

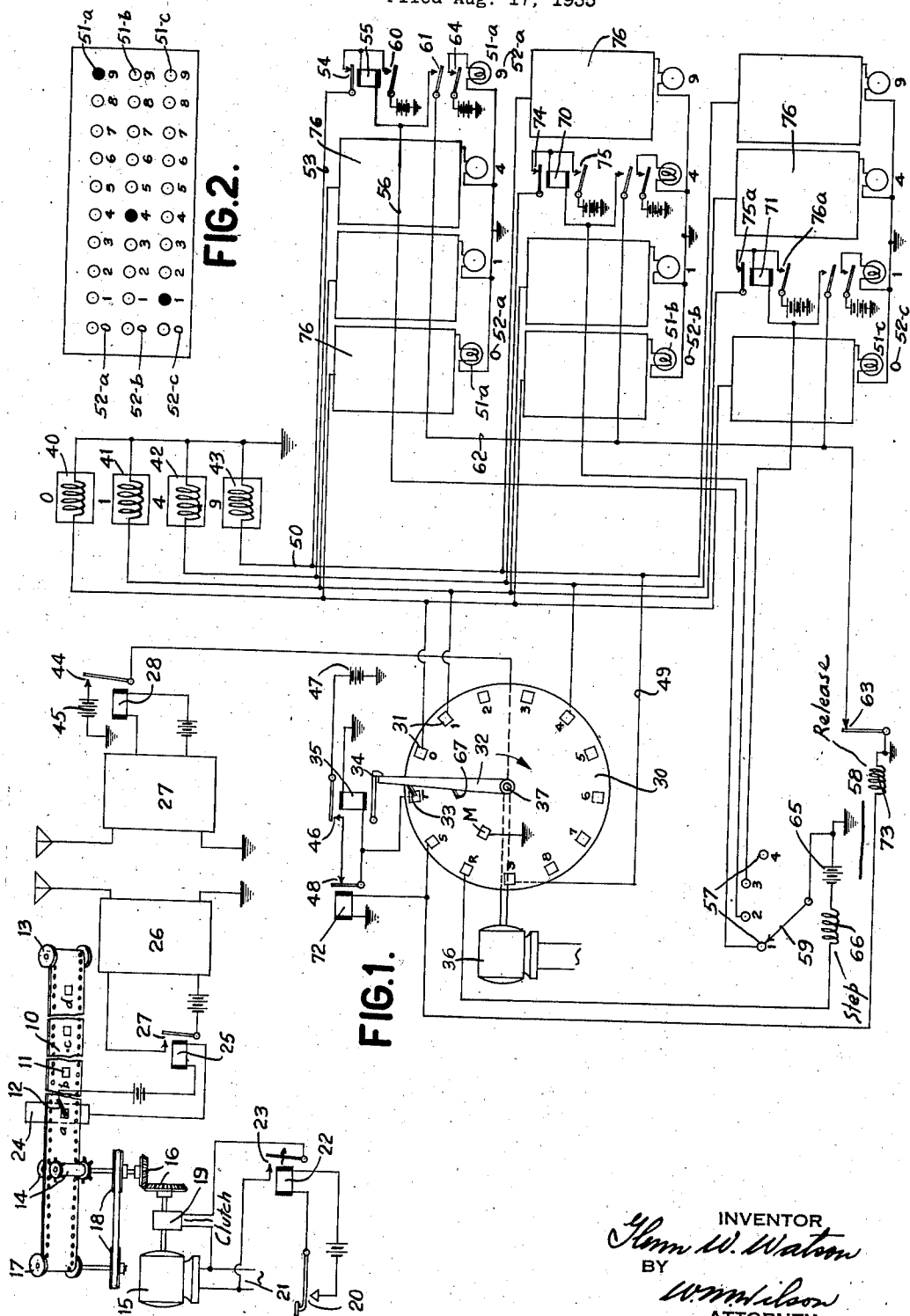
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SIGNALING SYSTEM

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SIGNALING SYSTEM

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This invention relates to signaling systems and more particularly to remotely controlled recording or indicating devices used in conjunction with alarm signaling systems.

5 The present invention is applicable to line or radio transmission for use in locations such as banks, offices, etc., whereby a single operation of a release key or switch automatically initiates predetermined signals which are transmitted to
10 a receiving station which may be in suitable locations such as police headquarters, offices, etc.

