

(No Model.)

2 Sheets—Sheet 1.

A. J. REAMS.
ELECTRIC PROGRAM CLOCK.

No. 492,971.

Patented Mar. 7, 1893.

Fig. 1.

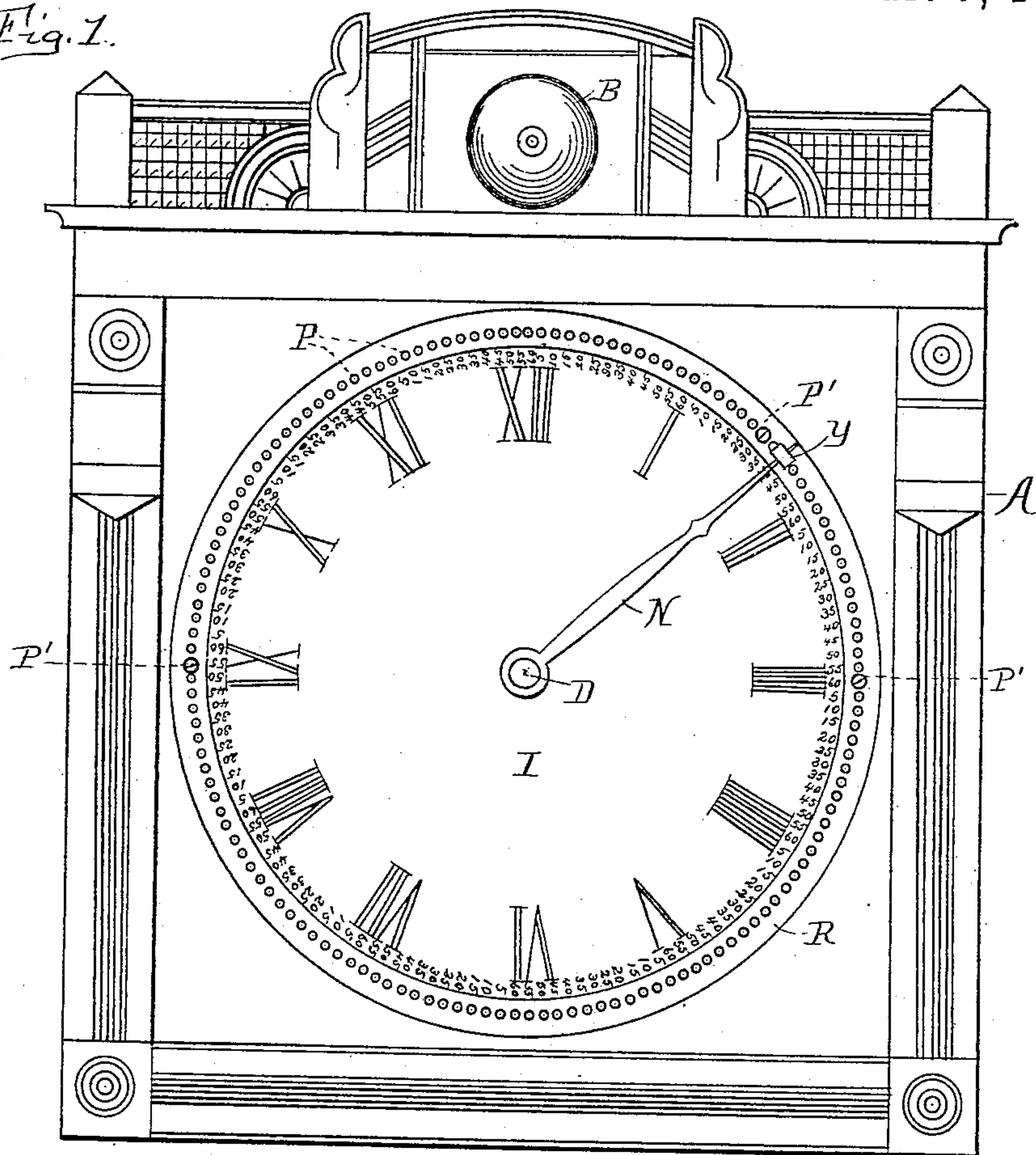
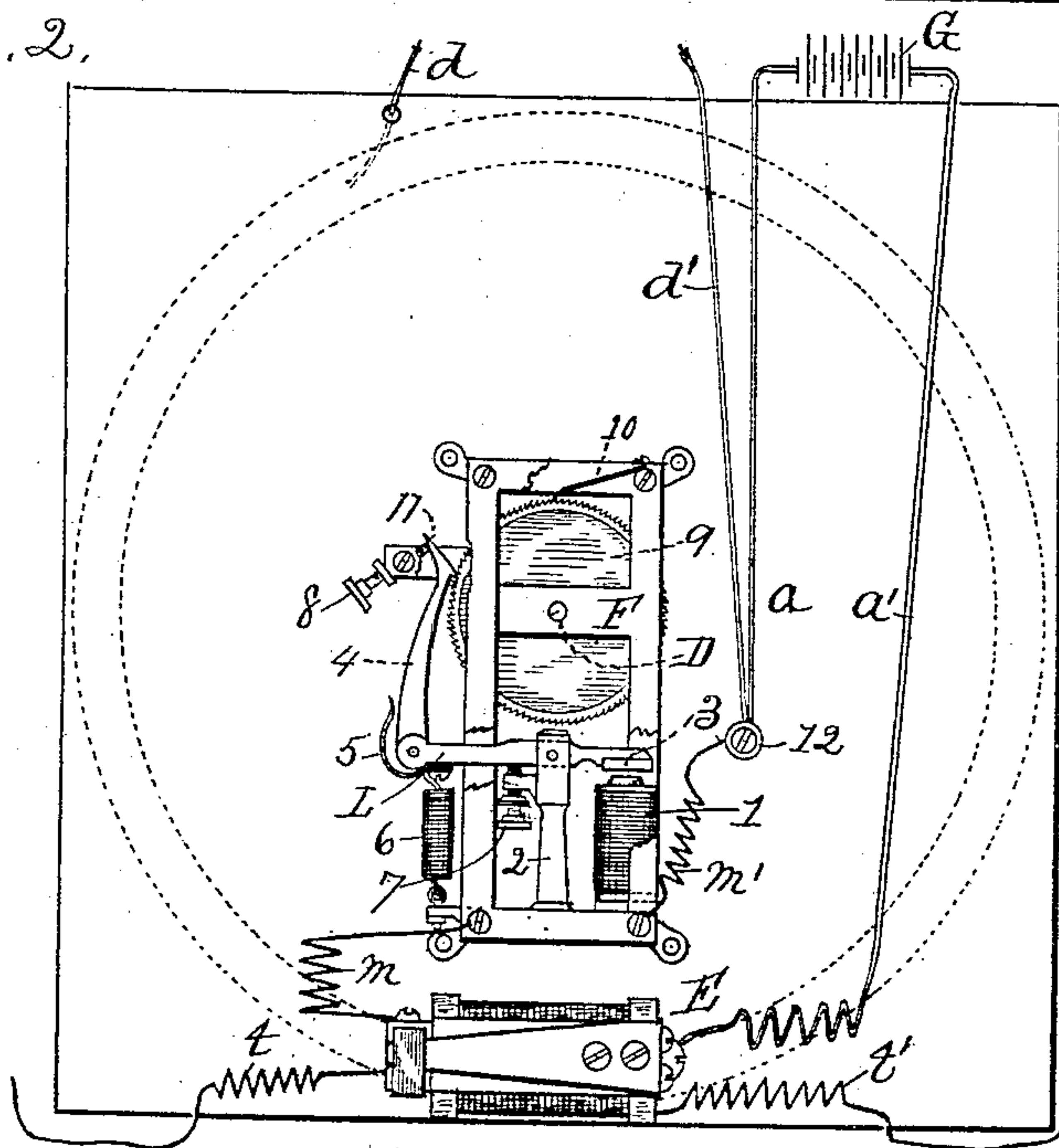


