W. B. GARRETT.

ELECTRIC TIME SWITCH.

APPLICATION FILED MAR. 21, 1914.

1,146,151.

Patented July 13, 1915.

3 SHEETS—SHEET 1.

Fig. 2.

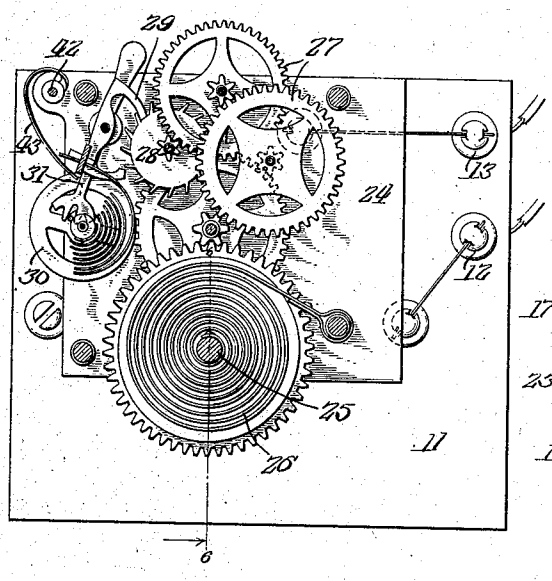


Fig. 1.

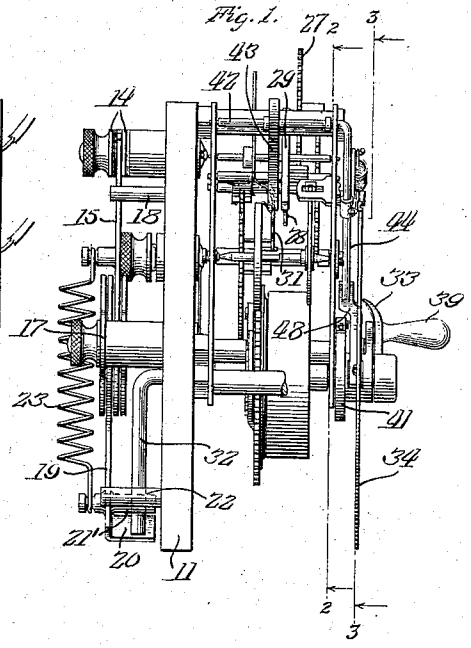
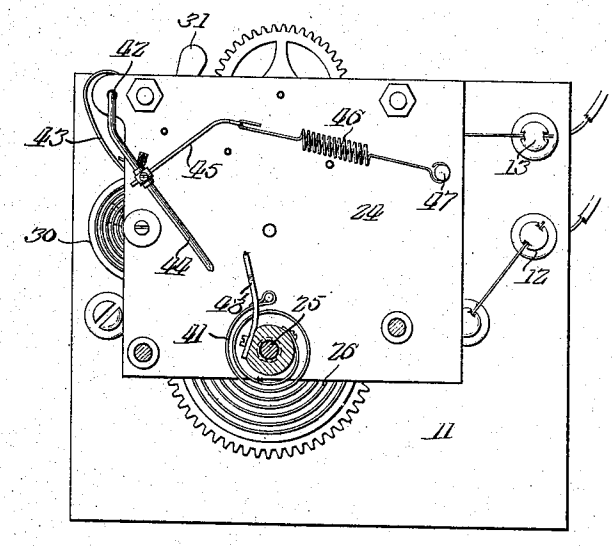


Fig. 3.



Witnesses:

W. L. Dour.

John McCarra Jr.

Inventor:

William B. Garrett

By Pond & Wilson

Attys

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

W. B. GARRETT.

ELECTRIC TIME SWITCH.

APPLICATION FILED MAR. 21, 1914.

1,146,151.

Patented July 13, 1915.

3 SHEETS—SHEET 2.

Fig. 4.