The operation of the release key at the sending station permits a pre-punched tape to be sensed to transmit signals at particular timed intervals. The signal representations of different indicia are differentiated by the transmission at the particular allotted timed intervals. The sensing of the tape causes a receiving station to be operated wherein a rotary distributor is released to operate in timed relationship with the transmitting tape. Provisions are made at the receiving station to record the signal representations or to operate indicating mechanisms such as a light bank or annunciator, etc.

25 It is an object, therefore, of the present invention to provide broadly for automatic signal transmission initiated by a release key whereby recording or indicating instrumentalities are automatically operated and upon completion of said transmission to automatically return the
30 system to normal condition.

Various other objects and advantages of my invention will be obvious from the following particular description of one form of mechanism
35 embodying the invention or from an inspection of the accompanying drawing; and the invention also constitutes certain new and novel features of the construction and combination of parts hereinafter set forth and claimed.

40 In the drawing:

Fig. 1 shows diagrammatically one embodiment of the automatic signaling system.

Fig. 2 shows a plan view of one form of indicating instrumentality energized to display the
45 received indicia.

Referring to Fig. 1, a pre-punched tape 10 is shown comprising a plurality of single perforations 11 arranged to be sensed by brush 12 in succession. The tape is fed from a supply roll 13
50 by the feeding rollers 14 which are adapted to be driven by a synchronous motor 15 or other suitable means through gearing 16. A take-up roll 17 is shown which may be rotated by the pulley arrangement 18. A friction clutch 19 is
55 designed to connect the motor shaft to gearing

16 whenever the release key 20 is depressed. In the embodiment shown, the motor 15 connected to supply source 21 is rotated continuously, so that upon depression of key 20 the relay 22 is energized to close the circuit to clutch 19 through its contacts 23, the motor effecting feeding of the punched tape. Relay 22 is a timed delay type so that the contacts 23 remain closed for a predetermined time even though the key 20 is depressed momentarily. The predetermined
10 timed interval the contacts 23 remain closed depends upon the particular installation, however it is desired that such interval is long enough to permit the pre-punched signals to be completely sensed and transmitted.

It is obvious that this control circuit may be altered so that the motor is not operated continuously but can be cut-in and connected to the supply source by the depression of key 20 and thus feed the perforated tape. Employing this method the friction clutch 19 is not necessary.

Sensing of the perforations by brush 12 and conducting plate 24 completes a circuit to relay 25 thus actuating a signal transmitter 26 through the operated contacts 27.

The transmitted timed signals actuate a signal receiver 27 to energize a control relay 28 accordingly. Associated with the receiver 27 is shown a rotary distributor 30 comprising a plurality of conducting segments 31 adapted to be engaged successively by rotary arm 32 and brush 33. The rotary arm 32 normally is held from rotation by latch 34 controlled by relay 35. Upon operation of relay 35 the released arm 32 is adapted to be rotated by a continuously rotating synchronous motor 36 through a friction member 37 so long as the relay 35 remains energized to maintain the latch 34 in an operative position, that is, out of the path of arm 32.

Motor 36 is energized by the same supply source energizing motor 15 so that both motors can be adapted to operate in synchronism. Therefore, by positioning the perforations at predetermined positions and in accordance with the allocation of contact segments 31, the indicia
45 transmitted by representative signals from the sending station will be received and reproduced or indicated in accordance therewith.

For example, let it be assumed that perforation 11—a sensed by brush 12 is adapted to transmit a signal to release the rotary arm 32 normally at rest on contact segment 31—T and perforation 11—b upon analyzation the sensing position is adapted to represent the numeral 9 and is sensed by brush 12 at a timed interval.
55

after the sensing of the perforation 11-a, and equivalent to the timed interval required by the rotary arm 32 upon its release to engage contact segment 31-9. Similarly assume that perforation 11-c and 11-d represent characters 4 and 1, respectively, so that upon analyzation of perforation 11-c the rotary arm engages contact segment 31-4 during its second revolution, and upon analyzation of perforation 11-d the rotary arm engages contact segment 31-1 during its third revolution. It is seen, therefore, that the spacing of the perforations 11 corresponds to the spacing of the contact segments 31 on the distributor 30 and due to the synchronous operation of the motors 15 and 36 the sensing operation or analyzation of the perforations is in timed relationship with the operation of the distributor 30. From the foregoing, it is understood that the perforations 11-a to d represent a start signal and a numerical representation 941.

