

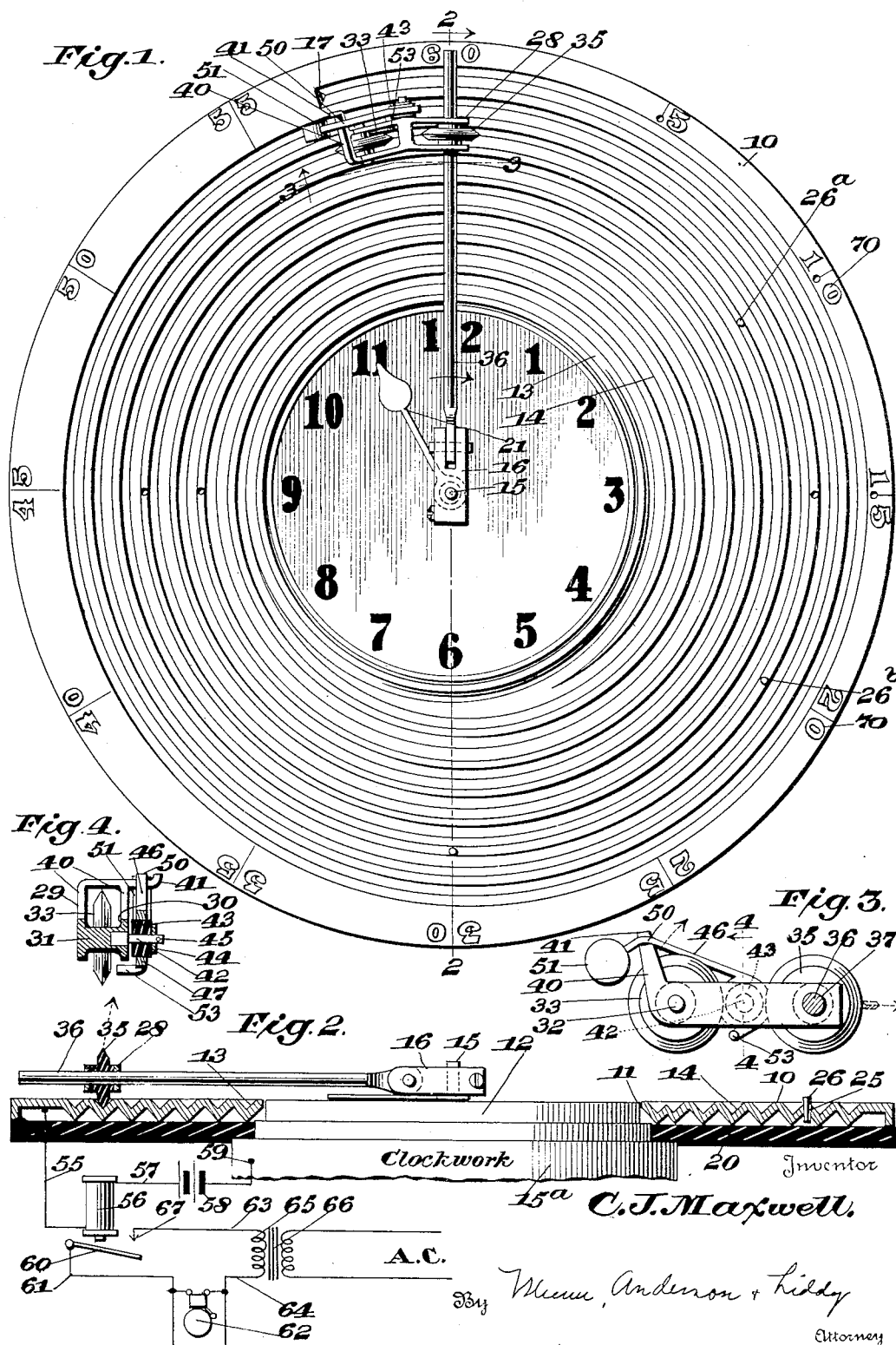
Feb. 4, 1936.

