J. E. RODKEY & E. C. FARRAR.

PROGRAM CLOCK.

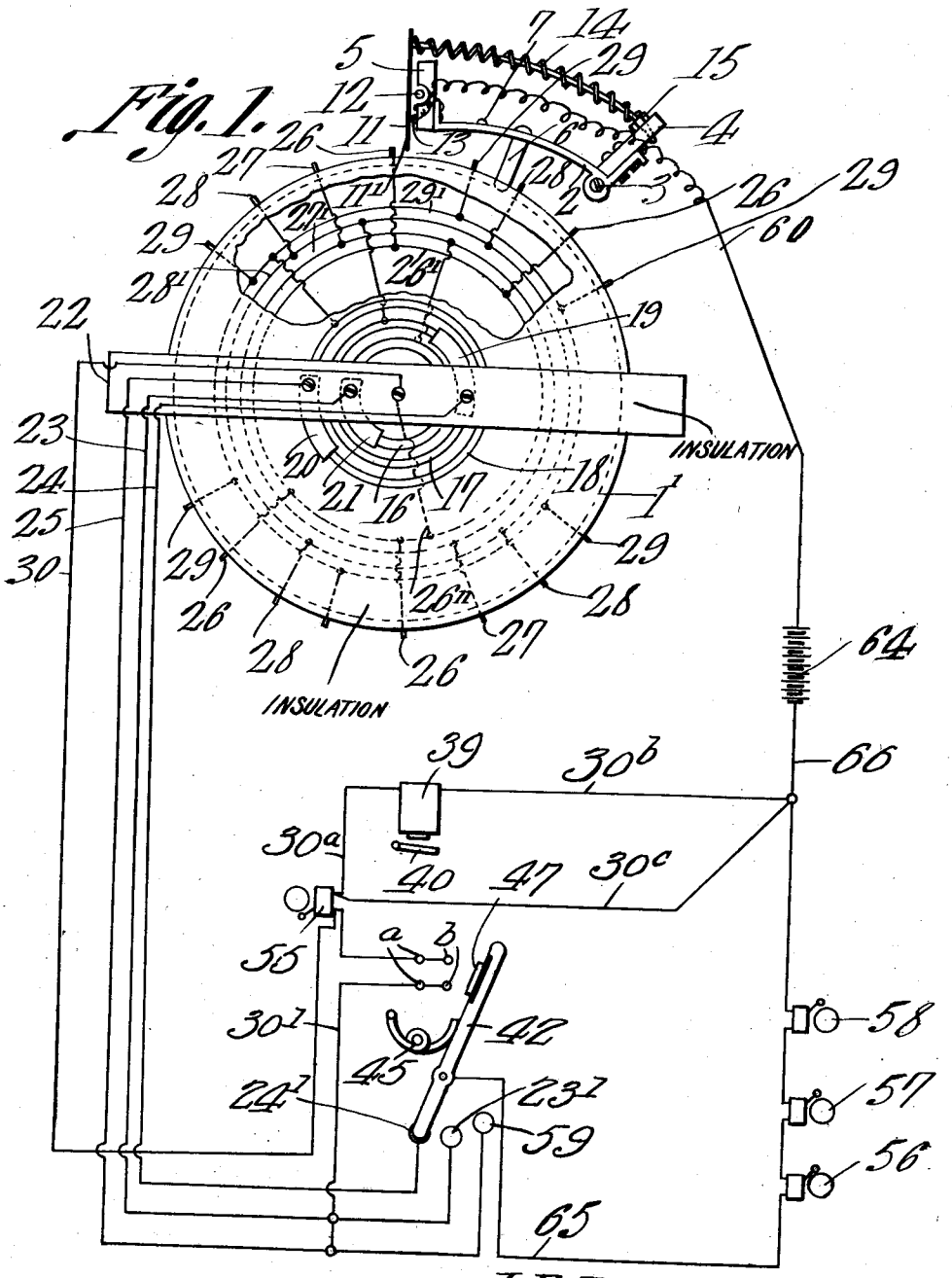
APPLICATION FILED AUG. 17, 1911.

