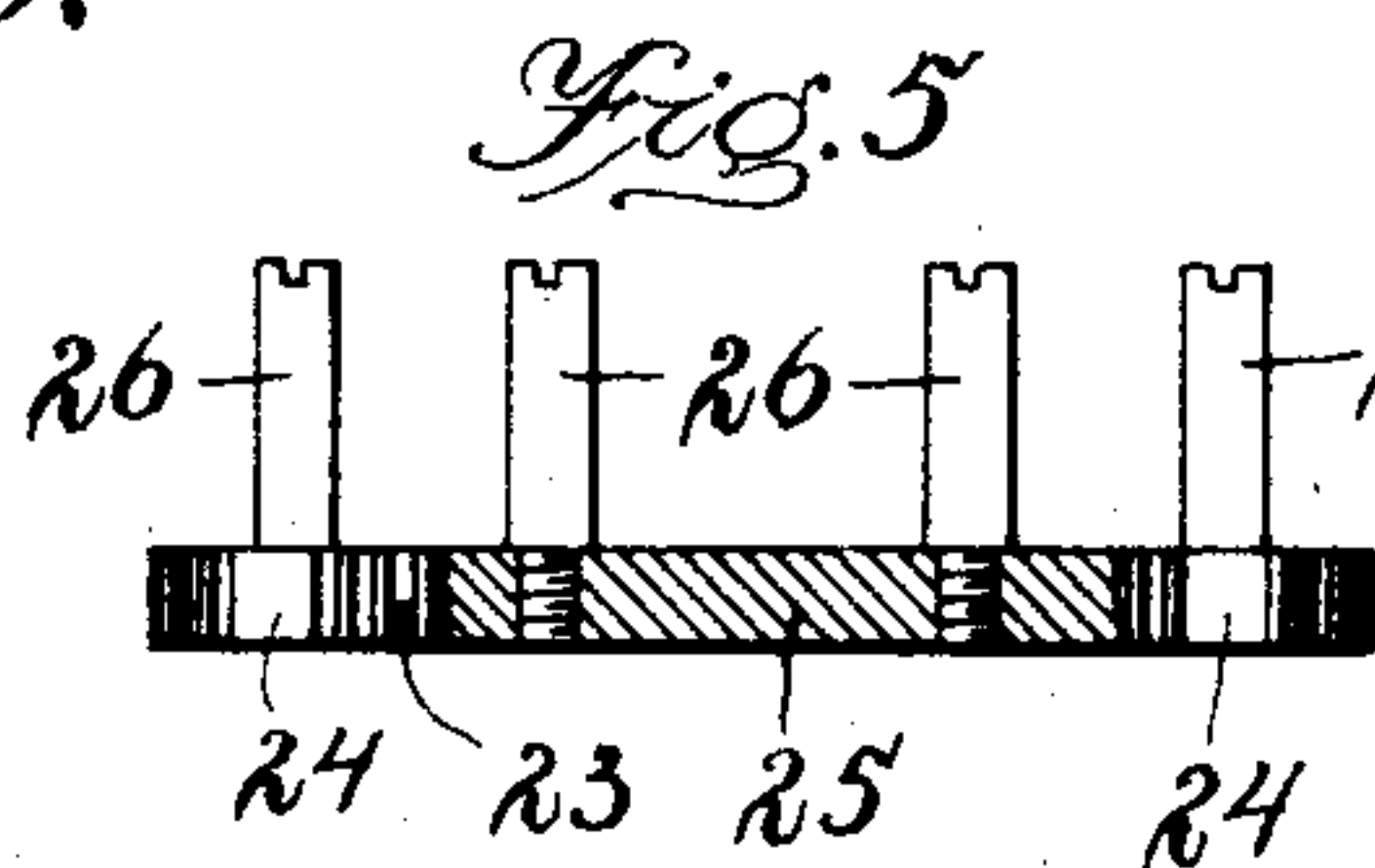