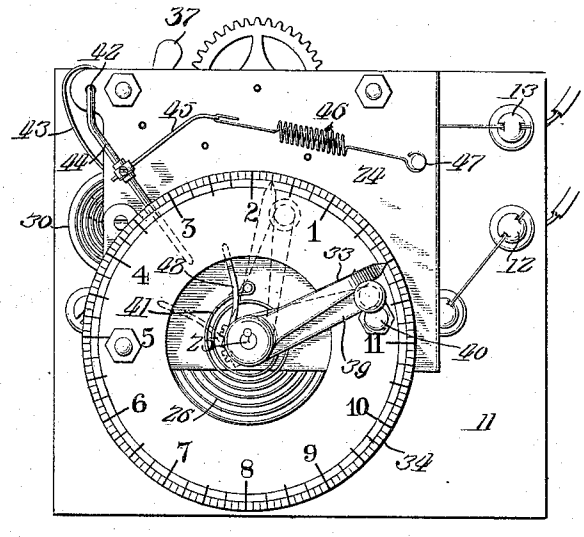


Fig. 5.

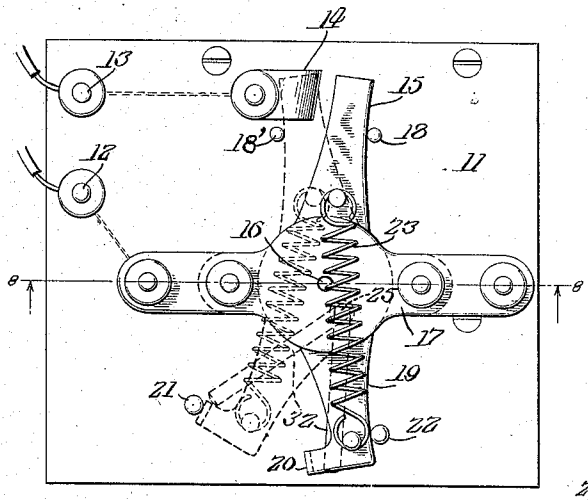


Fig. 6.

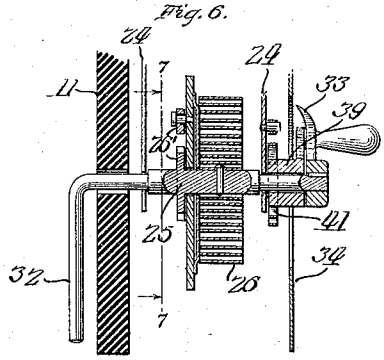


Fig. 7.

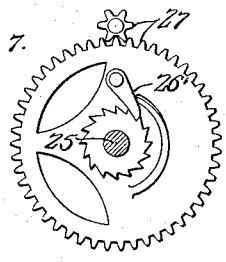
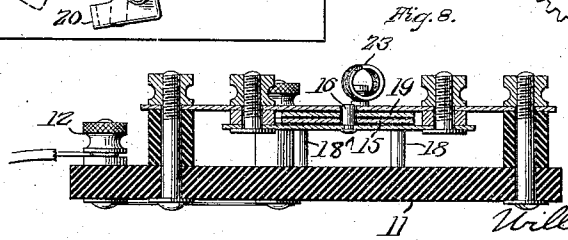


Fig. 8.



Witnesses:

W. L. Dow.

John F. McCanna, Jr.

Inventor:

William B. Garrett

By Pond & Wilson

Attys.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

W. B. GARRETT.

ELECTRIC TIME SWITCH.

APPLICATION FILED MAR. 21, 1914.

1,146,151.

Patented July 13, 1915.

3 SHEETS—SHEET 3.

Fig. 9.