1,051,765.

Patented Jan. 28, 1913.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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3 SHEETS—SHEET 2.

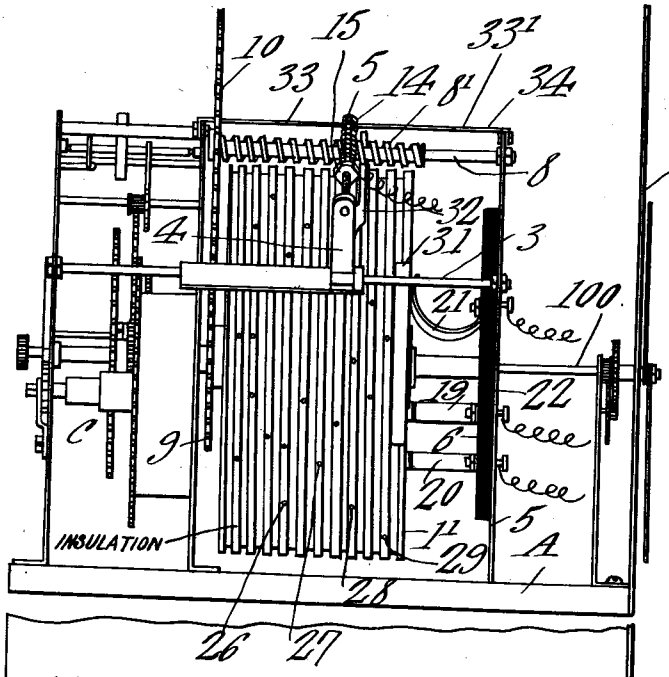


Fig. 2.

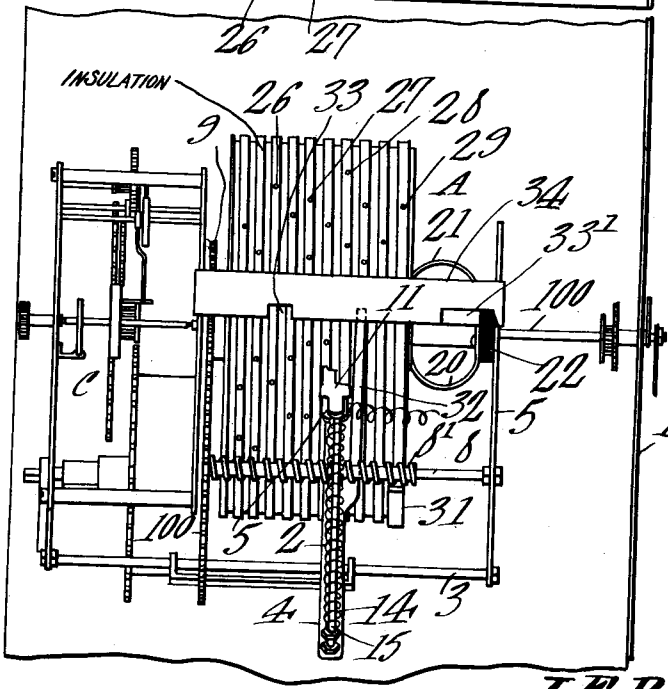


Fig. 3.

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3 SHEETS—SHEET 3.

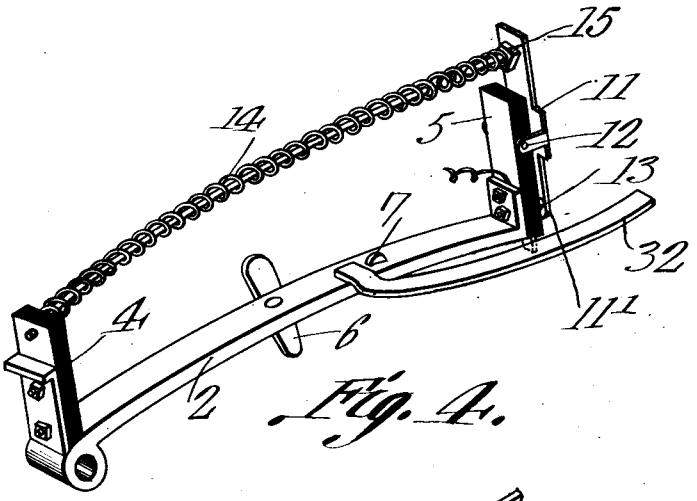


Fig. 4.

