U. S. KREIDER.

AUTOMATIC ELECTRIC WINDING CLOCK.

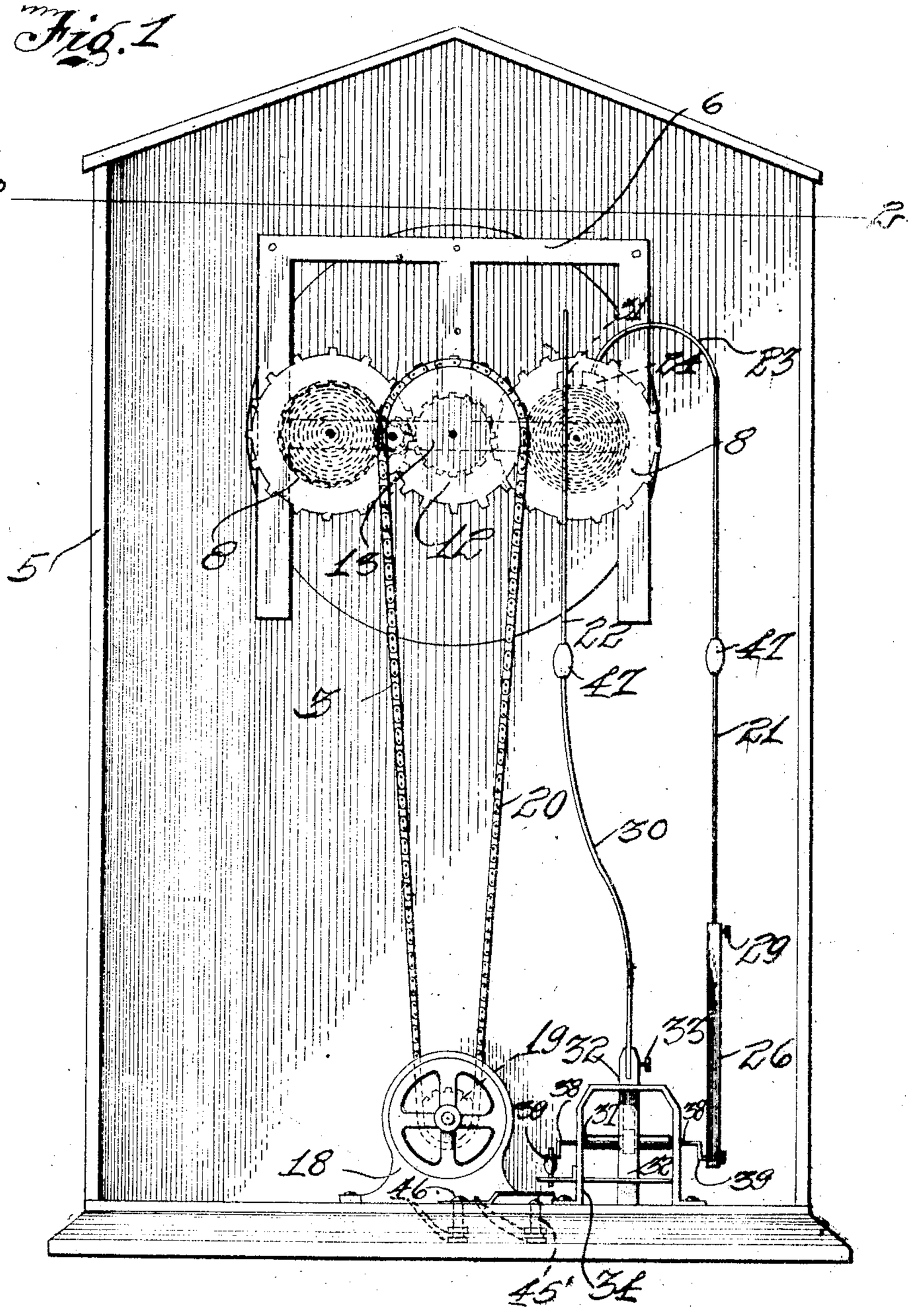
APPLICATION FILED SEPT. 1, 1914.

1,166,605.

Patented Jan. 4, 1916.

3 SHEETS—SHEET 1.

Fig. 1



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3 SHEETS—SHEET 2.

Fig. 2.