Associated with the distributor 30 and connected to the contact segments thereof are various controlled instrumentalities to translate the signal representations and may comprise recording, punching, annunciating or indicating instrumentalities, etc. It is deemed sufficient to show and explain but a limited number of such receiving devices. Solenoids 40 to 43 are connected to several of the distributor contacts 31 which may be adapted upon energization to operate the keys of devices such as punches or typewriters, etc., further disclosure of which is deemed unnecessary since a complete description of such a recording device is set forth in a co-pending application Serial No. 677,018, filed June 22, 1933, Patent No. 2,066,786 dated January 5, 1937.

Referring again to the sending unit, it was described that upon depression of the release key the prepunched tape 10 is fed forward to the sensing brush and in the sensing position let it be assumed that a start signal perforation is analyzed such as 11-a. The signal actuates the receiver 27 to energize the relay 28 whereby grounded battery 45 is connected to rotary arm 32 through the operated contacts 44, thence by brush 33 through contact segment 31-T to the grounded relay 35. Energization of said relay attracts the latch 34 to release arm 32 and also operates its contacts 46 to permit a locking circuit to be established by connecting grounded battery 47 through contacts 46 and normally closed contacts 48 to the grounded relay 35. Thus the rotary arm 32 is permitted to rotate until the normally closed contacts 48 are operated.

During the first revolution of rotary arm 32 just before the brush 33 is in a position to engage contact 31-9, perforation 11-b approaches the sensing position for analyzation whereby a signal impulse is transmitted to energize relay 28, whereby the grounded battery 45 is now connected to contact 31-9 to energize the solenoid 43 through conductors 49 and 50 effecting recording of the character 9. Similarly upon analyzation of perforations 11-c and 11-d, respectively, and during the successive rotations of arm 32 solenoids 42 and 41, respectively, are energized successively to record representations 4 and 1 accordingly.

It was mentioned, hereinbefore, that other types of receiving devices could be operated in such systems one form of which is a visually indicating device such as light-bulb instrumentalities and one form of operation of which will now be described.

Briefly, the device includes a plurality of char-

acter receiving and indicating instrumentalities such as indicated by the electric light bulbs 51 and the characters associated therewith and indicated 52 arranged in a preferred order as shown in Figure 2. Associated with each bulb is a controlling relay whereby the energized light bulbs may be maintained in that condition until the entire representation is received so that the entire number, for example, may be viewed as indicated in Fig. 2 and shown to be 941.

The indicating device just described is arranged to be energized successively at the same time the received signals energize the corresponding recording instrumentalities.

Therefore, recalling that the analyzation of perforation 11-a released the distributor arm 32 and that the successive perforations analyzed successively energized the contact segments 31-9, 31-4 and 31-1 during the three revolutions of arm 32, the operation is as follows.

Energization of contact 31-9 by grounded battery 45 and through conductors 49, 50 and 53, normally closed contacts 54, relay 55 and conductor 56, contact 57-1 of stepping relay 58, stepper arm 59 to ground energizes relay 55. The relay contacts 60 are adapted to close before contacts 54 break so that grounded battery is connected through contact 60, relay 55, closed contact 61, conductor 62 and normally closed contacts 63 to ground, thereby maintaining a lock circuit for relay 55, so when rotary arm 32 continues its rotation, the light bulb 51-a representing the character 9 remains energized by the grounded battery through contact 64. The indicating bulb remains energized so long as normally closed contact 63 maintains the locking circuit described.

When the rotary arm 32 engages contact 31-R, the grounded battery 65 energizes the stepper coil due to the ground connection afforded by contact 31-M and its associated brush 67. The stepper coil is automatically energized for each revolution of the arm 32 to step arm 59 forward to the adjacent contact 57.

The stepper relay 58 is but briefly described herein, because the operation thereof is well known to those skilled in the art, however a complete description and disclosure thereof is set forth in the co-pending application Serial No. 737,013, filed July 26, 1934, Patent No. 2,113,611 dated April 8, 1938.

The engagement of brushes 33 and 67 with contacts 31-R and 31-M, respectively, as just described, causes the stepper arm 59 to engage its associated contact 57-2.

Therefore during the second revolution of rotary arm 32 and upon reception of the signal representative of the character 4 (second order) relay 70 is energized to establish a stick circuit similarly as described for relay 55. It is obvious that only the relay 70 corresponding to the character 4 in second bank can be operated due to the position of stepper arm 59. The light bulb 51-b representing 4 remains energized so long as the grounded contacts 63 remain in the normally closed position.