Fig. 6.

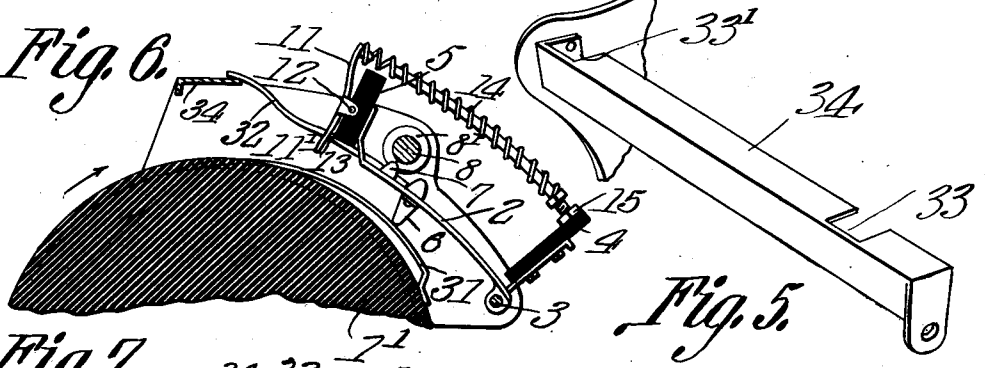
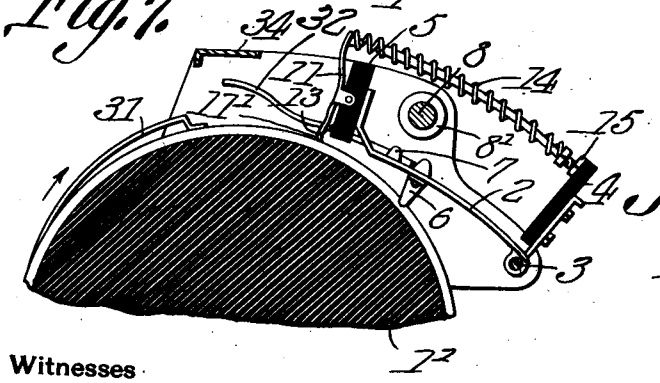


Fig. 5.

Fig. 7.



J. E. Rodkey and E. C. Farrar

Witnesses

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UNITED STATES PATENT OFFICE.

JESSE E. RODKEY AND ERNEST C. FARRAR, OF AXTELL, KANSAS; SAID RODKEY ASSIGNOR TO ROBERT K. FARRAR.

PROGRAM-CLOCK.

1,051,765. Specification of Letters Patent. Patented Jan. 28, 1913.

Application filed August 17, 1911. Serial No. 644,680.

To all whom it may concern:

Be it known that we, JESSE E. RODKEY and ERNEST C. FARRAR, citizens of the United States, residing at Axtell, in the county of Marshall, State of Kansas, have invented a new and useful Program-Clock, of which the following is a specification.

This invention relates to school grade clocks.

The object of the invention is to provide an apparatus of this character, adapted more particularly for use in schools having the high school and the graded schools in one building, in which the division of time may be accurately divided, and the different rooms notified of the hours of session, or the beginning of studies or recitations.

A further object of this invention is to construct the apparatus in such manner that only one set of batteries will be needed in its operation, thus effecting a large saving in the use of the system.

A still further object of this invention is the provision of an electrical contact forming means carried by or operably connected with the minute hand arbor of a clock, whereby at different periods the circuits are made and broken to give certain alarms in the respective rooms where desired, so as to indicate the various endings or beginnings of periods of study or recess, throughout the day, various periods being regulated as desired, but as before stated the entire circuit making and breaking device being operable from and controlled entirely by the operation of the minute hand arbor of the clock.

