

Feb. 10, 1931.

E. F. GEIGER

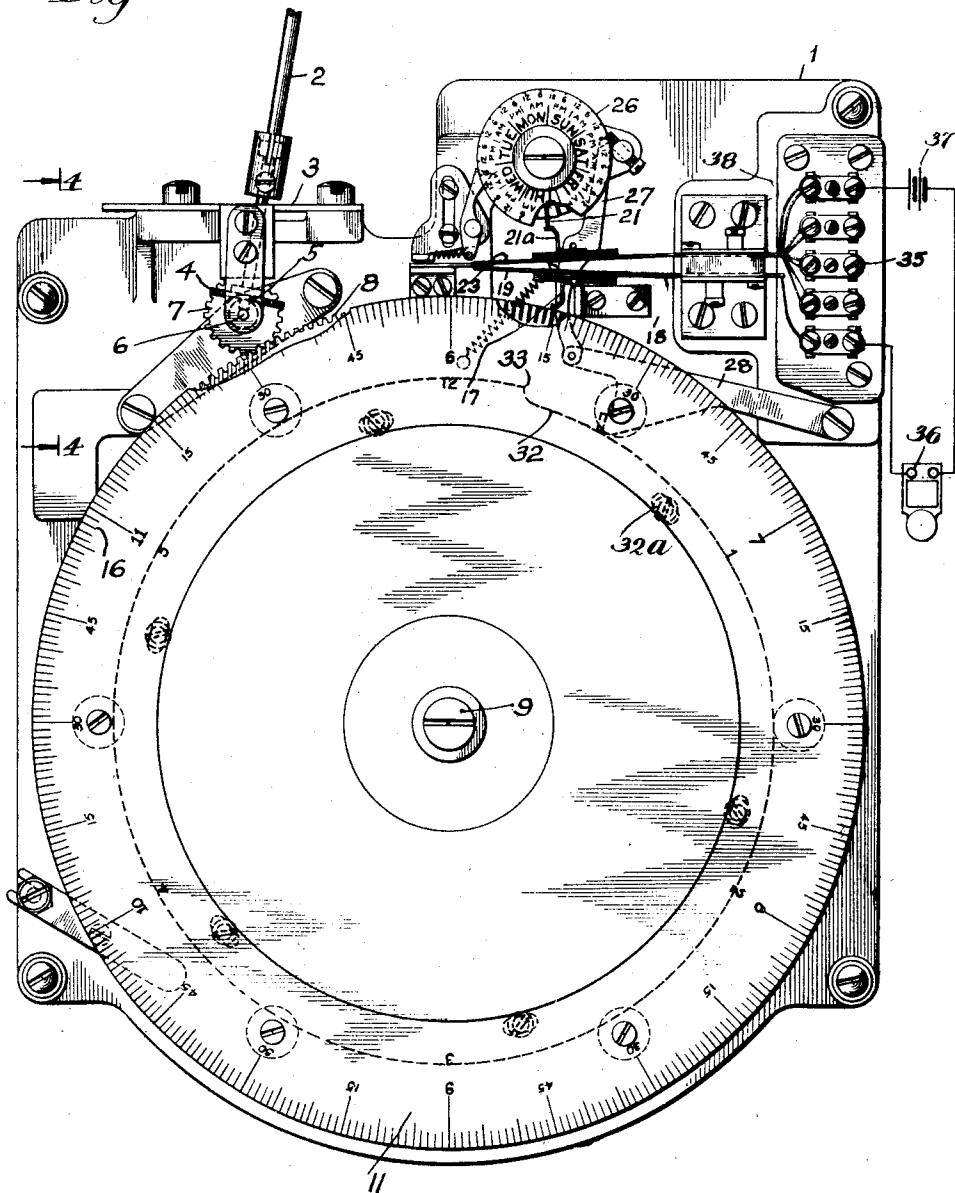
1,791,927

PROGRAM DEVICE

Filed Oct. 30, 1923

2 Sheets-Sheet 1

Fig. 1.



