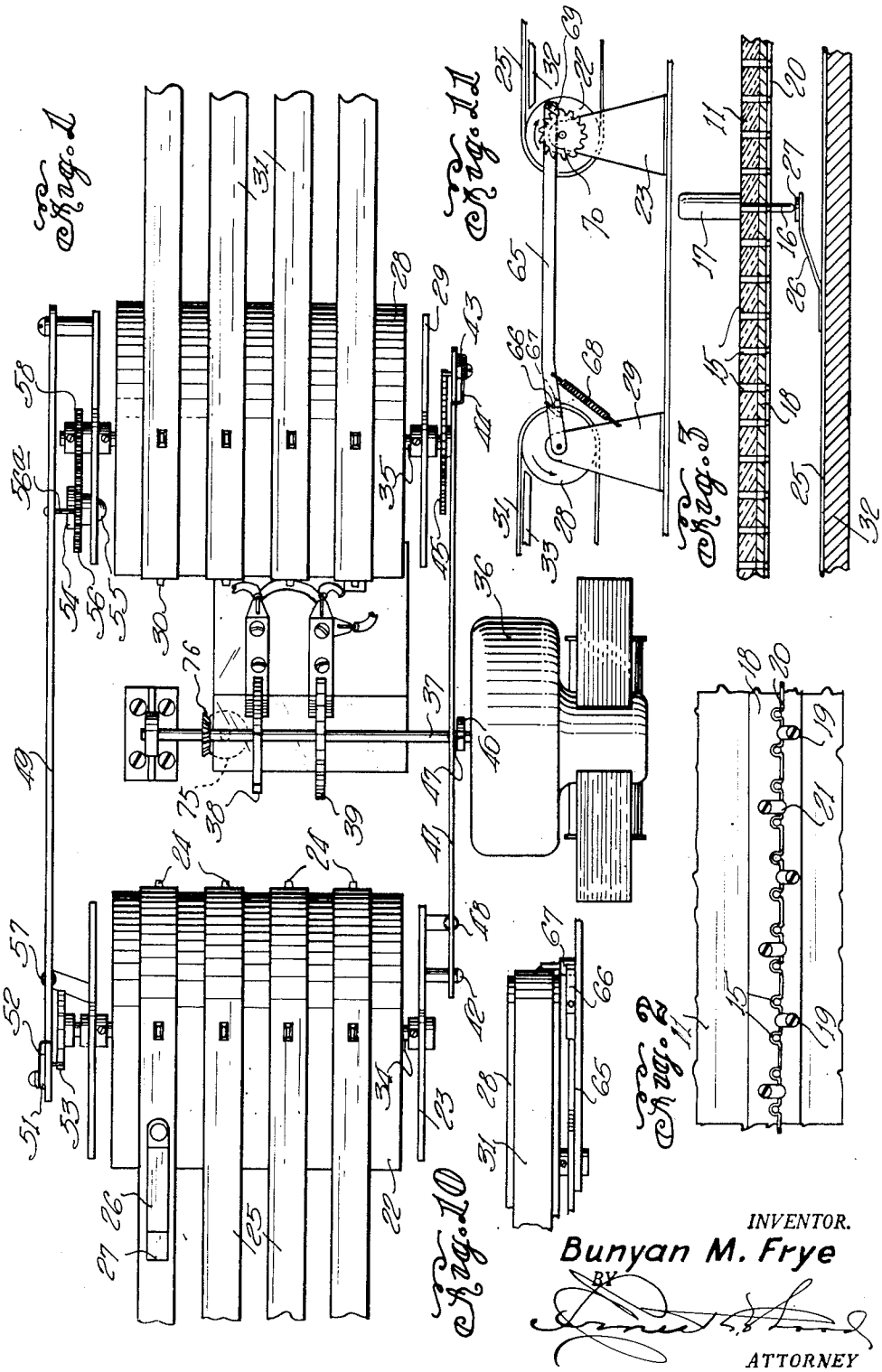
Jan. 13, 1953 B. M. FRYE 2,625,222

PROGRAM ALARM DEVICE

Filed Jan. 27, 1947 3 Sheets-Sheet 1



INVENTOR.
Bunyan M. Frye
BY
ATTORNEY

