

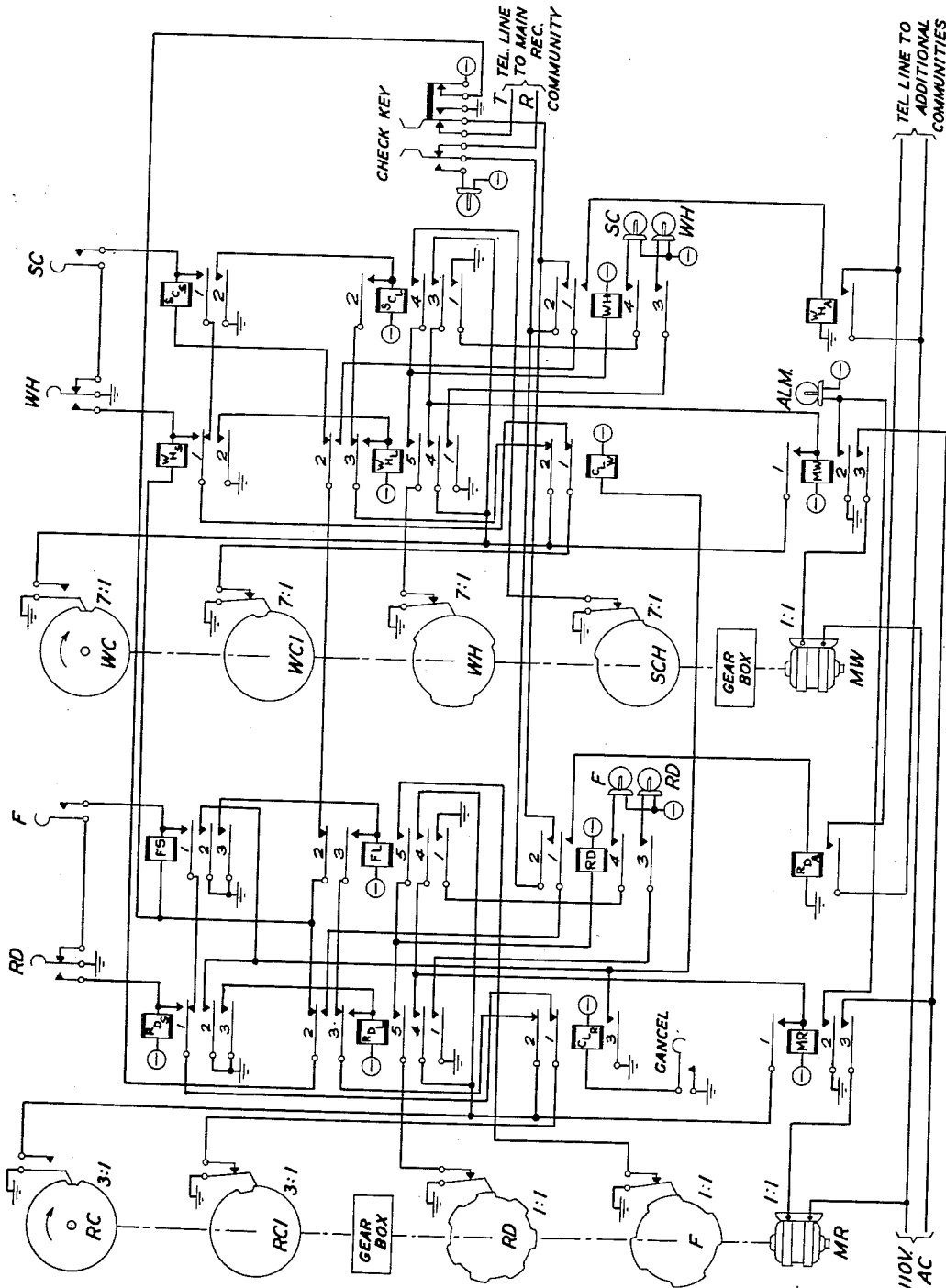
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COMMUNITY ALARM SYSTEM

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COMMUNITY ALARM SYSTEM

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This invention relates to a signaling system and more particularly to a system for disseminating air raid, fire alarm, and no school signals to a community.