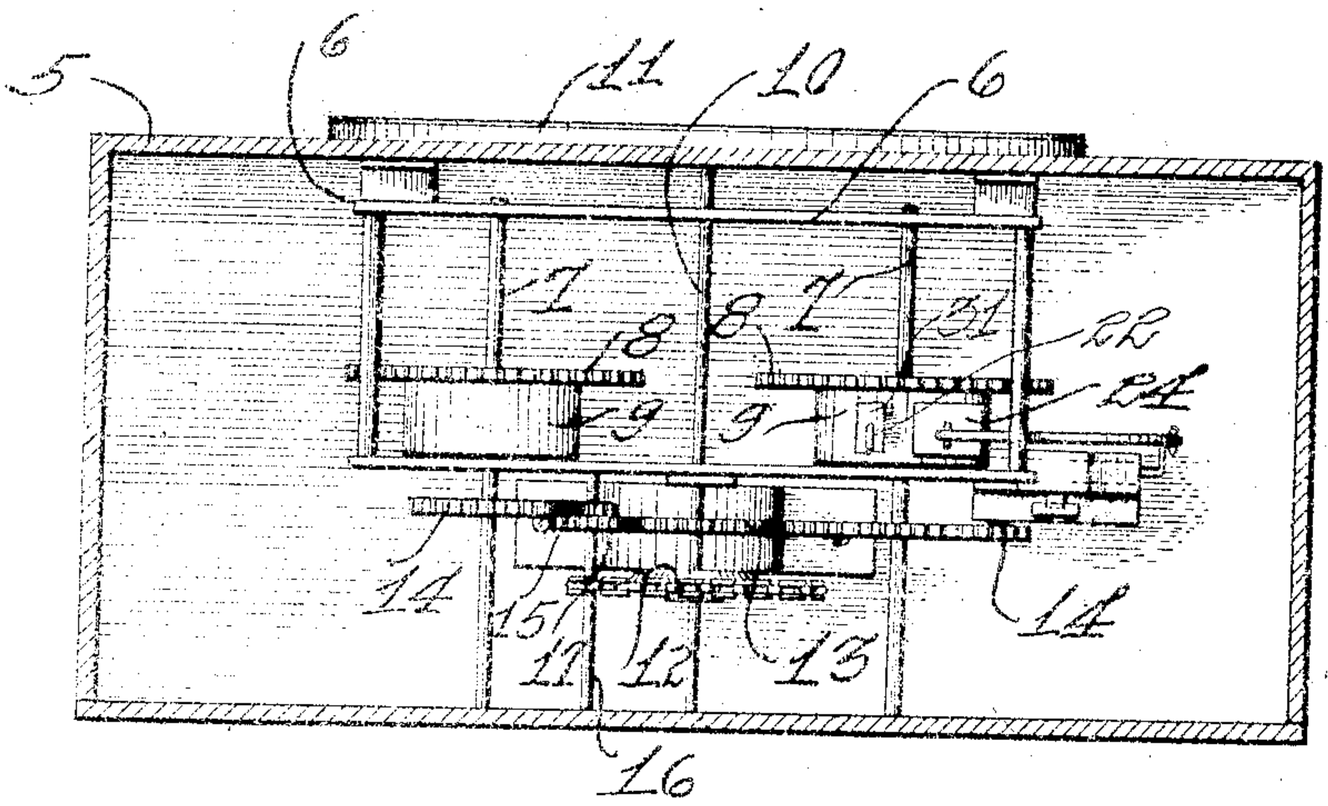
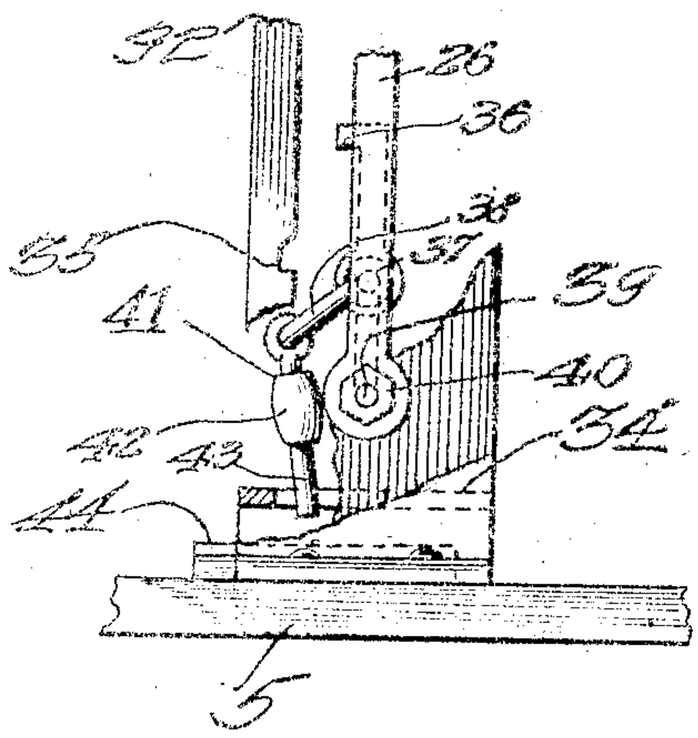