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PROGRAM ALARM DEVICE

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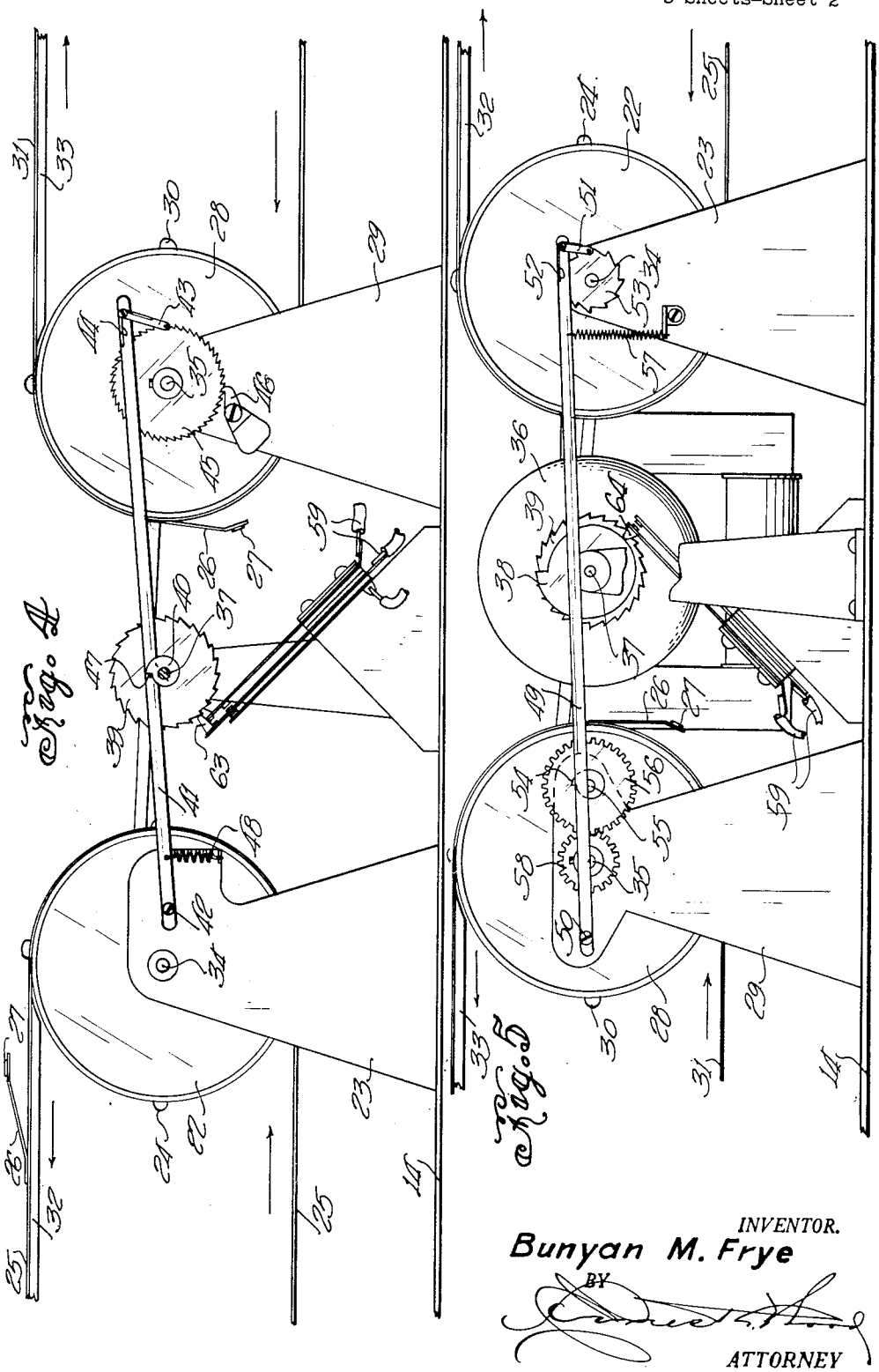