With the above and other objects in view, as will appear as the nature of the invention is better understood, the same consists in the novel construction and combination of parts of a school grade clock, as will hereinafter be fully described and claimed.

In the accompanying drawings—Figure 1 is a diagrammatic view of the system, the period changing switch being in elevation and in its reversed positions. Fig. 2 is a side elevation of the drum with the carriage at the left side thereof. Fig. 3 is a top plan view thereof. Fig. 4 is a detail perspective view of the carriage, *per se*. Fig. 5 is a detail perspective view of the carriage lifting and guiding device. Figs. 6 and 7 are views showing the cam plate carried by the rotary drum for assisting in starting the contact carrying carriage in the reverse direction.

Referring to the drawings, A designates the base, carrying the clock works or mechanism C, and the dial D, the minute hand arbor 100, having rotatably mounted thereon between the works and the dial, a drum 1, made of insulation, preferably hard fiber or vulcanite, the said drum having its ends closed by the disks 1′, of the same material. The exterior of the drum is threaded and in reality forms a feed screw the outer edges of the threads being square and preferably made at No. 8 pitch.

By having the drum rotated by the minute hand arbor of the clock, the said drum is rotated once every hour, and at all times is in step with the minute hand of the clock. Disposed to oscillate back and forth longitudinally of the drum upon the rod or shaft 3, is a carriage, consisting of a long curved arm 2, carrying at its respective ends the upstanding blocks 4 and 5 of insulation, while carried by the curved arm 2 intermediate of its ends and projecting above and below the same are the oppositely disposed styli 6 and 7 respectively, the stylus 6 being adapted to normally fit within the groove between the threads upon the exterior of the drum 1, during the passage of the carriage caused by the rotation of the drum from left to right as viewed in Figs. 2 and 3 or in other words from movement in the direction from the clock works toward the dial.

The shaft 8 carrying the feed screw 8′ is disposed within the frame-work above and parallel with the shaft or rod 3 and receives motion through the gears 9 and 10, whereby the said screw 8 is rotated simultaneously from the minute hand arbor of the clock with the drum 1. Carried upon the outer free end of the curved arm 2 is a plate 32, whose outer free end projects beyond the extreme end of the curved arm 2 and is bent slightly upwardly so as to not contact the surface of the drum 1, but yet

when the stylus 6 has entered the end of the threads at the extreme right of the drum, the cam plate 31 will engage the underside of the plate or arm 32, imparting to the curved arm 2 an upward movement with the shaft 3 as its center causing the extreme end of the arm 32 to enter the outer notch 33′ of the cross bar and guiding plate 34, so that the outer free end thereof, the stylus 6 having been disengaged from the threads of the drum and the stylus 7 having engaged the threads of the feed screw 8′, will be fed in the opposite direction, that is from right to left as viewed in Figs. 2 and 3, the outer free end of the plate or arm 32 resting upon the flange 34 of the guide plate, thus retaining the stylus 7 in engagement with the feed screw 8, until the feed screw 8 has been rotated sufficiently to have returned the curved arm 2 and its depending parts, until the free end 32 enters the inner notch 33, in guide plate 34, at which time the curved arm 2 will fall by gravity, causing the stylus 7 to become disengaged from the feed screw 8 and permit the stylus 6 to enter grooves formed by the threads upon the exterior of the drum 1. The rotation of the drum continues at all times so as to cause the feed screw 8′ to oscillate the carriage from left to right and from right to left, the purpose of which will presently appear.

Pivoted to the block of insulation 5 and carried bodily with the carriage as at 12, is a catch or movable member of a circuit breaker, a contact 13 being carried by the lower end of the block of insulation 5 and disposed to make contact with the free end 11′ of the pivoted member or timing piece 11, the lower end 11′ thereof being adapted to engage the outer face of the threads of the drum and engage the respective circuit completing means or pins carried by said drum, and which will be described in detail. In order to normally hold the lower end of the device 11 in contact with the terminal 13, a spring 14 and rod connection is disposed between the upper end of the block of insulation 4 and the upper end of the pivoted circuit breaking device 11, the spring exerting a tension outward so as to hold the lower end of said device 11 inward and in contact with the contact terminal 13. The tension of the spring 14 may be varied by means of the adjusting nut 15, as the rod 14′ is threaded a short distance to permit the movement of the nuts thereupon.