Near the completion of the second revolution arm 32 again engages contacts 31-R and 31-M to step arm 59 to contact 57-3 to permit a representation in the third bank to be energized. Relay 71 during the third revolution of arm 32 when the contact 31-1 is engaged becomes energized due to the operation of relay 28 upon reception of the transmitted signal to become

locked up similarly as relays 70 and 55 and to remain so until contact 63 is operated.

Thus it has been shown how 941 is set up on one form of indicating device and maintained so until completion of the transmission to permit indication of the complete representation.

To restore the device to normal, a stop signal is transmitted, energizing relay 28 when the arm 32 just engages contact 31—S, whereby relay 72 is energized to operate contacts 48, breaking the locking circuit for relay 35, in turn returning the latch 34 to normal position to prevent rotary arm 32 from further rotation, until a start signal is again received, permitting similar control of the receiving devices. The stop signal is initiated by a representative perforation similar to perforations '11—a to d, and it is understood that this signal is transmitted at a suitable timed interval after the indicia signals have been transmitted.

Similarly with the energization of relay 12, coil 73 of the stepper relay 58 is energized to operate contacts 63 thereby breaking all locking circuits to the energized relays 55, 70 and 71 restoring the said relays to normal position. Also, energization of coil 73 restores the stepper arm to its normal position; namely, contact 57—I, placing the circuits in condition, so that upon reception of a start signal the indicating devices are energized in accordance with the transmitted signals and in the correct order. It is well to note that the normally closed contacts 54, 74 and 75a of relays 55, 70 and 71 respectively are operated when the associated relays are energized to prevent additional energization of the corresponding solenoids 43, 42 and 41 of the recording devices due to the grounded battery at contacts 60, 75 and 76a. It is understood that an individual relay device is associated with each light bulb circuit and are indicated as such by the designation 76.

While there has been shown and described and pointed out the fundamental novel features of the invention as applied to a single modification, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention therefore to be limited only as indicated by the scope of the following claims.

What is claimed is as follows:

1. In a signaling system, means comprising a perforated sheet to transmit a plurality of successively timed signals comprising particular representations, said signals comprising single impulses having similar characteristics, means to receive said signals comprising a start-stop rotary distributor including means so as to be operated in timed relationship with said transmitting means, and indicating instrumentalities associated with said distributor to indicate the representations in accordance with the transmitted signals.

2. In a signaling system, signal representation storing means comprising a perforated sheet,

means adapted to analyze said storing means, means to control automatically the analysis of said storing means for a predetermined period, means to transmit the signals analyzed at particular timed intervals said signals comprising single impulses having similar characteristics, means to receive said signals comprising a start-stop rotary distributor including means so as to be operated in timed relationship with said analysis of the storing means, and receiving instrumentalities responsive to the received signals.

3. In a signaling system, means comprising a perforated sheet to transmit a plurality of successively timed signals comprising particular representations, said signals comprising single impulses having similar characteristics, means to receive said signals comprising a start-stop rotary distributor including means so as to be operated in timed relationship with said signal transmitting means, a plurality of orders of receiving instrumentalities responsive to the transmitted signals, and means to maintain said instrumentalities in a responsive condition until complete reception of the representation.

4. In a signaling system, means comprising a perforated sheet to transmit a plurality of successively timed signals comprising particular representations, said signals comprising single impulses having similar characteristics, means to receive said signals comprising a start-stop rotary distributor including means so as to be operated in timed relationship with said signal transmitting means, a plurality of orders of receiving instrumentalities, including means to register the representations corresponding to the signals, responsive to the received signals, and means comprising a stepping relay to control successively the responsive action of the orders of said receiving instrumentalities.

5. The invention set forth in claim 3 wherein means are provided to restore to normal condition the receiving instrumentalities which have been maintained in a responsive condition until complete reception of the said representation.

6. In a signaling system, means comprising a perforated sheet to transmit a plurality of successively timed signals comprising particular representations, said signals comprising single impulses having similar characteristics, means to receive said signals comprising a start-stop rotary distributor, means responsive to one of said signals to start the said distributor, means to operate said distributor a plurality of revolutions in timed relationship with said signal transmitting means, a plurality of orders of receiving instrumentalities including means to register the representations corresponding to the received signals, means comprising a stepping relay to control successively the responsive action of the orders of the said receiving instrumentalities, and means to operate automatically the stepping relay upon each revolution of the said distributor.

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