Fig. 4

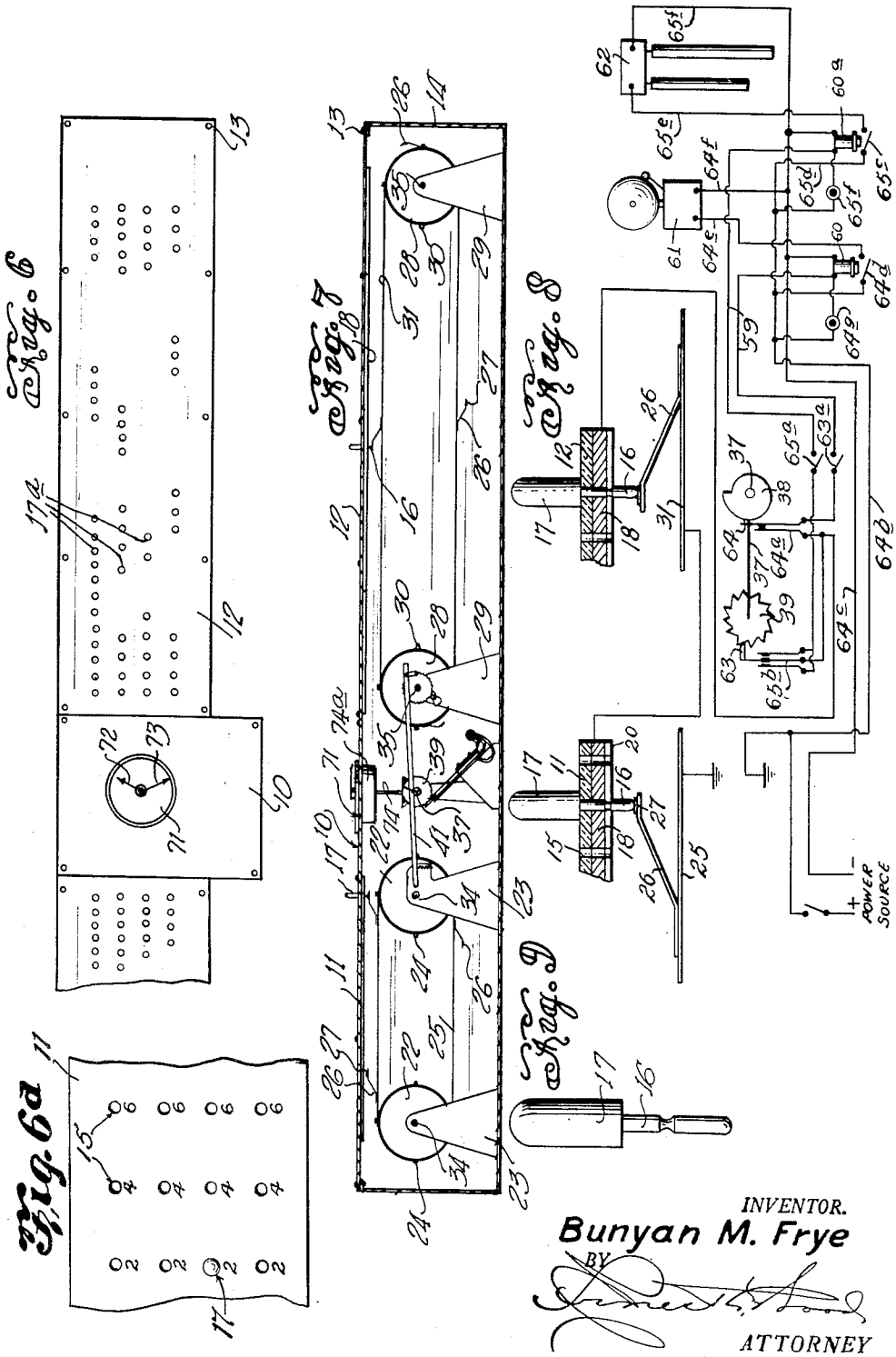
Fig. 5

INVENTOR.
Bunyan M. Frye
BY
ATTORNEY

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INVENTOR.
Bunyan M. Frye
BY
ATTORNEY

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PROGRAM ALARM DEVICE

Bunyan M. Frye, Dallas, Tex., assignor of forty-nine per cent to Hugh M. Frye, Sr., and Hugh M. Frye, Jr., both of Dallas, Tex.

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6 Claims. (Cl. 161—3)

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This invention relates to automatic program and alarm devices and more particularly to such devices adapted to maintaining signaling schedules of predetermined time intervals.

The principal object of this invention is to provide generally an enclosing cabinet of electrically non-conductive material, such as Bakelite, clock or suitable drive motor, or master clock control, or 1 R. P. M. electric motor, connected to a source of A. C. electric power and a series of endless metal ribbons encircling a plurality of drums, the latter being motivated by the action of the motor. The front panel of the cabinet contains two separate series of holes or jacks to receive contact plugs manually placed therein to produce signals predetermined by adherence to indicia upon the panel indicating hour and minute intervals throughout a twenty-four hour day.

Another object of the invention is to provide an automatic alarm or signal means adapted to manual settings of predetermined time intervals throughout a twenty-four hour period.

Another object of the invention is to provide an automatic alarm or signal means adapted to manual settings of predetermined time intervals throughout a twenty-four hour period.

A still further object of the invention is to provide means integral with the control for six-hour intervals for setting through a period of seven calendar days of twenty-four each, or intermediate periods to a maximum of one full seven-day week.

With the foregoing objects in view, the invention has particular reference to certain features of accomplishment which will become apparent as the description proceeds, taken in connection with the accompanying drawings, wherein:

Figure 1 is a fragmentary top plan view of a motor and tape supporting drums to illustrate their mutual relationship and means for coordinate movement.

Figure 2 is a fragmentary rear elevational view of the front panel to illustrate means provided for maintaining electrical contact when plugs are inserted at predetermined positions therethrough.

Figure 3 is a fragmentary sectional view of the front panel and the endless metal tape to illustrate means for obtaining contact between the plug and tape.

Figure 4 is a side elevational view, partly in section, to illustrate the inner construction details adjacent the motor.

Figure 5 is a fragmentary view of the side of

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the device opposite that shown in Figure 4 to illustrate the coordinating mechanism.

Figure 6 is a front elevational view of an alarm and signaling device constructed according to the invention.

Figure 6a is a fragmentary enlarged view of the front panel showing a jack in position in one of the holes.

Figure 7 is a side elevational view of the invention, showing the cabinet in horizontal section to illustrate the inner details of a complete unit.

Figure 8 is a schematic wiring diagram of an electrical circuit embodied in the invention.

Figure 9 is a detail view of one of the contact plugs shown on a large scale.

Figure 10 is a fragmentary plan view of a modified form of coordinating mechanism, and

Figure 11 is a side elevational view of the said modified form of coordinating mechanism.

Continuing with a more detailed description of the drawings it will be noted that the front of the cabinet as shown in Figure 6 comprises three separate Bakelite panels, a center panel 10 being a cover for a motor and electric switches hereinafter designated, an end panel 11 being a selector panel for two-hour intervals and so coordinated as to be a seven-day calendar device, and an opposite end panel 12, being a selector panel for one minute intervals of six-hour periods. These panels are secured in place by means of screws 13 extending through inwardly projecting portions of the foremost portions of the cabinet 14.