Inventor
Edward F. Geiger

By his Attorneys
Cooper, Kerr & Dunham

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Fig. 2.

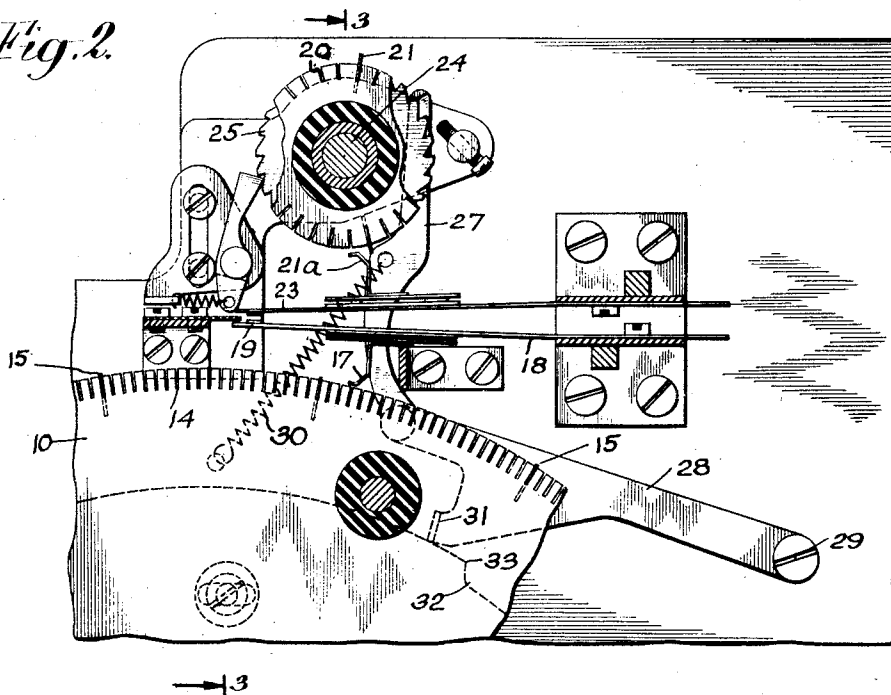


Fig. 3.

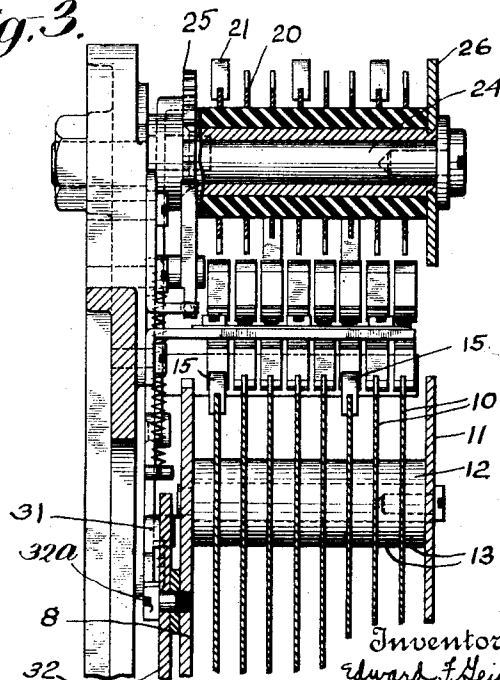


Fig. 4.