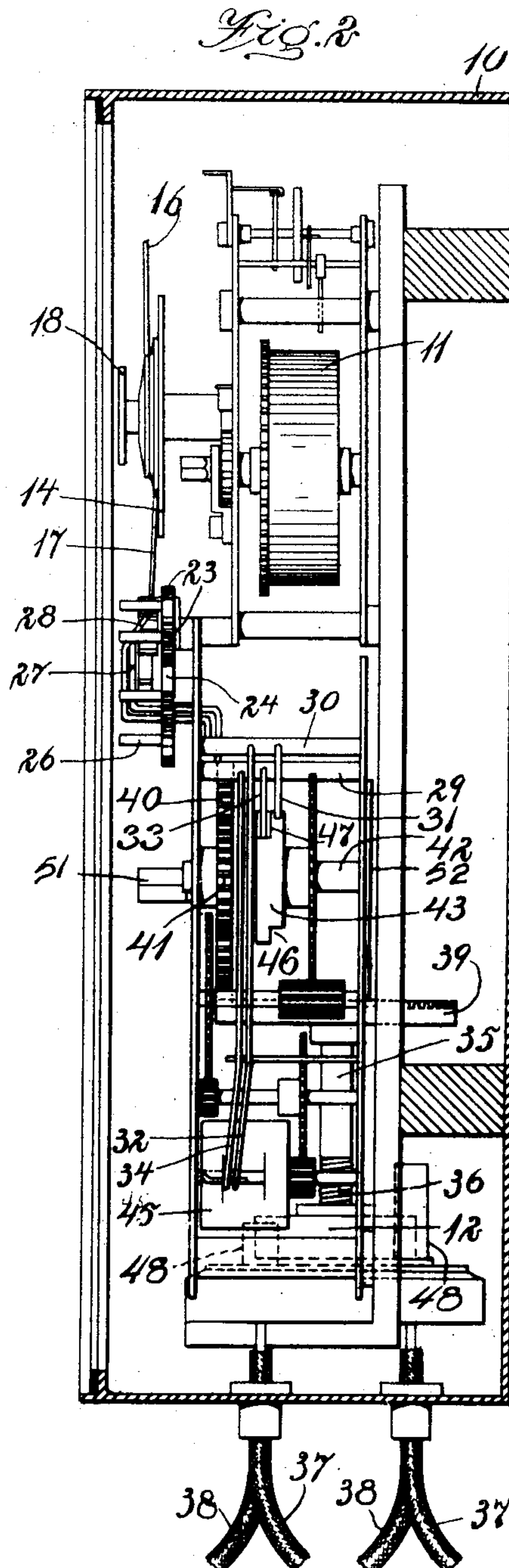