A series of perforations 15 through the calendar selector panel 11 are provided to permit the insertion of one or more plugs 16, each of the latter having a suitable means 17 for handling, made of dielectric material. Each row of perforations 15 have definite markings, not shown, indicating six hour intervals during one seven-day week, thus the four rows permit predetermined signal selection through one full week of seven twenty-four hour days.

Similarly, the one minute selector panel contains four rows 17a of three hundred sixty perforations each, the individual rows having definite markings, now shown, indicating one-minute intervals through one six-hour period, thereby permitting predetermined signal selection through one twenty-four hour day, the number of days and the specific days being predetermined by plugs inserted in the calendar selector panel 11.

Metal strips 18 are secured in spaced relationship to the backs of panels 11 and 12 by

means of screws 19, the latter also serving to hold a continuous wire 20 adjacent the metal strips 18 by overlapping clips 21. The wire 20 is looped at intervals into partial circles as shown in Figure 2, in concentric alignment with the perforations 15 in panels 11 and 12 and with similar perforations in the strips 18, the resultant combination forming jacks to receive and lock in place plugs 16 at spaced intervals.

The calendar device consists generally of two drums 22, axially supported by standards 23, each drum having lugs 24 protruding at diametrically opposed positions in each quarter of its circumference to engage spaced perforations through a series of endless metal tapes 25 operating on the drums 22. Each of the tapes 25 has a plurality of fixed arms 26 extending towards the panel 11, each carrying a contact point 27, thus being placed in position to make connection with the plug 16 (Figures 3 and 8), at various time intervals, as will be more fully explained hereinafter.

Similarly, the one minute selector mechanism comprises two drums 28, axially supported by standards 29, each drum having protruding lugs 30, as in the preceding description. A series of endless metal tapes 31 are constructed and maintained in position in like manner to those of the calendar mechanism. Fixed tables 32 and 33 provide rigid backing plates for the tapes 25 and 31 respectively in order to maintain the contact points 27 in proper relation to the plugs 16.

The drums 22 and 28 are mounted on shafts 34 and 35 respectively. A 1 R. P. M. or minute impulse motor 36 for master clock control is employed by rotating a shaft 37 between the adjacent drum shafts 34 and 35 at a predetermined rate of speed and on this shaft is mounted a signal duration cam 38. Also mounted on shaft 37 is a circuit energizing ratchet wheel, or multiple point duration cam 39. This shaft likewise carries on one end a smaller cam 40 (Figure 4). The purpose of each of the above mentioned elements, namely the cam 38, ratchet 39 and cam 40 will be presently described.

On one side of the described assembly is mounted an arm 41 (Fig. 4) one end of which is pivoted at 42 to a standard 23 while on its opposite end is pivoted a pawl 43, held by a tension spring 44 in engagement with the teeth of a ratchet wheel 45, mounted on the shaft 35 of the drum 28.

The ratchet wheel 45 is divided into 60 minute intervals, or in other words, it is provided with 60 teeth. A detent 46 holds the ratchet wheel against reverse movement after each impulse imparted by the arm 41.

To actuate the arm 41, the small cam 40, on the shaft 37 bears against a pin 47 on the arm, lifting the latter against the resistance of a spring 48 connecting the arm to a protuberance on the standard 23. This spring is effective to exert a downward force on the arm to rotate the ratchet wheel 45 is a clockwise direction through the medium of the pawl 43. Hence the drum 28 is rotated a proportionate degree to similarly displace the tapes 31.

On the opposite side of the device, an arm 49 is pivoted at one end at 50 to a protuberance on a standard 29. The opposite end of the arm carries a pawl 51, held by a spring 52 in engagement with the teeth of a ratchet wheel 53, mounted on the shaft 34 which carries the drum 22 over which operate the tapes 25 of the calendar unit. A small cam 54, mounted on the stub shaft 55 of a gear 56, raises the arm 49 through the medium of a pin 56a (Fig. 1) against the resistance of a spring 57 which is connected at one end to the arm 49 and at the other to the standard 23.