Fig. 2.



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UNITED STATES PATENT OFFICE.

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ELECTRIC PROGRAM-CLOCK.

SPECIFICATION forming part of Letters Patent No. 492,971, dated March 7, 1893.

Application filed August 3, 1891. Serial No. 401,599. (No model.)

To all whom it may concern:

Be it known that I, ANDREW J. REAMS, a citizen of the United States of America, residing at Wichita, in the county of Sedgwick and State of Kansas, have invented certain new and useful Improvements in Electric Program-Clocks and Annunciators, of which the following is a specification, reference being had therein to the accompanying drawings and the letters and figures of reference thereon, forming a part of this specification, in which—

Figure 1. is a face plan of the program annunciator, suitably incased. Fig. 2. a rear plan of the electrical mechanism thereof separate from the case. Fig. 3. a vertical cross-sectional view of the inclosing case and dial thereof and a side view of the electrical mechanism thereof. Fig. 4. is a view representing the program annunciators arranged into position as when in service and in communication with the clock mechanism through the agency of conducting wires. Fig. 5. is a detailed view representing a portion of a clock as constructed for service in connection with the electric program annunciators. Fig. 6. is a detailed side view of the relay of the annunciator mechanism.

This invention relates to certain improvements in an electric program annunciator, or what is known by some persons as a program clock, and has relation to that class of clocks in which electric bells or similar alarms are sounded at given intervals by means of mechanism for making and breaking an electric current or currents connected to the works of a clock, and contemplates certain improvements on devices of this class, and consists, to that end, in the improved construction and combination of parts in which the electric current operating the alarm, or alarms, is broken during the time the alarm or alarms are not wanted; and in which means are provided for making and breaking the electric current or currents, and for the improved operations of the mechanism for making and breaking the circuit or circuits, as hereinafter more fully described and particularly pointed out in the claims.

Referring to the drawings A represents a case made to accommodate therein the elec-

trical mechanism of the program annunciator, supports on the top or other suitable place, thereon is an electric alarm bell B, and has secured to its front a clock dial I divided into one hundred and forty four parts or annular divisions of five minutes each, which divisions are consecutively marked by minute indicating figures, as shown in Fig. 1., and about said dial has secured thereto a metal ring R having one hundred and forty four perforations P corresponding with the five minute divisions of the dial.

Aside from the electric alarm bell, the electrical mechanism, of the annunciator, consists of a local circuit, and of a relay E, of the ordinary construction; for opening and closing the local circuit, the construction of the said circuit mechanism being as follows.

F is a frame secured to the front wall within case A.

1 represents an electro-magnet supported by the frame as is likewise supported a post 2 adjacent the electro-magnet.

3 represents an armature secured to a lever L which lever is fulcrumed to post 2 and properly holds the armature relative to the electro-magnet.

D represents an arbor suitably bearing in the frame, arranged extending forward through the dial I and bears on said extending end a hand or indicating pointer N which bears on its end portion a suitable metallic brush y adapted to move on its circuit with the hand, above or a distance from the perforations of ring R, and adapted to engage with pins or plugs P' which are removably set in said perforations. Said arbor bears, within the frame F a ratchet wheel 9 which is provided with one hundred and forty four ratchet teeth corresponding with the five minute division of the dial.

4 represents a pawl pivotally secured at its lower end to lever L and yieldingly held in contact at its upper end by means of the spring 5 which is secured to said lever, as shown. The upper end portion of said pawl is hooked so as to engage the ratchet wheel teeth when moved down, and pass the said teeth when moved upward, and is further provided with an opposite extending portion

11 which when the pawl is lowered engages with a set screw 8, which is made adjustable for the purpose of assisting in holding the pawl in engagement with the ratchet teeth 5 and preventing the pawl from slipping a tooth on its downward movement.

10 is a retaining spring pawl set to engage, at its free end, the teeth of the ratchet wheel to prevent rotation of the wheel in the wrong direction.

6 represents a retractile spring fixed at its lower end to the frame and at its upper end to lever L to yieldingly hold the armature from contact with the electro-magnets and to lower the pawl and thereby partially rotate the ratchet wheel at such times as the pawl has been moved upward.

7 represents an adjusting screw to regulate the throw of lever L and for that purpose is set in a bracket of post 2 below the lever and adjusted to engage with the lever.

The relay E is represented as located below frame F.