An object of this invention is to provide for the reliable transmission of air raid, fire alarm, and no school signals during periods of an emergency.

Another object of the invention is to provide a device that will furnish 24-hour fire alarm and air raid warning service to local, sparsely settled, communities that cannot afford to maintain 24-hour police station service, 24-hour fire station service, or 24-hour air raid observation service.

A feature of the invention is a means wherein a local, sparsely settled community, can make use of the 24-hour police station services available at a larger nearby community for the transmission of air raid alerts, fire alarms, and no school signals.

The accompanying drawing illustrates a complete circuit of a preferred exemplary embodiment of the invention.

The present invention is particularly suitable for use in small sparsely settled communities and villages as it provides a source of 24-hour air raid alert and fire alarm signals for such communities and villages that cannot afford to maintain a 24-hour air raid observer service, 24-hour police service, or 24-hour fire station service. The present invention utilizes the 24-hour police station services available at a nearby larger community as a control center for the transmission of air raid signals, fire alarm signals and signals indicative of no school to the small community desirous of receiving such service. This invention enables an operator located in a larger community that provides 24-hour police service, to send over a single telephone line to a sparsely settled community, four distinct coded signals representing a red air raid alarm, a white air raid alarm, a no school signal, and a fire alarm signal.

The operator that controls this system would receive the signal to commence operation from some external source. The notice to the operator to commence sounding an air raid alarm would probably be received from a special governmental agency by means not disclosed. The notice to the operator to sound a "no school," or "fire alarm" would probably be telephoned in from the small community desirous of receiving such signals. A siren located in the village desirous of receiving the alarm signals, will respond to the coded signals transmitted over the telephone line and emit a tone varying in accordance with the code of the signals transmitted over the line. The system disclosed in the present invention could be made an integral part of, and work in conjunction with, any nation-wide air raid alert and alarm system.

The present invention provides a means of transmitting four distinct and different coded signals over a telephone line to a siren or other suitable apparatus at the receiving end of the telephone line which, in turn, will respond to the coded signals and will repeat these signals in the form of a varying siren tone or other warning indication de-

pending on the type of warning apparatus utilized. A series of cams driven by synchronous motors furnish the timing source for the coded signals. Each cam is cut to a different pattern and each is chosen to represent a desired signal. As shown on the accompanying drawing, cams RD, F, WH and SCH, furnish the timing source for the coded signals representing red alarm, fire alarm, white alarm, and the no school alarm, respectively. The series of cams on the left side of the accompanying drawing are driven by the synchronous motor designated MR, while the series of cams on the right side of the drawing are driven by the synchronous motor designated MW. The cam designated RD, which controls the timing of the red air raid alert, is notched so as to cause a siren to emit a rising and falling wailing sound. The cam designated F, which furnishes the timing means for the fire alarm signal, is notched so as to give equal periods of on and off time for the siren with no resulting rising and falling wailing sound. The cam designated WH furnishes the timing means for the white air raid alarm and is notched so as to furnish a long period of off time followed by a short period of on time to the siren. The SCH cam furnishes the timing means for the no school alarm and is notched so as to provide one short period of on time for the siren during each cycle. It should be noticed that the left-hand cams RD and F, are timed on a one-to-one ratio with the shaft of the motor MR, while the right-hand cams WH and SCH are geared to a seven-to-one ratio with the shaft of the timing motor MW. As a result, the duty cycle of the left-hand cams will be longer than the duty cycle of the right-hand cams. Cams RC, RC1, WC and WC1 are notched and cut to provide a timed holding path for certain control relays by means of the microswitches cooperating with each cam.