Fig. 5.



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3 SHEETS—SHEET 3.

Fig. 4.

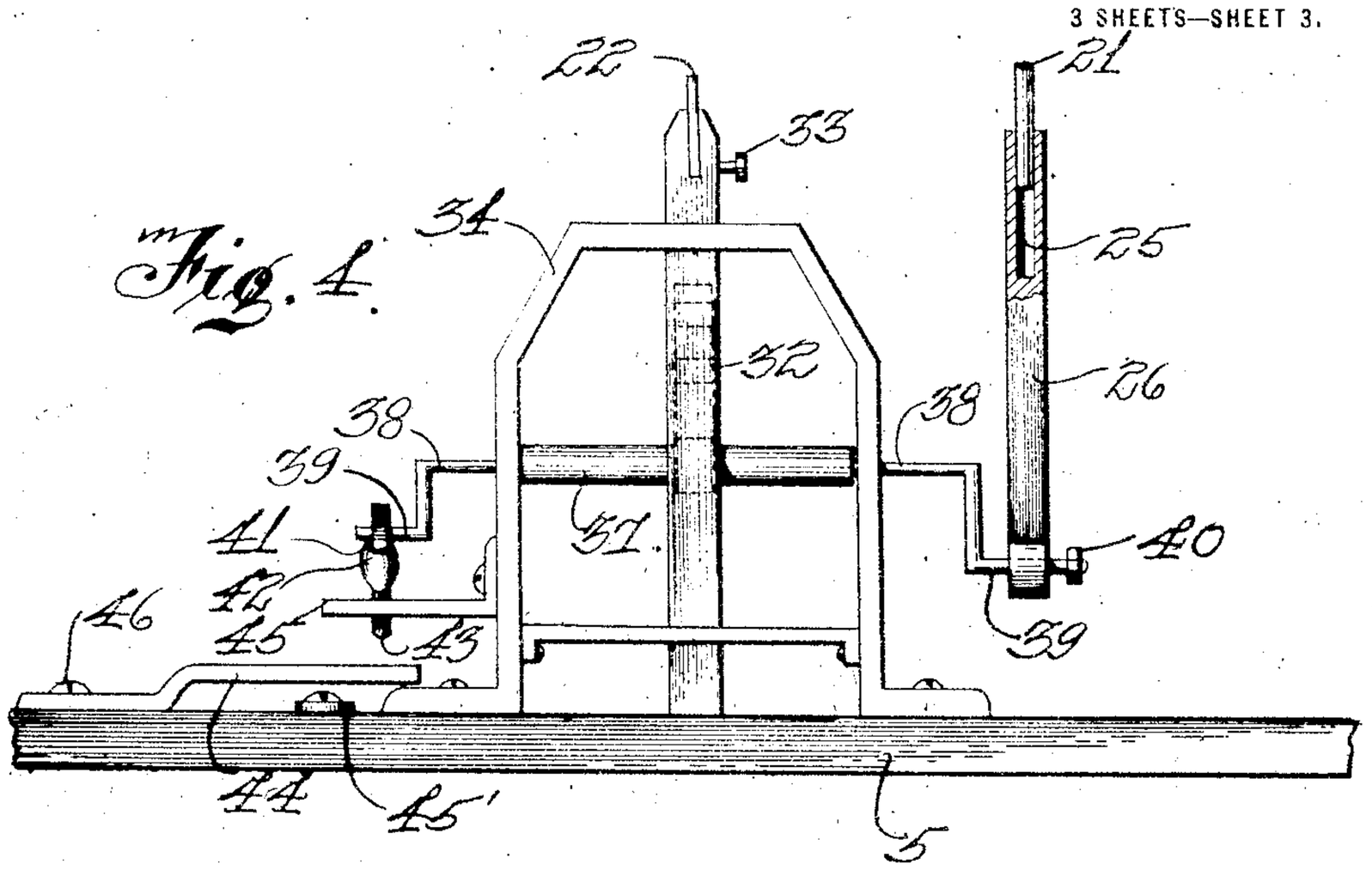
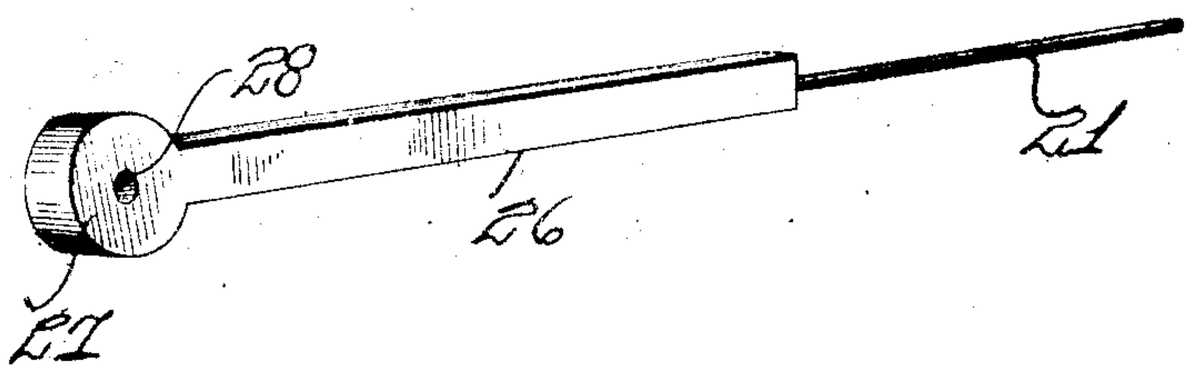