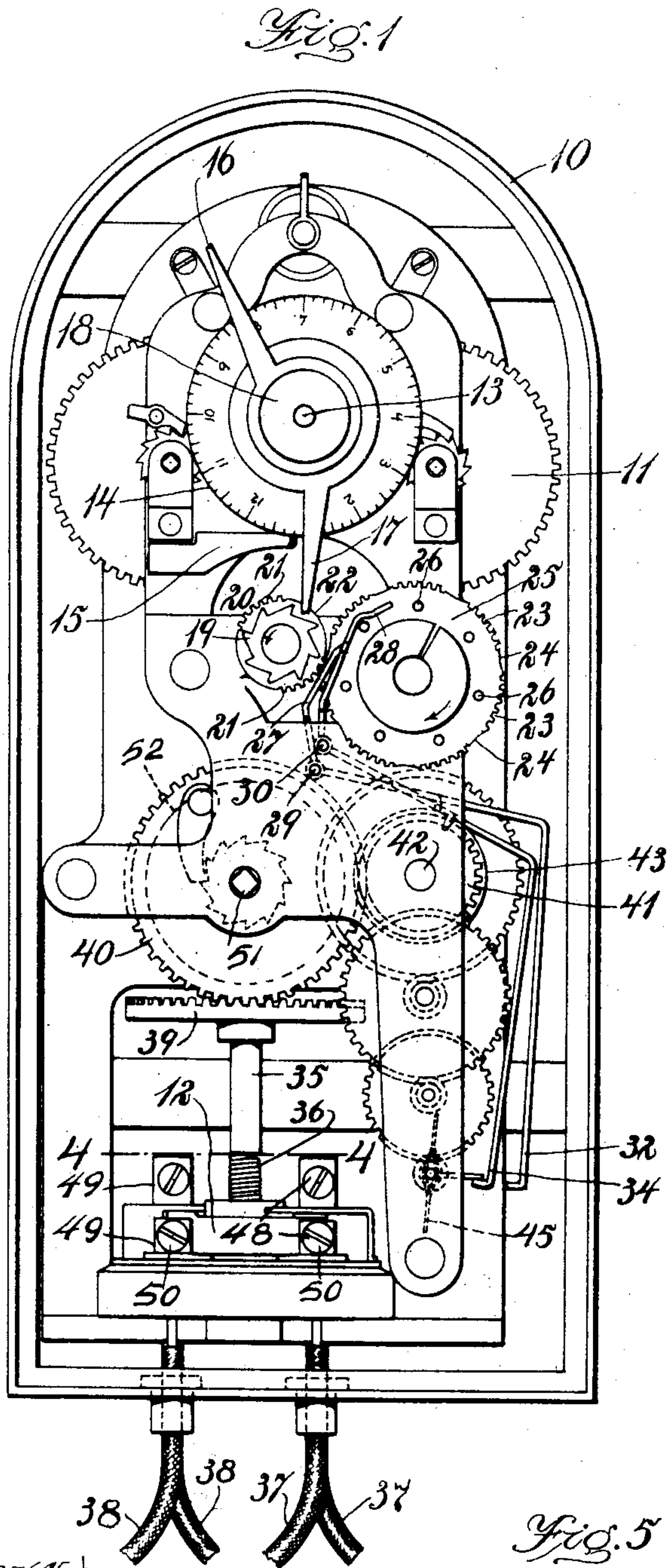