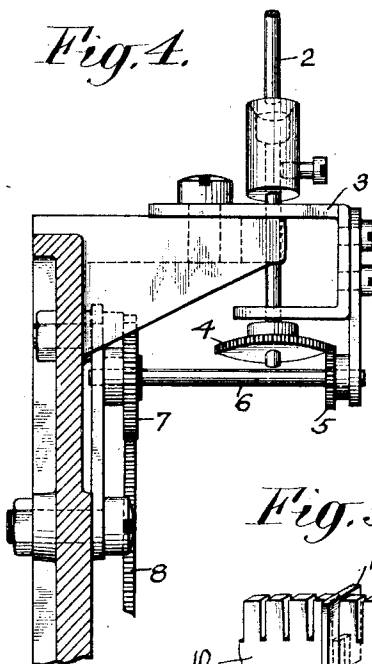
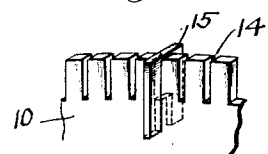


Fig. 5.



Inventor
Edward F. Geiger

By his Attorneys
Cooper, Kerr & Dunham

UNITED STATES PATENT OFFICE

EDWARD F. GEIGER, OF CHICAGO, ILLINOIS, ASSIGNOR TO INTERNATIONAL TIME RECORDING COMPANY OF NEW YORK, OF ENDICOTT, NEW YORK, A CORPORATION OF NEW YORK

PROGRAM DEVICE

Application filed October 30, 1923. Serial No. 671,686.

This invention relates to program devices or more specifically to time-controlled mechanism adapted to control signals at certain times during the day.

Such devices may be used wherever definite programs are followed—as, for instance, in schools, factories, stores, offices, etc.

This device may be set to cause the sounding of a gong or the production of any other suitable form of signal at any desired time by attaching electric circuit-controlling tabs to a time-controlled rotating disc. The disc may bear time graduations in suitable increments for convenience in locating the tabs.

Where a specific program requires the ringing of a bell at eight specific times during a given space of time, eight tabs will be placed on the disc at points corresponding to the times that the bell is to ring. As the disc rotates the tabs engage and actuate electric contacts at the proper moments, thus closing operating circuits and causing the signals to operate.

Several programs may be controlled by the same device by providing a separate disc for each program, each disc controlling the ringing of its bell or group of bells.

One object of the invention is to provide means whereby several discs, each representing a different program may interchangeably control the same signal or group of signals. Thus, when a class room is being used for morning, afternoon and evening sessions under three separate programs, the discs representing these three programs may at the proper times, be brought into control of the bell used for program control in that room. And, should the same room be used for a different program on Saturdays or Sundays, a different disc, brought into operation by the calendar device on such days, will control the bell.

The arrangement of the parts is such that a circuit operating a given signal may be associated with any desired number of discs. For instance, a device having eight discs may control two circuits; three of the discs being used to control one circuit and five to control the other. And any of the discs con-

nected with one of the circuits may be shifted to the other circuit.

Another object is to reduce the number of electric contacters through which the current flows.

Another object is to completely insulate the main body of the machine from the current being used.

Other objects will appear in the description which follows:

Referring to the drawings wherein I have shown what I now consider to be the preferred form of my invention:

Fig. 1 is a side elevation of the device.

Fig. 2 is an enlarged detail partly in section of a portion of the mechanism shown in Fig. 1, and shows the electric contact-actuating elements.

Fig. 3 is a sectional detail taken on line 3—3 of Fig. 2.

Fig. 4 is a sectional detail taken on line 4—4 of Fig. 1.

Fig. 5 is a detail of one of the time control discs.

In the drawings, 1 represents a supporting frame or casing for the mechanism, 2 represents a driving shaft which may be actuated by clock mechanism or any time-controlled element. The shaft is supported in bracket 3 and carries fixed on its lower end a gear 4 meshing with a gear 5 on a shaft 6. Gears 4, 5 may be of the bevel type or they may be ordinary clock gears wherein the teeth are so narrow that they will mesh and operate when mounted in different planes as shown here. The shaft 6 carries a gear 7 meshing with a large gear 8 rotatable about an axis 9. On the same spindle with gear 8 are a plurality of discs 10 and a dial 11. The gear, discs and dial are secured in spaced relation, as in Fig. 3, by suitable bolts 12 and spacing washers 13. The rotation of gear 8 will thus cause the discs 10 and dial 11 to rotate also.