Fig. 5.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC ELECTRIC-WINDING CLOCK.

1,166,605. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed September 1, 1914. Serial No. 859,702.

To all whom it may concern:

Be it known that I, UCAL S. KREIDER, a citizen of the United States, residing at Arcanum, in the county of Darke and State of Ohio, have invented certain new and useful Improvements in Automatic Electric-Winding Clocks, of which the following is a specification.

This invention relates to automatic electric winding clocks, and has for one of its objects to periodically utilize an electric source of power to rewind the clock when a predetermined amount of energy has been expended therefrom.

A further object of the invention resides in the provision of an electric motive agent which is in connection at all times with the clock mechanism, the actuation of said agent being completely controlled by the clock springs, thereby automatically closing an electrical circuit when a predetermined amount of energy has been expended from the springs, the circuit being automatically opened when the springs are rewound.

A further object of the invention is to use substantially the same clock mechanism common to standard makes of clocks, thereby reducing the cost of manufacturing to a minimum, the clock mechanism being placed in connection with any desired type of motor.

A still further object of the invention is to provide a mechanism for rewinding both of the springs, common to an eight-day clock mechanism with which my improved device is adapted for association, the mechanism being in connection with only one of said springs, so as to actuate the mechanism as soon as a predetermined amount of energy has been expended from the springs, the operation of said mechanism closing the circuit and operating a power element, so as to simultaneously rewind both of said springs in the furtherance of replenishing the power desired in the operation of the clock.

Other objects as well as the nature, characteristic features and scope of my invention will be more readily understood from the following description taken in connection with the accompanying drawings and pointed out in the claims forming a part of this specification.

Referring to the drawings: Figure 1 is a rear elevation of a clock constructed in accordance with my invention, the rear wall thereof being removed to disclose the mode of operation for rewinding the springs. Fig. 2 is a transverse sectional view taken on the line 2—2 of Fig. 1 illustrating to advantage the clock mechanism. Fig. 3 is a detailed enlarged fragmentary view of the device, illustrating the locking means by which the movement of the floating bar is limited. Fig. 4 is a detailed enlarged fragmentary front elevational view of the trigger means illustrating to advantage the manner in which the circuit is automatically opened and closed consistent with the actuation of the clock springs; and Fig. 5 is a detailed enlarged perspective view of the means through which motion is imparted from the springs for controlling the circuit.