J. REDDING.
ELECTRIC TIME SWITCH.
APPLICATION FILED MAY 21, 1904.

2 SHEETS—SHEET 1.

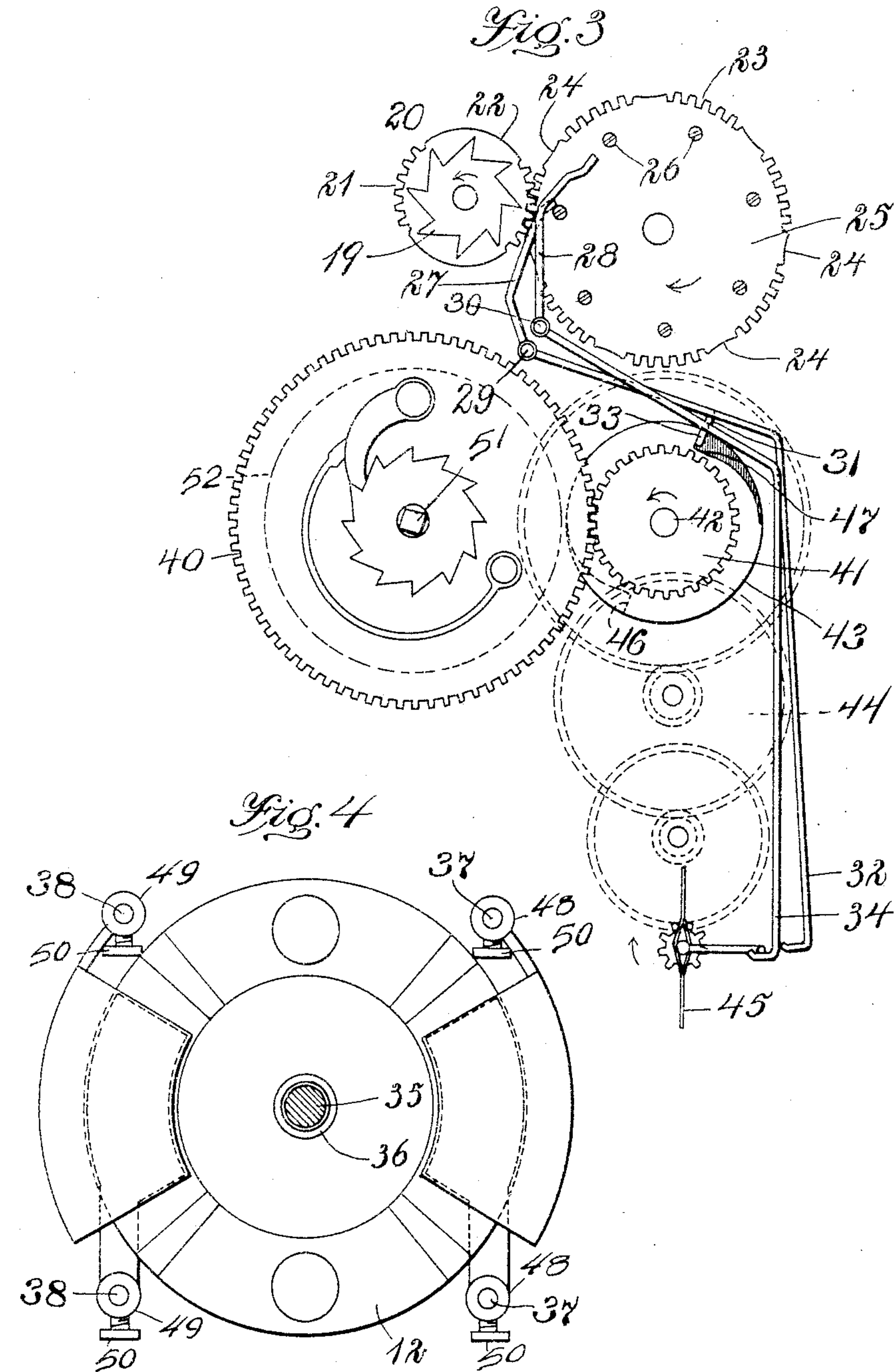


Witnesses:
C. C. Stecher
L. E. Kennedy.

Inventor:
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JEROME REDDING, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO REDDING AUTOMATIC TIME SWITCH COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

ELECTRIC TIME-SWITCH.

SPECIFICATION forming part of Letters Patent No. 790,155, dated May 16, 1905.

Application filed May 21, 1904. Serial No. 209,104.

To all whom it may concern:

Be it known that I, JEROME REDDING, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Electric Time-Switches, of which the following is a specification.

This invention relates to electric time-switches adapted to be automatically controlled by suitable clock mechanism.

The object of the invention is to provide means whereby a current of electricity may be daily closed and opened at predetermined times and for predetermined periods. Switches of this type are best adapted to control street-lighting systems, store lighting, electrical advertisements, &c.

In the embodiment of the invention illustrated the switch-actuating mechanism and the controlling mechanism are designed to operate with one winding during a period of about ten days. With a switch having this scope of operation it might be convenient to rewind the spring-motors and alter the controlling mechanism weekly, according to the changes in the rising and setting of the sun. The switch is designed to be operated by one spring-motor and the clock mechanism for controlling the switch-motor to be operated by an independent motor.

The controlling mechanism carries a clock-dial having two adjustable pointers, of which one causes the switch-motor to close the switch and the other causes it to open the switch, so the daily time at which the switch is to be closed or opened depends upon the position which the pointers occupy on the dial. Therefore the time of closing or opening the switch may be changed by changing the position of the pointers on the dial.

