elevation of the same.

Figure 8 is a detail sectional elevation, the section being taken on the line 8-8 of Figure 7.

Figure 9 is a sectional view on the line 9-9 of Figure 6.

It may be noted that while the apparatus is illustrated in the accompanying drawings in a vertical position as a matter of convenience and will be described as in said position, it may be disposed in any position most convenient under given circumstances and will operate efficiently in all positions.

In carrying out the invention there is provided a panel or baseboard 1 which may be of any approved form and dimensions and may, if desired, be ornamented to any degree. At the upper end of this baseboard is a clock mechanism which may be of any well known or approved arrangement. Secured to the outer or front end of the shaft 3 of the clock is a stub shaft 4 which may be shouldered or provided with a back plate 5 whereby it will present an abutment for a hub member 6, said hub member being of insulation and being integral with or rigidly secured to a dial

7 which, when the device is in operation, will rotate with the shaft, a wing nut 8 being fitted upon the threaded extremity of the stub shaft and being turned home against the hub member, as will be understood upon reference to Figure 4, whereby the hub member and the dial will be clamped firmly against the abutment 5 and thereby secured to the shaft. Around the margin of the dial 7 are inscribed numerals, indicated at 9, which may extend from 1 to 24 or be disposed in two series, each running from 1 to 12, these numerals being intended to designate the successive hours and the dial being intended to make one complete revolution every twenty-four hours. Disposed concentrically about the hub, threaded openings or sockets 10 are formed in the dial and disposed against the front and back faces of the dial are segments 11 of insulation which are held in place by cap screws 12 inserted through notches 13 formed in the meeting edges of the segments and engaged in the openings or sockets 10 in the dial, as clearly shown in Figure 4, whereby the segments will be clamped to the dial by the heads of the screws in an obvious manner. The segments are so proportioned that each segment will cover the area on the dial between two successive numerals 9, and the sockets 10 and the screws 12 engaged therein are disposed on radial lines of the dial leading to the respective indicator numerals. The contact members or movable switch arms are controlled by the segments 11, riding upon the peripheral edges of the segments when the segments are in contact and swinging beyond the peripheral line of the segments when the segments are removed. It will, therefore, be evident that by removing selected segments, the switch arms may be made to operate at desired times and consequently the making and breaking of the electric circuits will be automatically effected.

Mounted upon the baseboard 1 below the clock work and the dial is a frame 14 which includes a plate 15 of insulation supported in spaced relation to the baseboard, and a cover 16 also of insulation which is connected with the plate 15 by shouldered posts or bolts 17

and held in fixed spaced relation to the plate 15 by said bolts.

Secured upon the plate 15 and extending along the medial longitudinal line of the same is a conductor bar 18 of brass or other good conductive metal, and this bar 18 carries at its upper end a shallow U-shaped member 19 which consists of resilient arcuate plates provided at their extremities on their opposite faces with small projections or knobs 20 adapted to engage the movable switch arms, as will presently appear. It will be noted upon reference to Figure 2, that the upper end of the bar 18 is offset to support the member 19 in spaced relation to the plate 15 and said member 19 is secured at its center to the bar 18 so that its ends will be free to be engaged by the cooperating switch arm. It will also be noted that the lower end of the bar 18 extends beyond the end of the plate 15 and is equipped with a binding post or screw 21 so that an electric conductor may be attached thereto if desired. At each lower corner of the frame 14 a terminal strip 22 is secured, each strip being equipped at its lower end with a binding post or screw 23 whereby electric conductors may be attached to the terminals, as clearly shown in Figures 1 and 2. Each terminal is secured at its upper end by a screw 24 of good conducting material which passes through the insulating plate 15 and has a conducting strip or link 25 clamped to its back end, as shown in Figure 2. The screw or bolt 26 securing the opposite end of the respective link 25, passes through the insulated plate 15 and at its front end pivotally supports a switch arm 27 or 28. The respective switch arms are engaged by springs 29 which constantly urge them in one direction, and the movement of the switch arms under the influence of the respective springs is limited by stop pins 30 secured on the plate 15 at one side of the arms, as shown in Figure 1. Each of the switch arms 27—28 has secured at its upper end a block of insulation 31 and extending from the insulation is a lever member 32 or 33 which rides upon the rear or front series of segments 11, as shown in Figures 1, 2 and 3, and as will be readily understood. Upon reference to Figures 1 and 3, more particularly, it will be noted that the lever 32 extending from the switch arm 28 is a straight arm and cooperates with the rear series of segments 11, whereas the arm 33 is curved so as to extend laterally from the switch arm 27 and then extends upwardly to ride upon the peripheries of the front segments 11. The controlling dial, with the segments thereon, rotates in the direction indicated by the arrows in Figures 1 and 3, and in order that the levers 32 and 33 may be readily engaged and operated without binding or any tendency of the parts to bend or break, it is desirable that the levers be carried in ad-

vance of the vertical diameter of the dial in the direction of rotation.