A gear 58 is mounted on the shaft 35 of drum 28 whose teeth engage those of the larger gear 56 and the ratio of these gears is such that a rotative impulse is imparted to the drum 22 each quarter cycle of tape 31 through the medium of the arm 49 and pawl 58 to operate the calendar unit once every six hours. It is understood, however, that the time intervals herein set forth are but arbitrary and may be altered to suit varying requirements of the program schedule device.

When a permanent schedule is desired, one or more plugs 16 are inserted in selected holes 15 in panel 11 of the calendar unit, and the relative spacing of the plugs 16 determines the duration of the period. By referring to Figure 8, it will be observed that in the course of its travel beneath the panel 11 of the calendar unit 11, one of the contacts 27 has engaged a plug 16 disposed in a preselected hole 15 in the panel. Actual closing of the circuit to the audible signals is effected in a manner to be presently described.

When a program schedule of a predetermined duration is to be set up, plugs 16 are inserted in the holes 17a of the minute panel 12. The holes 17a being spaced one minute apart, plugs inserted in, say, every fifteenth hole will denote a schedule of fifteen minute alarm intervals since the contact 27 on the tape 31 will engage first one and then the next succeeding plug as it travels the length of the panel from the top center of the drum 28 to that of the companion drum.

In operation, the signal 61, of the "buzzer" type which has a self contained breaker point, sounds when the normal switch 63a (Fig. 8) is closed, a pair of contact points 27 of tapes 25 and 31, simultaneously make contact with a pair of lugs 16 in the aperture 15 and the aperture 17a, respectively, of panels 11 and 12, and the cam 38 moves the cam follower 64 to close switch 64a and connect solenoid 60 across the conductors 64b and 64c. The solenoid 60, when energized, actuates the contact 64d and connects the buzzer or signal 61 across conductors 64b and 64c through the conductors 64e and 64f. The length of duration of the signal made by buzzer 61 is dependent on the shape of the cam 38. The solenoid 60 may also be energized by pressing the push button switch 64g which will connect the solenoid 60 across conductors 64b and 64c. Since energization of solenoid 60 causes contact 64d to connect the buzzer 61 across the conductors 64b and 64c, the buzzer may be sounded by pressing the push button switch 64g regardless of the position of contacts 27 of bands 25 and 31 with respect to the plugs 16 of panels 11 and 12, respectively.

The single stroke bell or chime 62 is sounded when the switch 65a is closed, a pair of contact points 27 of tapes 25 and 31 simultaneously make contact with a pair of plugs 16 in the apertures 15 and the apertures 17a, respectively, of panels 11 and 12, and the cam 39 moves the detent or cam follower 63 to close the switch 65b and connect the solenoid 60a across the conductors 64b and 64c. The solenoid 60a, when energized, actuates contact 65c and connects the chime 62 across conductors 64b and 64c through the conductors 65d, 65e and 65f. The chime will sound each time the cam follower is moved by a tooth of the cam 39 to close the switch 64b. The number of times the chime 62 sounds per revolution of cam 39 depends on the number of teeth provided on cam 39. Like buzzer 61, the chime 62 can be sounded at any time by pressing the push button 65f which connects solenoid 60a across

conductors 64b and 64c and causes contact 65c to be actuated to connect the chime 62 across conductors 64b and 64c.

It will be noted that if push buttons 64g or 64f are not pressed, the buzzer 61 or chime 62 will be connected across the conductors 64b and 64c only if the switches 63a and 65a, respectively, are closed and one contact 27 of belt 25 contacts a plug 16 in panel 11 and and a contact 27 of belt 31 contacts a plug 16 in panel 12 since conducting strips 18 of belts 25 and 31 are then only connected in series to complete the circuit of the buzzer or the chime across the conductors 64b and 64c.