The discs are notched, as at 14, at equally spaced intervals about their entire circumference to receive plugs 15 while the dial may be marked, as at 16, corresponding to the notches 14 to indicate their respective values in terms of time. The plugs are adapted,

as the discs rotate, to engage projections 17 on the lower leaves 18 of electric contacts 19, to close the contacts. The upper one of contacts 19, however, is normally sufficiently raised above the lower one to avoid closure when the lower one is raised. To permit closure, then, the upper contact must be slightly depressed. To accomplish this I have provided a second series of notched discs 20 adapted to receive plugs 21 to engage projections 21a on the upper leaves 23 of the contacts. The projections 17 and 21a are insulated from leaves 18 and 23. On the same shaft 24 with the discs 20 are a ratchet wheel 25 and a dial 26; the dial being marked to indicate the relation of the notches to the time of day and the day of the week. Cooperating with the ratchet is a pawl 27 pivoted lever 28 oscillating about a fixed axis 29. The pawl is pulled downwardly and against the ratchet by a spring 30. The lever 28 has a projection 31 riding on a cam 32 which is fixed to and rotates with the gear 8 and discs 10. As cam 32 turns counter-clockwise the pawl is slowly lifted, and once each revolution of the cam, the lever drops at 33 and spring 30 turns ratchet 25 one notch and with it the discs 20.

The operation is as follows:

The drive shaft 2 rotates the discs 10 counter-clockwise once every six hours. There being sixty notches for each hour, one of these notches will pass projections 17 each minute. Plugs 15 will be placed on the discs in as many places as it is desired to ring the bell during the six hours represented by the particular disc, and in positions corresponding to the times at which the bell is to ring. If the program represented by the disc in question commences between the hours of six and twelve each morning or the mornings of certain days, then a plug 21 will be placed on the disc 20 directly above and corresponding to the disc 10 in question at the point representing six o'clock in the morning of the days for which the program is operative. There are four of these notches for each day, one of which reaches the position adjacent projection 21a at the beginning of each quarter of the day. Thus, plugs placed in the second notch for certain days will engage projection 21a at six o'clock in the morning of those days and depress the upper one of contacts 19 to operative position. Thereafter, during the next six hours, whenever the lower contact is raised by a plug on the disc 10, it will engage the upper contact and close a circuit through the program bell and cause it to ring. The contact leaves 18, 23 are connected to binding posts 35 by means of flexible conductors of such a design that they can be easily disconnected from one post and connected to another. This will permit the leaves to be arranged in any combinations of groups as may be desired. The posts 35 may in turn, be connected to the signals as desired.

At the end of six hours, that is at twelve o'clock, the discs 20 will advance a notch and release the upper contact so that the disc 10 which has been controlling will have no further effect.

If the same class rooms are being used for morning, afternoon and evening sessions, three of discs 10 may be plugged up for the three programs respectively and the corresponding discs 20 plugged to depress their upper contacts 19 at six o'clock in the morning, twelve o'clock noon and six o'clock in the evening respectively. These three discs 10 will then, of course, be connected to the same program bells.

The connections may be made in the following manner: The lower contact arm 18 is connected through its binding post to one side of the signal device 36. The upper contact arm 23 is connected through its binding post 35 to the other side of the signal device; a suitable source 37 of current being, of course, included in the circuit. Where the program or programs require the use of more than one set of discs 10 and 20, the additional discs may be connected by connecting the proper contact arms 18, 23 to the same binding posts 35 to which the signal device 36 is connected. Loose connections 38 may be provided for this purpose. It is, of course, understood that several signal devices 36 may be connected to the same binding posts 35 to operate simultaneously.

If a program commences at 9 o'clock in the morning and ends at 3 o'clock in the afternoon, one disc becoming operative at six in the morning may be used for the nine to twelve period and another becoming operative at noon may be used for the twelve to three period.