Disposed concentrically upon the end 1′ of the drum 1 are the three rings or contact plates 16, 17 and 18, respectively, and adapted to bear against the respective rings are the brushes or spring contact arms 19, 20, and 21 respectively, the same being connected to and disposed from the bar 22 of insulating material. Leading from the respective contact plates are the conductors 23, 24 and 25, the circuits of which they are members being clearly shown in diagram in Fig. 1, and will be more particularly set forth in describing the operation of the device.

Carried upon the periphery of the drum and in path of the lower end 11′ of the circuit breaking device 11, are a series of pins or contact points 26, 27, 28 and 29 respectively, the respective inner ends of which are connected by short wires within the drum as clearly shown in Fig. 1, to the respective rings 16, 17 and 18, whereby when either one of the said points are engaged by the circuit closing member 11, the circuit is completed through the respective rings of the drum and one of the contact plates 19, 20 or 21, the conductor 30 being connected directly to the minute hand arbor of the clock, and forming the return wire for any one of the three contact plates and rings. Connected to the terminal 13, is the conductor 60, which is connected to the battery 64, the line wire 30 being connected through the wire 66 to the other side of the battery 64 as clearly shown in diagram in Fig. 1. It will thus be seen that as the drum 1 revolves and causes the carriage carrying the contact and circuit breaking device 11 to be moved from left to right, so that the various points 26, 27, 28 or 29 will come in contact with the lower end 11′ of said device and thereby establish a circuit with said battery 64 therein, to ring the gong 55 or the various recitation bells 56, 57 and 58, although it is to be understood that any number may be employed. All of the contact points 26, are connected to the minute hand arbor shaft 100 and form a gong ringing circuit.

Referring to the diagram, Fig. 1, and supposing the switch 42 to be in the full line position with its lower end engaging the contact point 24′, the circuit closed to ring the bells 56, 57 and 58 is as follows: the batteries 64, conductor 60, the circuit maker and breaker 11, the lower end 11′ thereof, the pin 28, the ring 17, the spring plate 19, the conductor 24, the contact 24′, the switch 42, the conductor 65, the bells 56, 57 and 58, and the conductor 66. Assuming that the switch 42 is moved to have its lower end engage the contact point 23′, with the contact plate 47, which is carried by and insulated from the switch 42, bridging the contacts *b*—*b*, and the armature 40 of the electromagnet 39 holding the switch in such position, a circuit to release the switch 42 and to simultaneously ring the hall bell 55 and the class bells 56, 57 and 58 is closed as follows: The batteries 64, the conductor 60, the circuit maker and breaker 11, the contact end 11′, the pin 27, the ring 16, the spring contact plate 21, the conductor 23, the con-