The entire system is controlled by means of five keys which are designated RD, F, WH, SC and CANCEL, respectively. The RD, F, WH and SC keys are non-locking and are momentarily operated when it is desired to send red, fire, white or no school signals, respectively. The CANCEL key is provided for the purpose of canceling the sending of any alarm currently in progress.

The operation of the system is initiated by momentarily operating the key representative of the alarm desired to be sent. In the following description it will be assumed that it is desired to send the red air raid alert signals; therefore, the key RD will be momentarily operated. The momentary operation of key RD will close an obvious circuit for the operation of relay RDS which, when operated, will lock by means of its contacts 1, through contacts 1 of relay CLR unoperated, to a ground on the microswitch associated with cam RC1. The cams will move in a clockwise direction as shown in the drawing, and therefore, the microswitch associated with cam RC1 will remain operated until it falls into the notch on the cam. The cams are cut so this will occur immediately after the RC cam has operated to close the locking circuit of the RDL relay. The release of the microswitch associated with the RC1 cam releases the RDS relay but the RDL relay which had operated from relay RDS remains locked to cam RC.

Relay RDS operated, operates relay RDL over its third set of contacts and also operates relay CLW by means of its second set of contacts. Relay CLW operated will halt the sending of any white or no school alarm currently in progress in a manner that will be explained hereinafter.

The operation of relay RDL will interrupt the locking circuit of relay FL and thus halt the operation of any fire alarm that currently may be in progress. Relay RDL operated prepares a holding circuit for itself over its third set of contacts, through the second set of contacts of relay CLR unoperated, to a ground on the microswitch

associated with cam RC. The cams are cut so that the microswitch associated with cam RC will operate soon after the cams have started to rotate and will thereby close the holding circuit for relay RDL. Shortly thereafter the microswitch associated with cam RC1 releases and thereby releases relay RDS by opening its holding path. Relay RDL operated, prepares a circuit to light lamp RD which indicates the red alarm is currently in progress. Lamp RD will not light until both relays RDL and RD are operated.

Relay RDL operated, by its second set of contacts, removes a holding circuit for relays FS, WHS and SCS, if operated, and prepares an operating circuit for relay RDA. The interruption of the operating paths of relays FS, WHS and SCS insures that the fire alarm, white air raid alarm and no school signal could not be initiated during the sending of the red air raid alert signal or, if currently being sent, will be discontinued and replaced by the red air raid alarm.

The operation of relay RDL operates motor relay MR over a circuit which consists of the fourth set of contacts on relay RDL, the second set of contacts on relay CLR unoperated, the third set of contacts on relay RDL operated, to a ground on the third set of contacts on relay RDS operated. The operation of relay MR closes the energizing circuit for the synchronous motor MR which causes the left-hand set of cams to commence a clockwise rotation.

The operation of relay RDL prepares a circuit over its fifth set of contacts for the eventual operation of relay RD.

As soon as relay MR is energized, the synchronous motor MR commences operation and rotates the left-hand cams clockwise. The instant the left-hand set of cams commence its clockwise rotation, cam RC causes the operation of its associated microswitch which in turn provides a locking ground for relays MR and RDL. A short interval of time thereafter cam RC1 allows the microswitch associated therewith to fall into the notch in the cam, thereby releasing both the microswitch and the RDS relay.

The rotation of cam RD causes its associated microswitch to send out a pulsating ground through the fifth set of contacts of relay RDL to the winding of relay RD, thus causing its intermittent operation in accordance with cuttings on cam RD. The intermittent operation of relay RD causes lamp RD to flash and indicate that a red air raid alarm is in progress. Lamp F will not be lit at this time because relay FL remains unoperated during the sending of the red air raid alarm. The intermittent operation of relay RD causes its second set of contacts to intermittently short-circuit the two wires connected to them. These two wires are connected to the telephone line that leads to the receiving community that is desirous of receiving such alarm signals. Appropriate receiving apparatus in the local community desirous of receiving such alarm signals will respond to the short circuit intermittently placed on the line. This receiving apparatus will, in turn, actuate some alarm disseminating device such as a siren or whistle so that the local citizens may be promptly informed of the existence of the condition represented by the signal disseminated.