C. J. MAXWELL

2,029,667

PROGRAM CLOCK

Filed Sept. 25, 1935



UNITED STATES PATENT OFFICE

2,029,667

PROGRAM CLOCK

Charles Joseph Maxwell, Dallas, Tex.

Application September 25, 1935, Serial No. 42,096

6 Claims. (Cl. 161-4)

This invention relates to a program clock.

An object of the invention is the provision of a clock having a metal face provided with a spiral groove leading into an annular groove circumscribing the center of the plate, a swingably mounted hand having a sliding connection with a carriage being adapted to drive the carriage by means of wheels around the grooves so that pins forming contact members placed along the grooves will engage a contact on the carriage for closing an electric circuit to an alarm.

A further object of the invention is the provision of a program clock having a minute hand adapted to move a carriage along a spiral groove so that contact members on the face plate of the clock and adjacent a turn of the groove will engage a contact on the carriage guided by the minute hand for closing an electric circuit to an alarm after which the carriage will be moved inwardly towards the center until it is received by the annular groove where it will continuously encircle said groove until placed in another position for closing the circuit, said hand being swingable away from the face of the clock to permit the proper adjustment of the carriage in a groove.

Another object of the invention is the provision of a program clock having a spiral groove leading at one end into a circular groove which circumscribes the center of the face plate of the clock, the other end of the spiral groove terminating adjacent the periphery of the plate, the minute hand which is revolved by the usual mechanism of the clock guiding a carriage which is slidably received by the minute hand around through the grooves, the carriage being provided with a pivotally mounted lever having one end resting upon an arm on the carriage while the other end is provided with a finger adapted to engage removable pins placed at predetermined points along the spiral groove whereby an electric circuit is closed by the contact of the finger with the pin and then opened by the oscillation of the lever, the electric circuit being closed through the lever, the carriage, the minute hand, and the pins carried by the metallic face plate.

This invention will be best understood from a consideration of the following detailed description, in view of the accompanying drawing forming a part of the specification; nevertheless, it is to be understood that the invention is not confined to the disclosure, being susceptible of such changes and modifications as define no material departure from the salient features of the invention as expressed in the appended claims.

In the drawing:

Figure 1 is a plan view of the face of a clock constructed in accordance with the principles of my invention,

Figure 2 is a transverse vertical section taken along the line 2-2 of Figure 1,

Figure 3 is a fragmentary vertical section taken along the line 3-3 of Figure 1, and

Figure 4 is a transverse vertical section of the carriage taken along the line 4-4 of Figure 3.

Referring more particularly to the drawing, 10 designates a metal face plate having a central opening 11 which is closed by a clock dial 12 of the usual type. This face plate is provided with an annular groove 13 and a spiral groove, generally designated by the numeral 14. The annular or circular groove 13 circumscribes the center of the plate and the center of the annular groove is located within the longitudinal axis of a driving shaft 15 for a minute hand 16. The spiral groove at its inner end leads into the circular groove 13 and terminates at its outer end at 17 adjacent the periphery of the circular plate 10.

The metal face plate 10 is mounted upon a disc 20 formed of insulating material so that the plate 10 is insulated from the mechanism or casing of the clock. Clock works for operating the minute hand 16 and an hour hand 21 are located below the disc 20. If desired, the hour hand 21 may be dispensed with although the addition of the hour hand in no way affects the operation of the timing mechanism for controlling an alarm.

The annular groove 13 and the spiral groove 14 is shown V-shaped in cross section in Fig. 2 although these grooves may be of any suitable configuration.

At spaced points along the spiral groove holes 25 are provided in which pins 26 are adapted to be inserted as desired for a purpose which will be presently explained. The pins are formed of metal so that they will operate as means for closing an electric circuit shown in Fig. 2.

A carriage, generally designated by the numeral 28, consists of a pair of side bars 29 and 30 which are connected together at intermediate points by a pin 31. One end of the bars carries an axle 32 for a wheel 33 which is formed of insulating material and has its periphery shaped to be received by the annular groove 13 and the spiral groove 14.