tact point 23′, the switch 42, the conductor 65, the class bells 56, 57 and 58, and the conductor 66. As the conductor 30′ is shunted from the conductor 23, and leads to one contact *b*, a shunt circuit to energize the electromagnet 39 and ring the hall bell 55 simultaneously with the above circuits is made as follows: the conductor 30′, one contact *b*, the contact plate 47 insulated from and carried by the switch 42, the other contact *b*, the conductor 30^a, the hall bell 55, the electromagnet 39 and the conductors 30^b and 66. Thus the hall gong is actuated and the switch 42 is released to assume the full line position simultaneously with the energization of the class bells 56, 57 and 58. The position of the switch when closing the contacts *b*—*b* will prolong the period, as for instance, ten minutes. Should it be desired to have the period prolonged, as for instance twenty minutes, the switch 42 is moved to have the plate 47 bridge the contacts *a*—*a*, and the circuit made to release the switch and ring the hall bell 55 would be as follows: the batteries 64, the conductor 60, the circuit maker and breaker 11, the contact 11′, the pin 29, the ring 18, the spring contact plate 20, the conductor 25, the contact point 59, the switch 42, the conductor 65, the class bells 56, 57 and 58 and the conductor 66. Simultaneously with this circuit, a shunt circuit including the hall bell 55 and the electromagnet 39 is made and is as follows: the conductor 30′, led from the conductor 25, contacts *a*—*a*, contact plate 47 carried by the switch 42, the conductor 30^a, the hall bell 55, the electromagnet 39, and the conductor 30^b which is shunted to the conductor 66. Thus the hall bell 55 and the electromagnet 39 are energized simultaneously with the energization of the class bells 56, 57 and 58, and the armature 40 due to the energization of the electromagnet 39 is operated to release the switch 42, which due to its spring 45 is moved to the full line position, and the periods of energization of the class bells 56, 57 and 58 are regular and as usual. It will thus be seen that the hall bell 55 and the electromagnet 39 are actuated through the medium of shunt circuits controlled by the contacts *b*—*b*, *a*—*a* and the metal plate 47 insulated from and carried by the switch 42. The hall gong 55, is actuated at desired regular intervals through the following circuit:—the batteries 64, the conductor 60, the circuit maker and breaker 11, the contact 11′, the pin 26, the conductor 30, the gong 55, and the conductors 30^c and 66.

From the foregoing it will be seen that the circuit including the conductors 30 and 30^c does not pass through the electromagnet 39 and therefore such electromagnet 39 is not affected when the current flows through such conductors.

It is evident that by mounting a circuit making and breaking device in operable relation with the minute hand arbor of the clock, that a series of circuits may be actuated at various times throughout the day, and that by use of the carriage in combination with the threaded surface of the drum 1, and the screw 8′ and styli 6 and 7, that the drum may be sufficiently large to actuate a period of five days, or during the school days, the period that the stylus 7 is actuated by the screw 8 that is when the carriage is in the raised position and is moving from right to left, being from the end of the weekly period to the beginning of the next week, that is from Friday afternoon to Monday morning. By this means it will be seen that signals are audibly sounded throughout the various school days, and not again actuated until the following term or beginning of the week.

In the drawings, the drum is equipped for operating a period of twenty four hours, that is the stylus 6, when engaging or traveling in the grooves of the drum being during the school period, while the period at which the frame is raised and moved by the stylus 7, and screw 8, is the night period.

What is claimed is:

1. The combination with a series of audible alarms, and a clock, of a drum actuated by the minute hand arbor of the clock, and provided with a series of electrical contacts, a series of electrical circuits including contacts of said drum and the audible signals, a carriage disposed with relation to the drum and operated thereby, a circuit breaker carried by said carriage and disposed for coöperative connection with the contacts of the drum for making and breaking the various circuits at predetermined periods, a switch common to all circuits but only closing one at a time, and an electromagnetically operated catch for locking the switch at a desired circuit point to prolong the first period and for cutting out the electromagnet when a circuit is established by the contact of the carriage and drum.

2. The combination with a clock, a series of electrical circuits and a series of audible alarms therein, of a drum of insulating material having a series of exterior screw threads upon the surface thereof, said drum being operably connected to the minute hand arbor of the clock, a series of contacts connected to the drum and in electrical connection with the circuits, a carriage disposed for oscillation with respect to the longitudinal axis of the drum, a feed screw disposed exteriorly of the drum and parallel to the axis thereof, said feed screw being operably connected to the minute hand arbor of the clock, to rotate in unison with the drum, means carried by the drum for lifting the carriage when moved toward the

end of the drum, two oppositely disposed styli the lower one adapted to normally engage the threads of the drum, means for receiving the end of the carriage when lifted to cause the other stylus to engage the feed screw to move the carriage in the opposite direction to the drum, a spring actuated switch for one circuit at a time, and an electro-magnetically operated catch for locking the switch to prolong the first period and for cutting out the electromagnet when a circuit is established by the contacts of the carriage and drum.