In addition to the control already mentioned the controlling mechanism may be so set as to be ineffective during certain predetermined periods, such as holidays occurring between the dates of winding the spring-motors. In the switch-controlling mechanism each day is represented by a removable stud, and hence the controlling mechanism is rendered inef-

fective to the extent of one day for each stud removed.

Of the accompanying drawings, forming a part of this specification, Figure 1 shows, in front elevation, an electric switch embodying my invention. Fig. 2 is a side elevation thereof. Fig. 3 is a detail of the releasing mechanism. Fig. 4 is a section on line 4-4 of Fig. 1. Fig. 5 is an edge view of the stud-wheel, a part of which is broken away.

The same reference characters indicate the same parts or features in all the figures.

Referring to the drawings, a casing 10 is shown as inclosing a suitable clock-movement (indicated in a general way at 11) and an electric four-pole switch 12. The clock mechanism comprises an arbor 13, which completes one revolution in each twelve hours and which corresponds to the arbor on which the hour-hand of a clock is set. To the arbor 13 is affixed a dial 14, on which the twelve hours of a day are made to read counter-clockwise. Each hour-division is subdivided into six spaces, so that each subdivision represents ten minutes. Extending from some convenient part of the clock-frame is a stationary finger 15, which coacts with the dial 14 in indicating the time of day or night. Upon the arbor 13 are two pointers or actuators 16 and 17, which extend beyond the edge of the dial. They are free to be moved about the arbor 13, but are adapted to be clamped by a thumb-screw 18 against the dial 14, with which they rotate. The actuators 16 and 17 successively engage the teeth of a ratchet 19, each actuator moving the ratchet one tooth at a time, so that in the course of twenty-four hours the ratchet will be advanced four teeth. The ratchet is affixed to an intermittent or mutilated pinion 20, having operative toothed portions 21 and inoperative smooth portions 22. The portions 21 and 22 coöperate with a series of complementary portions 23 and 24 of an intermittent or mutilated gear 25 in such wise that the gear 25 will receive two impulses for each four impulses of the pinion 20. The gear 25 carries a series of removable studs or

points 26, equal in number to the operative portions 23 of said gear and arranged in a circle thereon and equidistant from each other, said disk and points constituting a rotatable controller.

The points 26 in the course of rotation with the gear 25 successively engage and displace two fingers 27 and 28 alternately, because one of said fingers extends beyond the other about half the distance between two of said points. The fingers 27 and 28 are affixed to two rock-shafts 29 and 30, respectively. The rock-shaft 29 carries two hooked arms 31 and 32, and the rock-shaft 30 carries hooked arms 33 and 34, whose function is hereinafter described.

The switch 12 is of that type known as a "snap-switch." It is mounted upon a stem 35, and as a result of a slow steady rotation of said stem the switch snaps, by means of a spring 36, from a position which connects the conductors 37 and the conductors 38 to a position which disconnects them. The stem 35 carries a crown-gear 39, which meshes with a gear 40, mounted upon an arbor 51, which is driven by a spring 52. A gear 41, also meshing with the gear 40, is affixed to an arbor 42, to which is also affixed a disk 43. The disk 43 is located beneath the two hooked arms 31 and 33, which extend side by side from the rock-shafts 29 and 30. Said arms bear upon the periphery of the disk 43, with a result hereinafter described. A gear-train 44, of which the gears 40 and 41 form a part, terminates with a fan-governor 45. The hooked ends of the arms 32 and 34, which are actuated by the displacement of the fingers 27 and 28, alternately engage and release the fan-governor 45, but only when permitted to do so by the arms 31 and 33 bearing on the disk 43.

A notch 46 is formed in the periphery of the disk in the same plane with the arm 31, and a notch 47 is formed diametrically opposite to the notch 46, but in a plane with the arm 33. Hence as the disk and governor revolve simultaneously the arms 32 and 34 engage said governor only when one of the notches in said disk allows one of the hooked arms 31 and 33 to drop into it. The relation of the notched disk to the switch 12 is such that one of the notches 46 and 47 approaches its engaging arm immediately after said switch has snapped to a new position. The function of the disk 43 is to hold the arms 32 and 34 out of engagement with the governor 45 long enough to allow the switch to be snapped.