In the drawings wherein is illustrated the preferred embodiment of this invention, a clock 5 is provided, which in the present instance comprises an enlarged casing made of wood or any other suitable material, and in the present instance is of a substantially rectangular configuration, similar to the type of eight-day clocks now in use.

Mounted in the casing and secured thereto in any suitable manner is a clock frame 6 which has mounted therein parallel shafts 7 upon which are mounted enlarged gear wheels 8 and springs 9, said shafts 7 being extended through the frame 6 and being engaged with the rear wall of the casing as illustrated to advantage in Fig. 2. A central shaft 10 extends from the clock face 11 to the rear wall of the clock casing as is also shown to advantage in Fig. 2, and has mounted thereon an enlarged spur gear 12 and a small gear wheel 13. The portions of the shaft 7 which extend between the frame 6 and the inner face of the rear wall of the casing have mounted thereon gear wheels 14 which are adapted for meshing engagement with the gear wheel 13 of the central shaft 10, one of said gears 14 being relatively larger than the other and being directly in mesh with the gear wheel 13, while the other gear wheel 14 engages in mesh first with a small gear wheel 15 which communicates motion to a stub shaft 16 upon which said gear wheel 15 is mounted, the shaft 16 being further provided with a gear wheel 17 which engages in mesh with the gear wheel 13, thereby simultaneously imparting movement to the shafts 7 for rewinding the springs, when motion is imparted to the central shaft 10.

Motion is imparted to the central shaft

10 by an electric motor 18, the latter in the present instance having a cog wheel 19 associated therewith with which is engaged a sprocket chain 20, the latter being engaged with the gear wheel 12 of the central shaft 10, thereby operating the latter when the electric motor is actuated.

In order to operate the electric motor, when a predetermined amount of energy has been expended from the springs 9, a mechanism is provided in the present instance comprising a pair of rods 21 and 22, the former having the upper end 23 thereof bent into a semi-circular configuration and having a shoe 24 arranged on its terminal, the latter being engaged with one of the springs 9 as shown in Fig. 2. The opposite end of said rod 21 is detachably mounted in a recess 25 in the upper end of a bar 26, the lower end of the latter being enlarged and of a circular contour as indicated at 27 and shown to advantage in Fig. 5, said circular end provided with an aperture 28 therein for a purpose which will subsequently appear. The rod 21 is held from displacement in the recess 25 by a set screw 29. The rod 22 is offset midway its ends as indicated at 30 in order to avoid interference with the rod 21, the upper end of said rod 22 being likewise curved into a substantially semi-circular configuration and having a shoe 31 arranged on its terminal. The lower end of the rod 22 is detachably mounted in a recess formed in the upper end of a bar 32, being held therein from displacement by a set screw 33. The bar 32 is mounted in a frame 34 and is provided with a notch 35, the upper wall of which is beveled as shown to advantage in Fig. 3 for engagement with a trigger 36, the latter being fixedly mounted upon a rotatable drum 37, arms 38 extending from the opposite ends of said drum, the terminals 39 of which are offset.

One of the terminals 39 is engaged through the aperture 27 of the bar 26, and has threaded thereon a nut 40 in order to prevent the casual displacement of the bar 26 from said offset portion 39, at the same time permitting its expeditious removal when so desired. The opposite terminal 39 from that which is engaged with the bar 26 is pivotally engaged with an arm 41, the latter having a weight 42 mounted thereon. The free end of the arm 41 pends in an elongated transversely arranged slot in a guide member 45, as shown to advantage by the dotted lines in Fig. 3. One end of the guide 45 is secured to the frame 34, while the opposite end extends outwardly at right angles to the frame in superposed relation to one terminal of a resilient clip 44. The opposite terminal of said clip is secured to the base of the casing 5, by a bolt 46, the latter likewise capacitating as a binding post for one of the circuit wires, as shown in Fig. 1. The other side of the circuit is grounded to a bolt 45′, the head of the latter lying subjacent the free terminal of the clip 44. The weight 42 is sufficiently heavy to force the free end 43, of the arm 41, into engagement with the resilient clip 44, thereby pressing the latter into contact with the head of the bolt 45 and completing an electrical circuit. The circuit wires pass from the bolts 45′ and 46 to the power element or electric motor 18, whereby when the circuit is closed by pressing on the resilient clip 44 so as to make the same contact with the bolt 45′, the electric motor 18 will be operated.