3. The combination with a clock, a series of electrical circuits, and a series of audible alarms, of a drum of insulating material operably connected with the minute hand arbor of the clock, the exterior of said drum being threaded, a series of electrical contacts carried by the exterior of said drum, a carriage disposed with relation to the drum and adapted to oscillate it longitudinally thereof, a feed screw operably connected to the minute hand arbor of the clock and disposed in parallel to the axis of the drum, means carried by the carriage for engaging the threads of the drum to cause the carriage to move in one direction and to engage the feed screw to move the carriage in the other direction, a circuit breaker in said circuits and adapted to engage the contacts of the drum, a spring actuated switch normally closing the regular interval circuit, and an electromagnetically operated catch for locking the switch in various positions to prolong the first period and for cutting out the electromagnet when a circuit is established by the contacts of the carriage and drum.

4. The combination with a clock, a series of electrical circuits and a series of audible alarms therein, of a drum of insulating material having a series of exterior screw threads upon the surface thereof, said drum being operably connected to the minute hand arbor of the clock, a series of contacts connected to the drum and in electrical connection with the circuits, a carriage disposed for oscillation with respect to the longitudinal axis of the drum, a feed screw disposed exteriorly of the drum and parallel to the axis thereof, said feed screw being operably connected to the minute hand arbor of the clock to rotate in unison with the drum, means carried by the drum for lifting the carriage when moved toward the end of the drum, two oppositely disposed styli the lower one adapted to normally engage the threads of the drums, means for receiving the free end of the carriage when lifted to cause the other stylus to engage the feed screw to move the carriage in the opposite direction to the drum, a circuit breaker in said circuits and adapted to engage the contacts of the drum, a spring actuated switch normally closing regular interval circuits and an electromagnetically operated catch for locking the switch in various positions to prolong the first period and for cutting out the electromagnet when a circuit is established by the contacts of the carriage and the drum.

5. In a make and break device, the combination of a rotatable drum the exterior surface of which is provided with screw threads, a series of circuit making contacts carried by said drum upon the exterior thereof at predetermined points, a carriage capable of a longitudinal oscillating movement with respect to the drum, a spring terminal contact carried by said carriage and adapted to engage at predetermined periods the contacts of the drum to establish circuits, a stylus carried by said carriage and fitting the threads of the drum, the rotation of the drum acting thereon to feed the carriage in one direction longitudinally of the drum, a feed screw operably disposed with relation to the drum and parallel to the axis thereof and adapted to rotate in unison with the drum, an eccentrically disposed plate carried by and upon the periphery of the drum to engage the stylus and raise the carriage to disengage the said stylus from the drum, another stylus carried by said carriage and disposed oppositely to the drum engaging stylus to engage the feed screw when the carriage is raised, and a plate disposed longitudinally and exteriorly of the drum adapted to engage the carriage when raised to retain the upper stylus in engagement with the feed screw to permit the carriage to be fed in the opposite direction and to release said carriage and permit it to fall by gravity, whereby said lower stylus of the carriage again engages the drum.

6. A circuit controlling device, comprising a rotatable exteriorly threaded drum of insulation, a plurality of circuit contacts carried by said drum, a feed screw operably connected to and rotatable simultaneously with the drum, said screw being disposed with its axis in parallel with the axis of the drum, a carriage having one end pivoted so that the body of said carriage is projected between the exterior surface of the drum and said feed screw, two oppositely disposed styli carried by said carriage intermediate of its ends, one of said styli through gravity being normally seated within the threads of the drum, an eccentrically disposed plate connected to the periphery of the drum and as a continuation of one outer end of the threads thereof and disposed to engage the lower stylus to elevate the free end of the carriage and present the upper stylus into engagement with said feed screw, and a guiding plate for the free end of the carriage disposed above the drum

and provided with a slot at one end to receive the free end of the carriage when elevated and a slot at the other end to permit the free end of the carriage to descend and simultaneously disengage the upper stylus from the feed screw and engage the lower stylus with the threads of the durm.

In testimony that we claim the foregoing as our own, we have hereto affixed our signatures in the presence of two witnesses.

JESSE E. RODKEY.
ERNEST C. FARRAR.

Witnesses:
C. M. TABOR,
E. A. GASTON.