Naturally a switch of this kind is destined to be once turned on and once turned off in each twenty-four hours; but as the pointers 16 and 17 complete two cycles in twenty-four hours they impart four movements to the pinion 20, as previously stated. Two of said movements are sufficient to cause one of the studs 26 to actuate each of the fingers 27 and

28, so that every alternate two impulses of the pinion 20 are absorbed by the intermissions in the gearing 20 and 25 and effect no movement of the gear 25.

Each point 26 in the gear 25 represents one day. So if it is desired to render the switch ineffective on a predetermined day it is done by removing the corresponding point from the gear. As a result the gear 25 will still be actuated by the clock mechanism; but it will not actuate the arms which control the fan-governor on the day for which the stud is omitted.

The embodiment of the invention as shown is especially designed to control street-lights and to be inclosed in an upright lamp-post. To this end the switch 12 is so located in the casing 10 that the electric conductors or wires 37 37 and 38 38 may enter through the bottom of the casing and be directly connected to binding-post 48 48 and 49 49 by screws 50 without being bent. As a further convenience the heads of the screws 50 are toward the front of the casing 10, so that they may be more readily manipulated.

It has been found by practice that the time of extinguishing a street-light seldom varies, but that the time for lighting varies according to the setting of the sun. Therefore the actuator 17, which effects the opening of the switch, is seldom moved about the dial 14. The actuator 16, however, which effects the closing of the switch, is moved about the dial as conditions require. The latter actuator shows on the dial that it is set to close the switch at eight o'clock and the actuator 17 is set to open the switch at one o'clock. The actuator 17 is given a relatively broad bearing on the dial; but the actuator 16 is given a smaller bearing, so that when the latter is moved to another position on the dial it will not be liable to disturb the former actuator.

Having thus explained the nature of the invention and described a way of constructing and using the same, although without attempting to set forth all of the forms in which it may be made or of all the modes of its use, it is declared that what I claim is—

1. In an electric time-switch, a switch, a switch-motor, a clock-movement having adjustable actuators, and controlling mechanism for the switch-motor comprising a ratchet arranged to receive impulses from the actuators, means for releasing and stopping the switch-motor, and operative mechanism interposed between the ratchet and the releasing and stopping means in consequence of which the latter is controlled by said ratchet.

2. In an electric time-switch, a switch, a switch-motor, a clock-movement having adjustable actuators, and controlling mechanism for the switch-motor comprising a device for releasing the switch-motor, a device for stopping the switch-motor, a rotatable controller having a plurality of removable points

each of which actuates said devices in succession, and a ratchet operated by the actuators successively for rotating said controller.

3. In an electric time-switch, a switch, a
5 switch-motor, a clock-movement having adjustable actuators, and controlling mechanism for the switch-motor comprising a device for releasing the switch-motor, a device for
10 stopping the switch-motor, a rotatable controller having a plurality of removable points each of which actuates said devices in succession, a ratchet operated by said actuators successively and intermittent gears connecting
15 said ratchet with said rotatable controller.

4. In an electric time-switch, a switch, a
15 motor for actuating said switch, a clock-movement having a disk rotatable in twelve hours and adjustable actuators rotatable with said

disk, a ratchet arranged to be engaged by said actuators successively, a rotatable controller
20 having removable pins corresponding to the days of the week, intermittent gearing connecting said ratchet with said controller whereby said controller receives two impulses from
25 each alternate two impulses of said ratchet, a motor-releasing device and a motor-stopping device, said devices being operated successively by each of said pins to start and stop the motor.

In testimony whereof I have affixed my signature in presence of two witnesses.

JEROME REDDING.

Witnesses:

M. B. MAY,

C. C. STECHER.