A test circuit is provided so that the operation of the circuit may be checked without actually operating the siren or other warning device in the receiving community. As the check key is operated, the lamp associated therewith will flash in accordance with cuttings on the cam representative of the alarm currently in progress, thereby providing the operator with a visual indication of the correct functioning of the entire circuit.

The microswitch associated with cam RC releases on the completion of one revolution. The release of this microswitch removes the holding ground from relays MR and RDL thereby causing their release. The release of relays RDL and MR halts the operation of motor MR

and restores the entire circuit to normal. The circuit is now in condition to initiate the sending of any further signals that may be desired.

The operation of this system to initiate a fire alarm follows the same general principles as did the circuit for the red air raid alarm. The operation of the F key will cause the operation of the FS relay which, in turn, will cause the operation of the CLW relay which will cancel the sending of any white alarm or no school alarm currently in progress by opening the holding paths for the relays associated with the circuits controlled by said alarms. The operation of relay FS also causes operation of relay FL which, in turn, locks over the third set of contacts on relay RDL to a ground on cam RC. This ground will not be in effect until the cams have rotated a slight amount. Relay FL operated, closes the circuit for the operation of relay MR which starts the synchronous motor MR in a similar fashion as hereinbefore described.

Relay FL operated, also prepares a circuit so that relay RD will later follow the cuttings on the cam designated F and commence an operation the frequency of which will be determined by the cuttings on cam F. As relay RD commences an intermittent operation in accordance with the cuttings on cam F, it will intermittently short-circuit the telephone line leading to the receiving community and thereby energize the associated alarm apparatus in that community.

Relay RD will also cause lamp F to flash in accordance with the code as determined by cam F. At the end of one revolution of cams RC and RC1, relay FL returns to normal in a manner similar to the corresponding relay associated with the red alarm circuit. The FS relay released as soon as cam RC1 rotated slightly, thereby releasing its associated microswitch. The entire system is again in a position to commence the initiation of the sending of any further signals that may be desired.

If a red alarm key had been operated during the sending of a fire alarm signal, the operation of relay RDL would, with the aid of relay RDS, remove the locking circuit for relays FS and FL, discontinue the sending of a fire alarm, and restore its circuit to normal. Also, the operation of relays RDS and RDL at this time would initiate the sending of a red alarm.

The present invention, by means of circuit connections, effectively ranks the four signals in their order of importance to the community. In the order of their importance, and in order of left to right as shown on the drawing, the four signals are: red alarm, fire alarm, white alert and no school. The no school alarm is considered to have the lowest priority. If any one of the other three alarm keys is momentarily operated while a school alarm is in progress, the sending of the school alarm will immediately be discontinued and the new alarm selected will commence to be emitted. The white alarm is arranged to have the next lowest priority. Thus, if either the red or the fire alarm keys are operated while a white alarm signal is being sent, the white alarm will immediately be discontinued and the new alarm selected will commence to be sent. As might be expected, if while the white alarm is being emitted, the no school alarm key is pressed there will be no resultant change in alarm since the no school alarm has a lower priority than the white alarm. The fire alarm is given the second highest priority. The energization of the red key will cancel any fire alarm that is currently being emitted and substitute therefor the red alarm in its place. The operation of the white or school key while the fire alarm is being emitted would have no effect. The red alarm is considered to have the highest priority and therefore the operation of any one of the other three alarm keys while a red alarm is being sent will have no effect on the circuit. The only way a red alarm can be canceled is by the operation of the cancel key.