A second wheel 35 is also formed of insulating material and has its periphery shaped to conform to the cross sectional area of the circular

groove 13 and the spiral groove 14. This wheel has a central opening adapted to receive a swingably mounted portion 36 of the minute hand 16. This hand also passes through openings 37 in one end of the side bars 29 and 30 of the carriage.

The rear ends of the side bars 29 and 30 are provided with upward extensions 40 to which is integrally connected an arm 41 which extends laterally from one side of the carriage.

A pin 42 is secured to the connecting member 31 and projects laterally from the central portion of the carriage and is adapted to receive an insulating washer 43. This washer is held in place by means of a disc 44 and a pin 45.

A lever, generally designated by the numeral 46, has a hub 47 adapted to receive the washer 43 whereby the lever which is formed of metal is insulated from the carriage 28. This lever has a portion 50 resting upon the arm 41 and is provided with a weight 51 beyond the arm for maintaining the upper portion of the lever in engagement with said arm.

At the lower end of the arm, and beyond the pivot pin 42, a finger 53 is provided which extends laterally inwardly and into the path of one of the pins 26 for rocking the lever as will be presently explained.

A wire 55 connects the metal plate 10 with a coil of a magnet 56. A wire 57 connects a coil with a source of current indicated at 58 of low voltage. The other terminal of the source of current, as shown at 59, is connected with the clock works.

An armature 60 is adapted to be operated by the magnet 56 when said magnet is energized. A wire 61 connects the armature with an alarm 62 while wires 63 and 64 connect a secondary coil 65 of a transformer 66 with one terminal of the alarm and with a contact 67 which is adapted to be engaged by the armature 60 for closing the circuit to the secondary coil 65.

The operation of my device is as follows: Openings 25 are placed at predetermined points along the spiral groove 14 and these may be numbered as shown at 70. The numbers 70 around the plate 10 represent periods of time that it will take the carriage to move from the outer end 17 of the spiral groove 14 to a particular pin which is in a line with one of the numerals.

If it be desired to ring the alarm of the program clock in one hour the wheels 33 and 35 of the carriage 28 are placed in the outer end of the spiral groove 14. Since the carriage is slidably mounted on the hinged member 36 of the minute hand 16 the minute hand may be moved outwardly from the face plate 10 and the carriage adjusted by sliding the same along the portion 36 of the minute hand until it reaches the outer end of the groove 14. When the wheels 33 and 35 contact with this outer end of the groove the minute hand will be in position to guide the carriage from the extreme outer end of the groove to the pin indicated by the numeral 26^a and which is along a radial line indicated by the numeral 1 at 70.

When the carriage reaches the position opposite the pin 26^a the finger 53 of the lever 46 will be engaged by the pin and close the circuit to the magnet 56 by means of the carriage 28, the swingable portion 36 of the minute hand 16, the clock mechanism 15^a, the finger 53 of the carriage, the pin 26^a, the metal face plate 10, and the wire 55. When this circuit has been closed the armature 60 will be drawn up into en-

gagement with the contact 67 whereby the circuit to the secondary coil 65 and the alarm 62 will be closed and the alarm will be operated.

The engagement of the pin 26^a with the finger 53 closes the circuit as has been described but continued movement of the minute hand will cause the lever of the finger 53 to press against the pin 26^a and thereby raise the lever 46 against the weight 51. Since the lever, however, forms part of the circuit between the carriage 28 and the pin 26^a, the raising of the lever will break the circuit since the lever, as has been previously explained, is insulated from the carriage and only has contact with the carriage through the arm 41.

When the carriage passes beyond the pin 26^a the weight 51 will lower the lever so that it will again rest on the arm 41 but the current has been broken since the pin is no longer in contact with the pin 53.