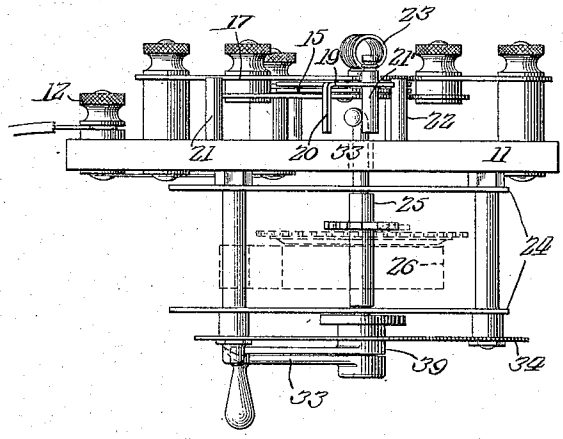
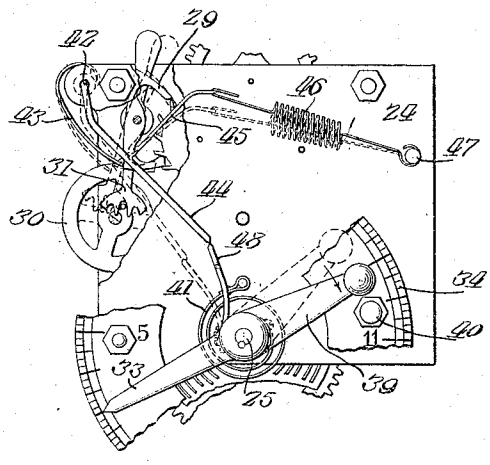


Fig. 10.



Witnesses:

W. L. Dow.

John A. McCamy Jr.

Inventor:

William B Garrett

By Pond & Wilson.

Attys.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM B. GARRETT, OF THERMOPOLIS, WYOMING.

ELECTRIC TIME-SWITCH.

1,146,151. Specification of Letters Patent. Patented July 13, 1915.

Application filed March 21, 1914. Serial No. 826,253.

To all whom it may concern:

Be it known that I, WILLIAM B. GARRETT, a citizen of the United States, residing at Thermopolis, in the county of Hot Springs and State of Wyoming, have invented certain new and useful Improvements in Electric Time-Switches, of which the following is a specification.

This invention relates to time controlled switch mechanism such as is used with electric circuits where it is desirous of maintaining a circuit closed a predetermined time, or vice versa.

It is the object of my invention to provide in combination with a suitable time-mechanism and a switch, a novel means for operatively connecting same and for controlling same whereby with the setting of a controlling member to any time indication the switch is automatically closed and the time-mechanism automatically set in operation; and further, where said time-mechanism is actuated by a spring motor or the like, the same is wound for operation by said setting movement of the controlling member.

A further object is to provide a connection from the time-mechanism for actuating the switch, in which the latter is actuated by movement of the connection and said connection then automatically released from operative relation with the switch, whereby a lost-motion connection is obtained between the time-mechanism and switch to allow the switch to be operated only at predetermined times.

A further object is to embody with a clock-mechanism and switch operating member, a means for positively starting the clock-works simultaneously with operation of the switch operating member.

A further object is in the provision with a dial, of an indicator therefor which operates with the clock-mechanism and switch, and a member operable with setting movement of said indicator for automatically starting the clock-mechanism in operation.

A further object is to provide in a time switch device a clock-mechanism that runs only when the switch is thrown and is automatically stopped when the time limit is reached.

In the accompanying drawings, Figure 1 is a side elevational view of a clock-works of ordinary structure in combination with a switch and having my improvements embodied therewith. Fig. 2 is a vertical sectional view as taken on a line 2—2 illustrating the clock-works mechanism. Fig. 3 is a vertical sectional view taken on the line 3—3 of Fig. 1, for the purpose of showing more clearly the means for starting the clock-works escapement. Fig. 4 is a face view of the control and indicating side of my improved time controlled switch, the several operative members being in operative positions. Fig. 5 is a face view of the switch side of the mechanism, the switch opened. Fig. 6 is a detail vertical sectional view taken on the line 6—6 of Fig. 2, detailing the control shaft structure. Fig. 7 is a detail sectional view on the line 7—7 of Fig. 6. Fig. 8 is a horizontal sectional view as taken on the line 8—8 of Fig. 5, illustrating the switch structure in section. Fig. 9 is a view of my improved mechanism looking from the base line of Fig. 5, up, the clock-works being indicated merely. Fig. 10 is a fragmentary view taken from Fig. 4 showing the indicator set at one-half its range of operation and the operating handle having actuated the escapement detent to start the clock-works.