The operation of the right set of cams, and the equip-

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ment associated with the white alarm and no school alarm is identical with the operation of the left set of cams and the equipment associated with the red alarm and fire alarm. Since the school alarm and the white alarm operate in a manner similar to that of the red alarm and fire alarm, an itemized and detailed description of this operation is not considered necessary.

On the bottom of the drawing is shown a telephone line which is designated "Telephone Line to Additional Communities." Associated with this line are two relays designated RDA and WHA. The purpose of this equipment is to furnish signals indicative of the red or white alarm to additional communities that do not desire reception of the fire alarm or no school alarm signals. Relay RDA is so connected that it will follow the operations of relay RD only when relay RDL is also operated. Relay RDA will not follow the operations of relay RD if relay FL is operated. Similarly, relay WHA is so connected that it will only respond to the intermittent operations of relay WH when relay WHL is operated. Relay WHS will not respond to the operations of relay WH during the sending of the no school alarm.

The operation of the cancel key will operate relay CLR and in turn relay CLW which together will halt the sending of any alarm currently in progress by opening the holding circuit for the relays associated with said alarm.

It is to be understood that the above-described arrangements are but illustrative of the application of the principles of the invention. Numerous other arrangements may be devised by those skilled in the art without departing from the spirit and scope of the invention.

What is claimed is:

1. In a signaling system adapted to impress a plurality of differently coded electrical signals upon an output circuit such as a communication line, a plurality of selection means, a plurality of switching means each of which is operable by a related one of said selection means, a plurality of timing means each of which is operable by a related one of said switching means, a plurality of signaling means each of which is adapted to be connected by said switching means on a mutually exclusive basis to different ones of said timing means, means operable by each of said switching means when energized to cause its related timing means to operate the signaling means currently associated with said related timing means, means operable in response to the operation of said signaling means to impress upon said output circuit a distinctive coded signal as determined by said timing means.
2. In a signaling system adapted to impress a plurality of differently coded electrical signals upon an output circuit such as a communication line, a plurality of selection means, a plurality of switching means each of which is operable by a related one of said selection means, a plurality of timing means each of which is operable by a related one of said switching means, a plurality of signaling means each of which is adapted to be connected by said switching means on a mutually exclusive basis to different ones of said timing means, means operable by each of said switching means when energized to cause its related timing means to operate the signaling means currently associated with said related timing means, contacts operable in response to the operation of said signaling means to impress upon said output circuit a distinctive coded signal as determined by said timing means, means whereby each of said selection and switching means are connected in a priority circuit so that each selection means of a higher priority may be effective to cancel the operation of the timing means associated with selection means of a lower priority and to initiate the operation of its related timing means and thereby impress its own distinctive coded signal on said output circuit.
3. In a signaling system adapted to impress a plurality of differently coded electrical signals upon an out-

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put circuit such as a communication line, a plurality of selection means, a plurality of switching means each of which is operable by a related one of said selection means, a plurality of timing means each of which is operable by a related one of said switching means, a plurality of signaling means each of which is adapted to be connected by said switching means to different ones of said timing means, means operable by each of said switching means when energized to cause its related timing means to operate the signaling means currently associated with said related timing means, contacts operable in response to the operation of said signaling means to impress upon said output circuit a distinctive coded signal as determined by said timing means, means whereby all of said selection and switching means are connected in a circuit that determines the relative priority of each coded signal and its related timing and switching means so that the operation of each selection means of a higher priority may be effective to cancel the operation of the timing means associated with selection and switching means of a lower priority and to initiate the operation of its related timing means and thereby impress its own distinctive coded signal on said output circuit, and means to cancel the operation of any signaling means and to halt the sending of any coded signal over said output circuit.