The electric bell B is represented as located on the case A with the mechanism thereof fixed to an ornamental top piece of the case and the sounding bell fixed to the face of said top piece; the sounding bell only being exposed to view from the front. However the arrangement of said bell is not essential. To one binding post of the bell an electric conducting wire *d* is arranged leading to and connecting with the dial ring R (see Fig. 2.) To the opposite binding post of the bell, is a second like conductor *d'* connected and arranged leading to and connecting a binding post 12 within the case, which binding post is connected to one terminal of a local battery G, by means of a conducting wire *a*. In the construction of this annunciator I prefer to locate said battery at the top of case A in rear of the ornamental top, in which position it is represented in Fig. 2. Also one terminal of the electro magnet 1 is connected with said binding post by means of the conductor wire *m'*; the other terminal of the said electro-magnet is electrically connected with the frame F by means of the conductor wire *m''* (see Fig. 3.) The other terminal of the local battery G is, by means of the conductor *a'*, connected to one wire of the make and break piece of the relay E and the other wire from the said make and break piece is connected to the frame F by means of the conductor *m*.

In Fig. 4, K represents a clock, for registering ordinary time.

In Fig. 5, K' represents a portion of said clock mechanism in which 13 represents the arbor of the minute hand of the clock, and this arbor is provided with a disk 14 having twelve forwardly projecting pins *e* on its rim and corresponding in position to the five minute division of time on the dial of the clock; on the third wheel arbor of the striking side of the clock is secured an eccentric shaped

disk 19 suitably arranged to engage the free end of a spring arm 20, which is secured to an insulated block 21, which block is secured to the clock frame; the clock movement being provided with the usual mechanism for releasing the striking train, and in this construction of disk 14, which being provided with the twelve pins *e*, instead of but one such pin as in the usual clock construction, the striking train is released every five minutes, instead of every hour as is usual, and the clock in this instance does not strike, the hammer and striking wheel being dispensed with, but instead it causes the main line circuit, which is represented at *w w'* and *w''* having interposed therein a battery H, and which conductor lines connect, one, shown at *w*, to the contact spring 20 of the clock, and one shown at *w''* to the clock frame at one terminal and to the main battery H at the other terminal, to be closed and opened for very short intervals every five minutes as the clock runs; being closed when the disk 19 is in contact with the spring arm 20, during the rotation of said disk at intervals of five minutes; thus closing and opening all the relays on the main line, of which there would be as many as there would be program annunciators in the several rooms of a building where used. One main line conductor *w* leads from the main battery H and runs parallel with line *w'* throughout the building where the annunciators are located and at their terminal said wires connect together thus forming a circuit line, and the relays of the annunciators in service are respectively connected with said main lines, through the agency of their conductors *t* and *t'*, in parallel as, shown.

The operation may be described as follows. As the time clock runs the striking mechanism, or in this instance, the transmitting side of the clock will be released every five minutes and will cause the eccentric disk 19 to make one revolution every five minutes; thus said eccentric disk acts as a transmitter and is brought in contact with the contact arm 20 at each such rotation, being in such contact a short interval at each rotation, and when in such contact the circuit is completed through the main line, and vitalizing each relay so placed on the line attracting the armature of each relay thereby closing the circuit of the local battery. Now it will be obvious that if a plug P' is inserted in the metal ring R of an annunciator, corresponding to any given time, and the brush *y* of the hand N is in contact with said plug, the bell circuit will be completed, through the medium of the hand N, the arbor thereof the frame F, the perforated ring R and the conducting wires, and the bell will be caused to ring, while the eccentric disk 19 is in contact with the contact arm 20 and as the said disk leaves the said contact arm contact is broken in the main line and