If it is desired to ring the alarm again within an hour's time the pin 26^b is placed in an opening of the face plate 10 so that when the finger 53 engages the pin the alarm will again be operated as has been previously described. If, on the other hand, no other pins are placed in the openings along the spiral groove, the carriage will continue to be guided by the swingable member 36 of the minute hand 16 until it reaches the annular groove 13 and it will continue in this groove 13 until the swingable arm 36 is raised and the carriage again placed within the outer end 17 of the spiral groove 14.

It will be seen by this construction that various periods of time for ringing the alarm may be determined in advance by the proper setting of the pins in the various openings in the face plate 10.

I claim:

1. In a program clock, a face plate, a driven shaft projecting through the center of the face plate, said face plate provided with a circular groove having its center in the shaft and a spiral groove surrounding the circular groove and leading into the said circular groove, a minute hand fixed to the shaft and having a hinged portion swingable outwardly from the face plate, a carriage slidably received by the hinged portion of the hand and having rollers received by the spiral groove, removable contacts adapted to be placed along the spiral groove, and a swingable contact on the carriage adapted to engage the removable contact for closing a circuit to an alarm.

2. In a program clock, a face plate formed of metal, a driven shaft at right angles to the face plate and having one end projecting through said plate, said face plate provided with an annular groove having its center in the longitudinal axis of the shaft and a spiral groove encircling said annular groove and leading into the annular groove, a minute hand fixed to the shaft and movable over the face plate, said hand having a hinged portion swingable outwardly from said plate, a carriage slidably received by the hand, rollers on the carriage received by the spiral grooves, contacts mounted in the plate at spaced points along the spiral groove, a contact on the carriage adapted to engage a contact on the face plate for closing a circuit to an alarm.

3. In a program clock provided with a metal face plate and a minute hand movable over said face plate, the plate having a spiral groove, a circuit closer in the form of a carriage provided with wheels constructed of insulating material

riding in the groove, the hand moving the carriage along the groove, a contact in the form of a lever pivotally mounted intermediate the ends thereof on the carriage, said lever being insulated from the carriage, pins adapted to be supported on the plate adjacent the groove, an arm on the carriage adapted to be engaged by one end of the lever for aiding in completing an electric circuit through the carriage and hand, a finger on the other end of the lever adapted to engage a pin for closing the circuit through the plate.

4. In a program clock provided with a metal face plate and a minute hand movable over said face plate, the plate having a spiral groove, a circuit closer in the form of a carriage provided with wheels constructed of insulating material riding in the groove, the hand moving the carriage along the groove, a contact in the form of a lever pivotally mounted intermediate the ends thereof on the carriage, said lever being insulated from the carriage, pins adapted to be supported on the plate adjacent the groove, an arm on the carriage adapted to be engaged by one end of the lever for aiding in completing an electric circuit through the carriage and hand, a finger on the other end of the lever adapted to engage a pin for closing the circuit through the plate, said lever adapted to be rocked when the finger passes over the pin for moving the first-mentioned end of the lever away from the arm for breaking the circuit.

5. In a program clock provided with a metal face plate and a minute hand, said plate having a spiral groove extending from a point adjacent the center of said plate to the periphery thereof, a circuit closer having wheels of insulating material riding in the groove, said closer being slidably received by the hand and provided with an arm, a lever pivoted on the closer and having one end resting on the arm, pins disposed on the plate along the spiral groove, a finger carried by the lever and adapted to engage a pin for rocking the lever and moving said lever away from the arm for breaking an electric circuit, the carriage, hand, lever and plate being included in the circuit.

6. In a program clock provided with a metal face plate, a minute hand having a hinged portion movable over the plate, said plate having a circular groove circumscribing the center of the plate and a spiral groove leading from the circular groove, encircling said groove and terminating adjacent the periphery of said plate, a carriage having a sliding connection with the hinged portion of the hand and provided with wheels adapted to ride in the spiral groove and be guided into the circular groove where it will ride continuously after leaving said spiral groove, and means on the face of the clock cooperating with the carriage, the plate, and hand for closing an electric circuit for an alarm.

CHARLES JOSEPH MAXWELL.