At an upper corner of the cover 16 is secured an index pointer 34 which extends upwardly from the cover and is bent rearwardly so as to terminate close to the periphery of the indicator dial 7. The switch is set to operate at desired intervals by removing proper segments 11, as has been previously stated. After the segments have been removed, the dial is turned, the wing nut 8 being loosened, until the numeral 9, indicating the hour of the actual time, is alined with the pointer 34, after which the wing nut is turned home and the dial will then rotate with the clock. Assuming that the circuits controlled by the switch are to be broken between the hours of twelve and 5, the segments between the numerals 12 and 5 on the dial are removed, as shown in Figure 1, and when the end of the lever 33 is at any point in the space between the remaining segments, it will be swung into said space by the action of the cooperating spring 29 so that the arm 27 will be moved to the position shown in dotted lines in Figure 1, with the switch arm resting against the adjacent stop pin 30. When the rotation of the disc brings a segment against the end of the lever 33, the lever and corresponding switch arm will be returned to the full line position shown in Figure 1, against the action of the spring 29, and the switch arm 27 will then be engaged between and in contact with an adjacent protuberance 20 upon the contact member 19. The switch arm 27 is normally in the closed position in engagement with the member 19 while normally the switch arm 28 is in open position shown by the full lines in Figure 1, and is held in such position by riding upon the peripheries of the rear segments 11. If the switch is to be closed, say at 10 o'clock, the segments from 10 to 12 are removed and when the rotation of the dial brings the open space thus left adjacent the end of the lever 32, the lever will be swung into said space, as indicated by the dotted lines in Figure 1, by the action of the cooperating spring 29, the switch arm 28 being thereby caused to engage within the member 19 and close the circuit, it being noted that the switch arm 27 is normally in circuit closing position.

With contact wires attached to the terminals 22 as shown in Figure 1, the switch will operate as a single pole switch but if a conductor be attached to the screw or post 21, it may be utilized as a two-pole switch and effect remote control of lamps or other instrumentalities. The apparatus may be used wherever electrically operated mechanism is desired to be operated at regular intervals and for predetermined periods. The segments may be so arranged that the device will run for say, one hour, then be idle for

two hours, and then run for another hour, so that it may operate several times during a period of twenty-four hours and the switch is, therefore, adapted to a wide range of usefulness.

In Figures 6 to 9, I have shown a modification of the invention in which the switch arms and circuit closing contacts are of the same form as shown in Figures 1 to 5, and previously described. Instead of the segments employed in the first described form, however, I provide cams or eccentrics, indicated at 40 and 41, for operating the switch arms. These cams 40 and 41 are arranged at opposite sides of a central disc 42 which is provided at its margin with numerals indicating the hourly periods. The central dial 42 has a hub or sleeve member 43 which encircles a stub shaft 44 secured to the end of the clock arbor 3 and is threaded at its outer extremity to receive an internally threaded nut 45. A washer or abutment 46 is carried by the rear end of the stub shaft 44 and the cam 41 fits against the front face and the periphery of this washer, the center of the cam being mounted loosely upon the hub 43 of the central disc while the front cam 40 is loosely fitted about the front end of said hub 43 and about the rear end of the nut 45. The nut 45 is also provided with an annular flange or rib 47 which fits within a recess in the front face of the cam 40, as clearly shown in Figure 9, so that when the nut is turned home, the cams and the central disc will be firmly clamped on the stub shaft and will rotate therewith. It will be noted, particularly upon reference to Figure 9, that the cams are each provided with extensions 48 beyond their working portions and in the edges of their working portions have grooves 49 engaged by the ends of the switch arms, the grooves and said extensions serving to hold the switch arms against lateral oscillation and consequently maintaining them in engagement with the respective cams at all times. The front cam 40 may be adjusted readily to bring the advance end of its working edge into the proper position relative to the indicator disc or dial 42 so that the switch arm engaged thereby will be operated at the proper time and the cam will be properly shaped according to the duration of the working period and the number of working periods desired during the twenty-four hours. The cam 41 has secured thereto at its advance end, an indicator arm 50 which extends beyond the periphery of the cam and has a hook 51 at its free end arranged to engage around the edge of the indicator dial and terminating in a pointer 52 to cooperate with the numerals on the indicator dial whereby to correctly and accurately set the rear cam. The operation of the modified arrangement in opening and closing the circuits is identical with the first described form.

What is claimed is:

1. A time switch comprising a dial having marginal graduations, means whereby the dial may be rotated by a clock mechanism, segments detachably mounted on the front and rear faces of the dial with their sides abutting along diameters of the dial leading to the marginal graduations, fixed contacts below the dial, and movable switch arms mounted below the dial to cooperate with the fixed contacts and having their free ends extended beyond the periphery of the dial whereby to be engaged by the peripheral portions of the segments on the respective faces of the dial.
2. In a time switch, fixed contacts, switch arms pivotally mounted at opposite sides of said fixed contacts, yieldable means engaged with the switch arms and tending constantly to move them in one direction, means to limit the movement of the switch arms under the influence of said means, one of said arms being normally engaged with the fixed contacts, and levers carried by the switch arms and engageable with the segments to be moved thereby in opposition to said yieldable means.
3. In a time switch, fixed contacts, movable switch arms mounted at opposite sides of the fixed contacts and adapted to engage the same, a dial above the switch arms, means carried by said dial for operating the switch arms, means whereby the dial may be driven by clock mechanism, and an index element mounted adjacent the switch arms and cooperating with the dial to initially set the same.
4. In a time switch, a pair of fixed contacts, movable switch arms mounted at opposite sides of the fixed contacts and adapted to engage the same, a dial arranged above the switch arms, means whereby said dial may be rotated by a clock mechanism, cams disposed at the opposite sides of the dial and arranged to engage the ends of the switch arms and means at the center of the cams and the dial to clamp both cams to the dial.

In testimony whereof I affix my signature.

JOSEPH E. KUYKENDALL. [L. s.]