In operation therefore assuming that a predetermined amount of energy has been expended from the spring 9 with which the shoes 24 and 31 are in engagement, it is seen that the elevation of the rods 21 and 22, caused by the expansion of the spring, causes the bars 26 and 32 to be elevated, consequently rotating the drum 37 and permitting the arm 41 to be operated through the aperture in the guide 45. The resilient clip 44, will consequently be pressed into engagement with the contact bolt 45′, thereby closing the circuit so as to operate the motor in a manner heretofore described. During the elevation of the bars 26 and 32, the trigger 36 is being gradually advanced toward the bar 32, so that by the time the recess 35 of the bar 32 is in alinement with the upper end of the trigger 36, the latter will be forced into engagement with the marginal edge of the bar 32. Consequently the trigger 36 will fall into the recess 35, in view of the right-angled configuration of the free end of said trigger 36, so as to limit the upward movement of the bar 32, at the same time permitting the trigger 36 to be readily disengaged from said recess as soon as the springs have been rewound. In view of the configuration of the upper wall of the recess, removal of said right-angled end from the latter is permitted as soon as pressure is exerted on the terminals 39 of the member 38. This phase of movement takes place when the springs 9 are rewound in view of weights 47 which are mounted on the rods 21 and 22, so as to cause the reverse rotation of the drum 37, thereby raising the arm 41 through the aperture in the guide 45 and allowing the circuit to be opened, to render the motor 18 inoperative. Of course successive operations in this manner are permitted in view of the automatic working of the various parts of the invention as heretofore described.

It will be understood that the above description and accompanying drawings comprehend only the general and preferred embodiment of my invention and that various minor changes in details of construction, proportion and arrangement of parts may

be made within the scope of the appended claims and without sacrificing any of the advantages of my invention.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In combination with a plurality of clock springs, an automatic electric winding clock including a plurality of rods pending from said springs and weighted to hold the rods snugly in engagement with the springs at all times, mechanism in connection with said rods and operated by the movement of the latter, means operable by the movement of the mechanism, to close an electrical circuit, a power element in the circuit, and means for operatively connecting the power element with said springs, for rewinding the latter when the circuit is closed.

2. A device as specified, including a housing a clock mechanism mounted in the housing comprising the usual train of gears and springs, a power element carried by the housing and in connection with said mechanism, rods, one end of each of which is in engagement with one of said springs, a frame arranged in the housing and in proximity to said power element, a shaft revolubly mounted in said frame and being in connection with said rods, and an arm carried by said shaft to close the electrical circuit for operating the power element for winding said springs.

3. An automatic electric winding clock including a clock frame, springs mounted in said frame, mechanism for rewinding said springs after a predetermined amount of energy has been expended therefrom including, in combination with a power element, a pair of rods in engagement with one of said springs and being vertically movable when the latter is expanded, a drum in connection with said rods adapted to be rotated when the latter are raised by the expansion of the spring, an arm carried by said drum for closing an electrical circuit to operate said power element, when said rods are elevated a predetermined distance, and means associated with said drum for limiting the upward movement of said rods.

4. An automatic electric winding clock including a clock frame, springs mounted in said frame, a power element arranged in proximity to said springs and being in connection with the latter to simultaneously rewind the same when the power element is operated, rods, one end of each of which is in connection with one of said springs, means detachably connected with the opposite end of each of said rods adapted to be actuated by the movement of the latter, an electrical circuit adapted to be closed by the operation of said means when said rods are raised for operating said power element, and a trigger carried by said means and automatically actuatable by the initial movement of said rods to limit the subsequent movement of the latter.

5. An automatic electric clock winding mechanism including a clock frame, springs mounted in said frame, a power element in connection with said springs for simultaneously rewinding the latter, means for operating said power element whereby said springs are periodically rewound, including a pair of rods, one end of each of which is in engagement with one of said springs, a drum rotatably mounted in proximity to said power element, and associated therewith to operate the latter at times by the movement of said drum, the opposite ends of said rods being in engagement with said drum one of which operates the latter by the expansion of the spring and means carried by said drum for engagement with the other of said rods to limit the upward movement of both of the latter, and being automatically disengaged therefrom when said rods are lowered, substantially as specified.

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

UCAL S. KREIDER.

Witnesses:
HENRY LAYER,
SARAH LAYER.