Once a contact 27 in belt 25 contacts a plug 16 in panel 11, it will remain stationary a relatively long period of time since the gear 58 is smaller than the gear 56. The contacts 27 on a belt 31, therefore, can contact several plugs in panel 12 and cause the buzzer or chime to sound several times while the contact 27 of belt 25 remains stationary and in contact with a plug 16 in panel 11.

In Figures 10 and 11 is shown a slightly modified form of the arm 41, shown in Figure 4. The same characters of reference are used to indicate the drums of the calendar unit and minute register, as well as the tapes operating on the drums. The arm 65 carries an angular protuberance 66 which lies in the path of a roller 67 mounted on the tape 31, four of which rollers are so mounted at four equal space to come into contact with the protuberance 66 at one quarter cycles of the tape 31, thus to raise the arm 65 against the resistance of spring 68. Upon downward movement of the arm under the influence of spring 68 a pawl 69 will rotate the ratchet 70, which is the counterpart of ratchet 53 (Figure 5) to rotate the drum 22 according to a predetermined schedule for the calendar unit, as previously described.

Mounted in the center panel 10 of the cabinet is a conventional clock dial 71 over which operate hour and minute hands 72 and 73, respectively. These hands are operated by conventional clock mechanism 74a, shown in Figure 7, including a center shaft 74 which carries a bevel gear 75, enmeshing a companion bevel gear 76 (Fig. 1) mounted on the motor driven shaft 37. Through the medium of this clock mechanism, setting of the program schedule machine, as described, is facilitated.

Manifestly, the construction as shown and described is capable of some modification and such modification as may be construed to fall within the scope and meaning of the appended claims is also considered to be within the spirit and intent of the invention.

What is claimed is:

1. In an automatic signaling device: a pair of panels, each of said panels having a series of spaced apertures; a plurality of plugs insertable in preselected apertures in said panels; a first endless tape mounted for movement parallel to the series of apertures in one of said panels; a first means on said first tape for engaging plugs inserted in said apertures in said one of said panels; a second endless tape mounted for movement parallel to the series of apertures in the other of said pair of panels; a second means on said second tape for engaging plugs inserted in said apertures in said other of said panels; timed means for driving said tapes; an electrically actuated signal device; and means operatively associated with said panels and said tapes for connecting said signal device across a source of electrical energy each time said first and second means simultaneously engage plugs inserted in said panels.

2. In the device of claim 1; manually operable means operatively associated with said last mentioned means for connecting said signal device across said source of electrical energy when said first and second means do not simultaneously engage plugs inserted in said panels.

3. In the device of claim 1; said last mentioned means comprising a switch; and means operatively associated with said driving means for closing said switch for predetermined periods of time.

4. In an automatic signaling device: a pair of panels, each of said panels having a series of spaced apertures; a plurality of plugs insertable in preselected apertures in said panels; a first endless tape mounted for movement parallel to the series of apertures in one of said panels; a first means on said first tape for engaging plugs inserted in said apertures in said one of said panels; a second endless tape mounted for movement parallel to the series of apertures in the other of said pair of panels; a second means on said second tape for engaging plugs inserted in said apertures in said other of said panels; a timed driving means; means connecting said tapes to said driving means for causing periodic movement of said tapes, one of said tapes being moved more often than the other; an electrically actuated signal device; and means operatively associated with said panels and said tapes for connecting said signal device across a source of electrical energy each time said first and second means simultaneously engage plugs inserted in said panels.

5. In the device of claim 4; manually operable means operatively associated with said last mentioned means for connecting said signal device across said source of electrical energy when said first and second means do not simultaneously engage plugs inserted in said panels.

6. In the device of claim 4; said last mentioned means comprising a switch; and means operatively associated with said driving means for closing said switch for predetermined periods of time.

BUNYAN M. FRYE.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
513,262	Gerry	Jan. 23, 1894
704,108	Rice	July 8, 1902
2,215,842	Thomsen	Sept. 24, 1940
2,228,969	Osborn et al.	Jan. 14, 1941