4. In a signaling system adapted to impress a plurality of differently coded electrical signals upon a first and a second output circuit, a plurality of selection means, a plurality of switching means each of which is operable by a related one of said selection means, a plurality of timing means each of which is operable by a related one of said switching means, a plurality of signaling means each of which is adapted to be connected by said switching means to different ones of said timing means, means operable by each of said switching means when energized to cause its related timing means to operate the signaling means currently connected to said related timing means, contacts operable in response to the operation of said signaling means to impress upon said first output circuit a distinctive coded signal as determined by said timing means, means whereby all of said selection and switching means are connected in a circuit that determines the relative priority of each coded signal and its related timing and switching means so that the operation of each selection means of a higher priority may be effective to cancel the operation of the timing means associated with selection and switching means of a lower priority and to initiate the operation of its related timing means and thereby impress its own distinctive coded signal on said first output circuit, additional switching means whereby only certain ones of said timing means may cause their own distinctive coded signals to be impressed upon said second output circuit, and means to cancel the operation of all signaling and timing means and to halt the sending of any coded signal over said output circuits.

5. In a signaling system adapted to impress a plurality of differently coded electrical signals upon an output circuit such as a communication line, a plurality of selection switches, a plurality of switching relays each of which is operable by a related one of said selection switches, a plurality of notched timing cams each of whose operation is initiated by the operation of a related one of said switching relays, a pair of contacts operably associated with each cam, a plurality of signaling relays each of which is adapted to be electrically connected by said switching relays on a mutually exclusive basis to different ones of said timing cam contacts, means including relay contacts operable by each of said switching relays when energized whereby the cam contacts associated with the timing cam related to said energized switching relay is caused to operate the signaling relay currently associated with said related timing cam, impressers of electrical variations operable whereby the operation of said signal-

ing relay impresses upon said output circuit a distinctive coded signal as determined by said timing cam.

6. In a signaling system adapted to impress a plurality of differently coded electrical signals upon a first and a second output circuit, four selection switches, four switching relays each of which is operable by a related one of said selection switches, four peripherally notched timing cams each of whose operation is initiated by the operation of a related one of said switching relays, a pair of contacts associated with each cam and operable by the peripheral notches thereon, two signaling relays each of which is adapted to be connected electrically by said switching relays to different ones of said timing cams, means including relay contacts operable by each of said switching relays when energized whereby the timing cam related to said energized switching relay is caused to operate the signaling relay currently associated with said related timing cam contacts, impressors of electrical variations operable whereby the operation of said signaling relay impresses upon said first output circuit a distinctive coded signal as determined by the peripheral notches in said timing cam, means whereby all of said selection switches and switching relays are connected in a circuit that determines the relative priority of each coded signal and its related timing cam and switching relay so that the operation of any selection switch of a higher priority may be effective to cancel the operation of the timing cams associated with selection switches and switching relays of a lower priority and to initiate the operation of its related timing cam and thereby impress its own distinctive coded signal on said first output circuit, two additional signaling relays whereby only certain predesignated ones of said timing cams may impress their own distinctive coded signals upon said second output circuit, additional switching means to cancel the operation of all signaling relays and to halt the sending of any coded signal over said output circuits.

7. In a signaling system, a plurality of timing means, a

plurality of signaling means each of which is associated on a mutually exclusive basis to different ones of said timing means; a plurality of selection means with each being functionally related to an individual one of said timing means, a plurality of switching means each operable by a related one of said selection means, means operable by said switching means to cause a related one of said timing means to operate the signaling means currently associated with the individual said timing means, and means whereby all but one of said selection means may be effective to cancel the operation of signaling means associated with some of the other selection means and to initiate the operation of its related signaling means.

8. In a signaling system, a plurality of timing means, a plurality of signaling means each of which is associated on a mutually exclusive basis to different ones of said timing means, a plurality of selection means with each being functionally related to an individual one of said timing means, a plurality of switching means each operable by a related one of said selection means, means operable by said switching means to cause a related one of said timing means to operate the signaling means currently associated with the individual said timing means, means whereby all but one of said selection means may be effective to cancel the operation of signaling means associated with some of the other selection means and to initiate the operation of its related signaling means, and means effective to cancel the operation of all signaling means.

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