the relay magnets are demagnetized and their armatures are drawn away and the circuit in the battery is thus broken and the bell ceases to ring, and the electro-magnets 1 are demagnetized and their armatures are released and the retractile springs of said armature levers act to lower the end of said levers to which they are attached causing their connected pawls to act on their respective ratchet wheel and partially rotate said wheels at each such down movement of the pawls thereby at each such movement advancing the said wheels one tooth, thereby causing their arbors to likewise move and move the face hands N the space of five minutes each such move. This operation is repeated every five minutes, in accordance with the five minute division of the mechanism brought into service, and it is obvious that the time will be indicated by the hand N, of each annunciator, every five minutes and the alarm bell sounded on any time where a plug is inserted in a perforation of a ring R and the brush of the hand N brought in contact with such plug, so any number of rooms can be provided with an annunciator in each room, as in schools, and each annunciator having plugs set in its perforated ring R, corresponding with the program time of its respective room, and each indicate the time at intervals of five minutes, throughout the day, and announce the time of recitations and the like as laid out in the program for the day, by sounding the bell at the beginning and closing of each recitation, or arranging the plugs P' to cause the bell to sound at such time or times as may be desired relative to the program. By the construction described the annunciator hands make a complete circuit each twelve hours being moved a space each five minutes or twelve spaces each hour, or one hundred and forty four spaces each twelve hours, therefore it becomes possible to announce a recitation or recitations at intervals of five minutes or of any greater length of time during a day, by simply arranging the plugs P' to correspond with the time of announcing the recitations thus causing the bell to sound each time a plug is engaged by the hand brush.

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

1. An electric program clock and annunciator comprising, a case, a face dial, a perforated metallic face ring, a local battery, an electric announcing bell, a relay, an electro-magnet, an armature arranged to be attracted by said magnet, a lever arranged supporting said armature, a pawl connected with and adapted to be operated with the lever, a retractile spring arranged connecting the lever and adapted to actuate the lever and pawl when said electro magnet becomes demagnetized and releases the armature, an arbor bearing a ratchet wheel arranged to be engaged and actuated by the pawl, and also bearing a

hand having a metallic brush adapted to engage with pins or plugs set in the perforations of the face ring, with electric conductors for connecting said parts in the manner set forth; in combination with the main line conductors and battery thereof, and the transmitting mechanism of a clock, substantially as and for the purpose specified.

2. The combination with the clock provided with the transmitting mechanism, and with the main line conductors and battery thereof arranged connecting said clock mechanism and adapted to have the circuit intermittently made and broken by said clock mechanism, of the electric program clock and annunciator comprising a face dial, a metallic ring adjacent the dial, an arbor carrying a face hand having a brush or equivalent device for engaging with plugs or projections of said face ring, and a ratchet wheel in the rear of said dial, a pawl and lever mechanism for actuating the ratchet wheel and hand, a retractile spring, an electro magnet and armature for actuating the lever, and pawl; a local battery, an electrical bell; a relay for making and breaking the local circuit, and electrical conductors for connecting said parts in the manner and for the purpose substantially as set forth.

3. In the electric program clock and annunciator described, the combination of the main lines and battery thereof; the relay connected in parallel with said main lines; the electro-magnet electrically connected with the relay; the frame supporting the electro-magnet; the lever pivotally supported by the frame and carrying at one end the magnet armature, and at its opposite end the pawl, held upright to its work, by a spring; the ratchet wheel carried on the hand arbor, supported by the frame, and adapted to be engaged by the pawl; and the retractile spring arranged and connecting the lever, substantially as and for the purpose set forth.

4. In the electric program clock and annunciator described, the combination with the main line and battery thereof; the relay connected in parallel with said main lines; the electromagnet electrically connected with the relay; the lever carrying the magnet armature at one end, and the pawl at its opposite end; the retractile spring connected to hold down the spring; the ratchet wheel carried on the hand arbor, and adapted to be engaged and actuated by the pawl; the face indicating hand carrying a brush; the face ring arranged adjacent the path of said hand brush, and having studs or lugs adapted to be engaged by said brush during its circuit; and of the electric announcing bell electrically connected with said face ring, and with the electro-magnet, substantially as and for the purpose set forth.

5. The combination with the main line circuit, and local circuit, of a clock for periodically making and breaking said main line

circuit, a relay in said main line circuit for making and breaking said local circuit, electro-magnetic operating mechanism in the local circuit for moving an indicating hand, a
5 branch in the local circuit, one or more projections forming one terminal of said branch circuit, a brush carried by the indicating hand forming the other terminal, and a suitable

annunciator in the branch circuit, operated upon the contact of the brush with one of the projections, substantially as specified.

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