Where a program commences at six o'clock in the morning and runs to ten o'clock at night, as is frequently the case in boarding schools, three discs will be used; one covering the period from six a. m. to twelve noon, another from twelve noon to six p. m. and the third from six p. m. to twelve at night. On the other hand, some boarding schools commence their programs at five in the morning, especially during the summer months, and run to ten at night. Heretofore with devices of this nature it has been necessary to use four discs for such a program; the extra disc coming into operation at twelve o'clock at night to operate for the period from five to six in the morning. I have provided a novel arrangement whereby such a program may be maintained with the use of only three discs. To this end, the cam 32 which is fixed with respect to the discs 10 and which controls the operation of the discs 20 to depress the upper contact arms 23 at six o'clock and twelve o'clock, may be adjusted to depress said arms at other hours. Thus, said cam is secured to the gear 8 by set screws 32a. Six

such screws are shown. By removing the screws and turning the cam in the proper direction one sixth of its circumference and reinserting the screws, the cam will now cause depression of the upper contact arms 22 an hour earlier. Now, if a plug 15 be lodged in the five o'clock notch of the morning disc, when the lower contact arm 18 is raised by such plug, contacts 19 will be closed and the signal operated. The discs will now be operative from five o'clock to eleven o'clock and from eleven to five.

It will be understood of course that by providing a sufficient number of holes for the set screws 32a the cam 33 may be adjusted in smaller steps, so as to bring the program discs into operation a half or quarter of an hour before six or twelve o'clock. Also, by providing an elongated hole or slot for the set screw 32a to engage in, the cam 33 may be so adjusted as to bring the program discs into control a half minute before or after the hour. Thus, if a program commences at precisely six o'clock, the discs can be rendered operative to control slightly before that moment. Or, where a program ends at precisely six o'clock, the disc may be retained in operative control until a fraction of a minute after that movement.

With my construction it will be seen that the discs may be variously plugged and variously combined for any desired program arrangements.

Heretofore in devices of this character it has been necessary to ground the apparatus itself for the common return. Inasmuch as the current used in connection with such devices is usually taken from the lighting or power circuits it will be realized that this is a serious matter. A very important feature of my invention, therefore, is the elimination of such grounding. This is accomplished by introducing the current through contact arms 18 and returning it through arms 22; the arms being insulated from the other parts of the machine, and the projections 17 and 21a carried by said arms being insulated therefrom.

My invention also reduces the number of points where the circuit is closed to one i. e., at contacts 19. In other devices of this character it has been necessary to close the circuit at several places.

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

1. In a program device, a signal control member, a plurality of time controlled means for actuating said member, and means controlled by one time controlled means for operating the other time controlled means, said means being adjustable relative to the first mentioned time controlled means to determine the time at which the second time controlled means shall operate.

2. In a program device wherein one time controlled means is actuated periodically by another to operate conjointly a signal controlling device, means for variably adjusting the time controlled means relatively to each other to vary the time of actuation of the first named time controlled means from the other and a clock driven member for driving the latter time controlled means.

3. In a program device provided with a signal control member and a pair of time controlled elements; a cam for driving one of said time-controlled elements and means for mounting said cam on the other time controlled element whereby the latter element controls the driving of the first mentioned time controlled element, said mounting means being adapted to mount said cam on the said latter element in different positions to provide a gross adjustment of the cam relative to the said latter element and said mounting means being adapted to permit a precise adjustment of the cam relative to the said latter element while the cam is in any one of said different positions on said latter element.

4. In a program device including a plurality of elements adapted to act conjointly to control a signal, separate time controlled means for controlling each of said elements, means for actuating one of said separate means from the other, means for grossly adjusting the time of such actuation, said means permitting minute adjustment of the time of such actuation after the gross adjustment has been made.

In testimony whereof I hereto affix my signature.

EDWARD F. GEIGER.