In my invention is embodied the time-mechanism and the electric switch controlled by the action thereof; and these several mechanisms are peculiarly arranged and in combination with them I add my improvements, the whole effecting the objects above set forth and the invention as set forth in the appending claims.

In the drawings I have illustrated the common form of clock-works as the time-mechanism and a switch as of the knife-type, both of which will be more particularly described hereinafter; and these mechanisms are shown unincased, it being obvious that a suitable casing and mounting can be provided therefor.

The fiber or the like insulating section 11 forms the mounting or main frame for the clock-works and switch, being a partition between the two. Two electric terminal poles 12 and 13 are mounted on frame 11, the pole 13 leading to the spring poles 14 of a knife-switch and the pole 12 leading to the conductive arm 15 which is pivoted at 16 to the frame work 17 mounted spaced from frame section 11, the stops 18 and 18′ limiting the closed and open movements of the said arm respectively with the spring poles 14. An arm 19 is pivoted at 16 with

said arm 15, extending diametrically opposite therefrom, carries at its outer end two lateral projections 20 and 21′ and is limited in its range of movement by stops 21 and 22; and a coiled spring 23 is connected at its opposite ends separately to the arms, exerting a tension to swing the arms on their pivot. The stops 17—18—21—22 are so spaced that the arms 15 and 19 are held in contact with stops 18 and 22 respectively so that the spring will be to one side of the pivot 16, the opened position of the switch, as shown in Fig. 5 in full lines; and by swinging the end of lever 19 into contact with stop 21, as will be described hereinafter, the spring will be carried to the opposite side of pivot 16 and will cause the switch arm to close the circuit.

The clock-mechanism of the ordinary type is interposed between plates 24 mounted on frame 11 the main elements of which comprise the spring-shaft 25 and spring 26 therefor, forming the spring-motor, the spring element and shaft being connected by a ratchet 26′, a train of gears 27 operated by the spring motor, and escapement-wheel 28 and its pawl 29, and the time-measurer being the balance wheel 30 and its detent 31 connecting with the escapement pawl 29; whereby turning of the shaft 25 counter clock-wise as shown in Fig. 2 the spring 26 is wound to impart motion to the escapement. As seen most clearly in Fig. 5, the spring-shaft 25 is eccentric to the pivot 16; and as seen in Fig. 6 said spring shaft is extended through frame 11 and is formed with an elbow arm 32 the outer end of which lies interposed between the lateral projections 20 and 21′ of the switch-associated arm 19. Mounted fixed at the outer end of said spring shaft is an indicator arm 33 whose outer end associates with a dial 34 of suitable graduations, such for instance as 12 hours and fractions thereof as illustrated on the drawing; and a crank-arm 39 loosely mounted on shaft 25 at the inner side of the indicator is held normally against the stop 40 by a spiral spring 41. The clock action turns the indicator in a clock wise direction until said indicator strikes the crank arm handle as the limit of movement; and said crank arm is movable manually in a counter clock-wise direction to set the indicator at any point on the dial, at the same time winding the clock spring. The rock-shaft 42 is mounted on the plates 24 in the proximity of the escapement mechanism and carries a spring-arm 43 whose outer end terminates adjacent to and in operable relation with the balance-wheel and of the detent 31, being out of contact with the latter arm when same is in operation, but being movable into contact therewith by rocking of shaft 42 for the purpose of moving the arm 31 to start the escapement mechanism. The rock-shaft 42 is formed with an elbow-arm 44 which has intermediate the ends thereof a lateral arm 45 the outer end of which has a coiled spring 46 attached at one end thereto and its opposite end at 47 to a plate 11, this spring being disposed unexerted in a line intersecting the rock-shaft 42, whereby the crank-arm 44 is maintained in a neutral position but movable in both directions against tension of spring 46. An actuating arm 48 fixedly attached to the sleeve of crank-arm 39 and has its outer end in such relation with the end of arm 44 that by moving crank-arm 39 for purposes above described the end of arm 48 will contact with the end of arm 44, thereby actuating the latter which in turn operates the spring-arm 43 to start the escapement mechanism and operation of the clock.

Operation of the time controlled switch mechanism is as follows: It being desirable to close the electric circuit whose terminals are 12 and 13 by means of the knife-switch, for a certain period of time, for instance six hours, with the mechanism as shown in Figs. 4 and 5 the crank-arm 39 is movable manually in a counter clock wise direction thus moving the indicator therewith as shown dotted in said Fig. 4 and this movement continued until the indicator is opposite the indication 6. During this movement the clock-spring will be wound by the indicator being fixed with the spring-shaft; and upon releasing the crank-arm the spring-shaft ratchet will hold the indicator movable with the unwinding movement of said spring-shaft and the said crank-arm will be movable to its normal position against the stop 40, this latter movement causing the arm 48 to actuate arm 44 and thereby moves spring-arm 44 to put the detent in motion and start the escapement, this action being against the tension of spring 46 which will return the spring-arm to its inoperative position when the contact of arms 48—44 has been broken. Thus with the moving of the control-arm 39 the indicator is set for the circuit period, the spring-motor is wound and the clock-mechanism is automatically set in operation. Turning now to the effect of this operation of the control-arm upon the switch mechanism: The fact will be noted (Fig. 5) that this control-arm movement will swing the elbow-arm 32 of the spring-shaft to the left whereby said arm 32 will contact the extension 20 of switch arm 19 and swing to the left until spring 23 passes pivot 16 whereupon said spring will operate both switch arms, arm 15 to close the circuit and arm 19 against the stop 21. Since the shaft 25 and pivot 6 are non-concentric the end of the spring-shaft arm 32 will at the position of the switch be carried free from the extension 20 as is shown clearly in dotted lines in

Fig. 5 and move free to whatsoever position the indicator 33 is moved. The clock-works having been automatically set in operation as above described, the indicator in the course of 6 hours will be moved clock-wise to its normal position, the spring-shaft arm 32 being correspondingly moved therewith. In the course of the latter movement the said arm 32 will strike the extension 21′ and move the switch associated at 19 therewith carrying the spring 23 beyond the center of pivot 16, whereupon said spring will effect the retracting of the switch-arm 15 and the breaking of the circuit, the ultimate object of the mechanism. At this action the indicator 33 will have reached the control handle 39 and be stopped thereby, thus stopping the clock-work.

It will be seen that with the setting of the indicator to any desired time for closed circuit, several functions are synchronously effected; the spring is wound, the switch is closed and the clock-work is set in operation. It is obvious that time-mechanism of structure other than clock-work herein disclosed may be embodied in the invention, also that different forms of contact switches may be used without departing from the scope of the invention as set forth in the claims.

I claim as my invention:—

1. In a circuit controlling device, a clock-mechanism including a spring-motor, a timing-arbor operated thereby, and a time-measurer; a switch, a connection operable between the timing-arbor and switch for throwing the switch by movement of the timing-arbor; an indicating finger fixedly connected to the timing-arbor, an operating arm loosely mounted on the timing arbor, coöperable with the indicating finger to move the same to a set position, and a connection operable between the operating arm and time-measurer for imparting initial starting movement to the latter when said arm is moved to set the indicating finger and to throw the switch.

2. In a circuit controlling device, the combination of a timing mechanism having a main-spring shaft, a switch, means operable by the main-spring shaft for throwing the switch, a graduated dial, an indicating finger coöperable with the dial and being fixedly mounted on the said shaft, an operating arm loosely mounted on the said shaft and being arranged to move said finger to different set positions whereby the main spring of the timing mechanism is wound by the setting of said finger and the switch is thrown, a spring for retracting the said operating arm after it has been moved to set said finger, and means operable by said operating arm for automatically starting the timing mechanism in operation.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM B. GARRETT.

In presence of—
W. T. Bivin,
A. B. Thomas.

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