

Feb. 9, 1971

P. A. NELSON

3,562,736

CODE RESPONSIVE MONITORING SYSTEM

Filed Oct. 22, 1965

2 Sheets-Sheet 1

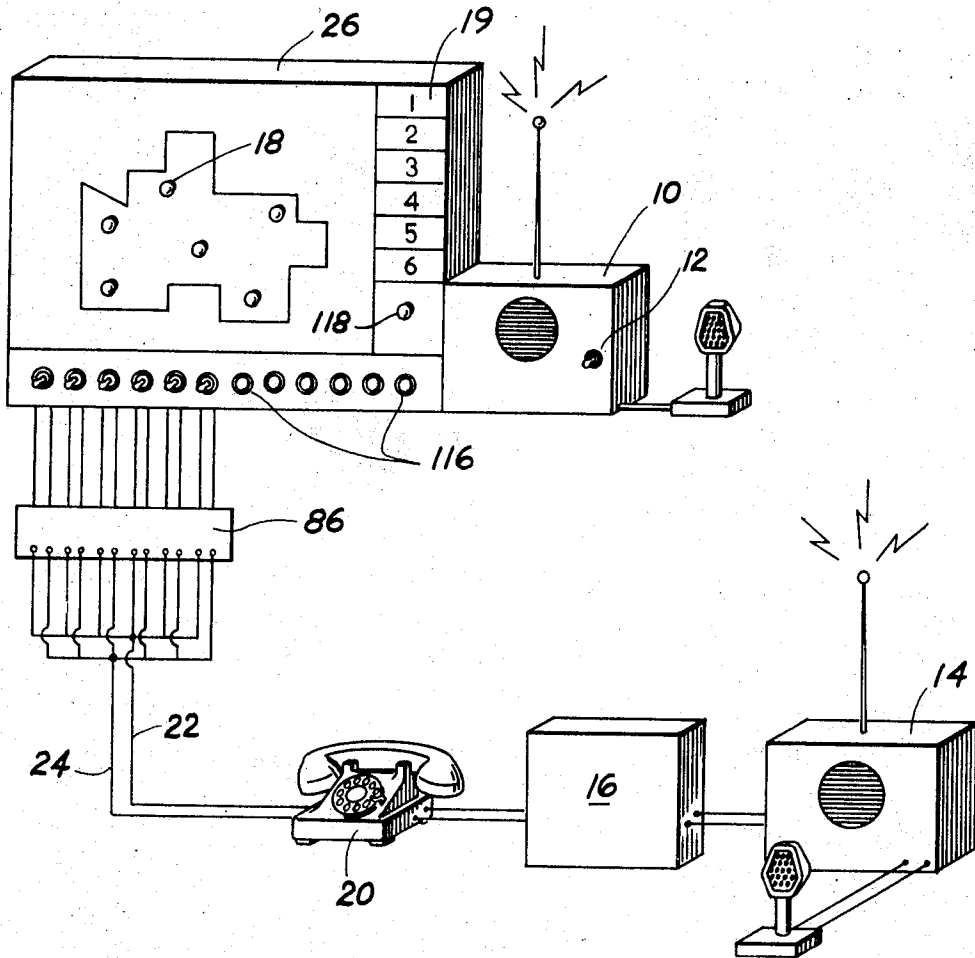


Fig. 1

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2 Sheets-Sheet 2

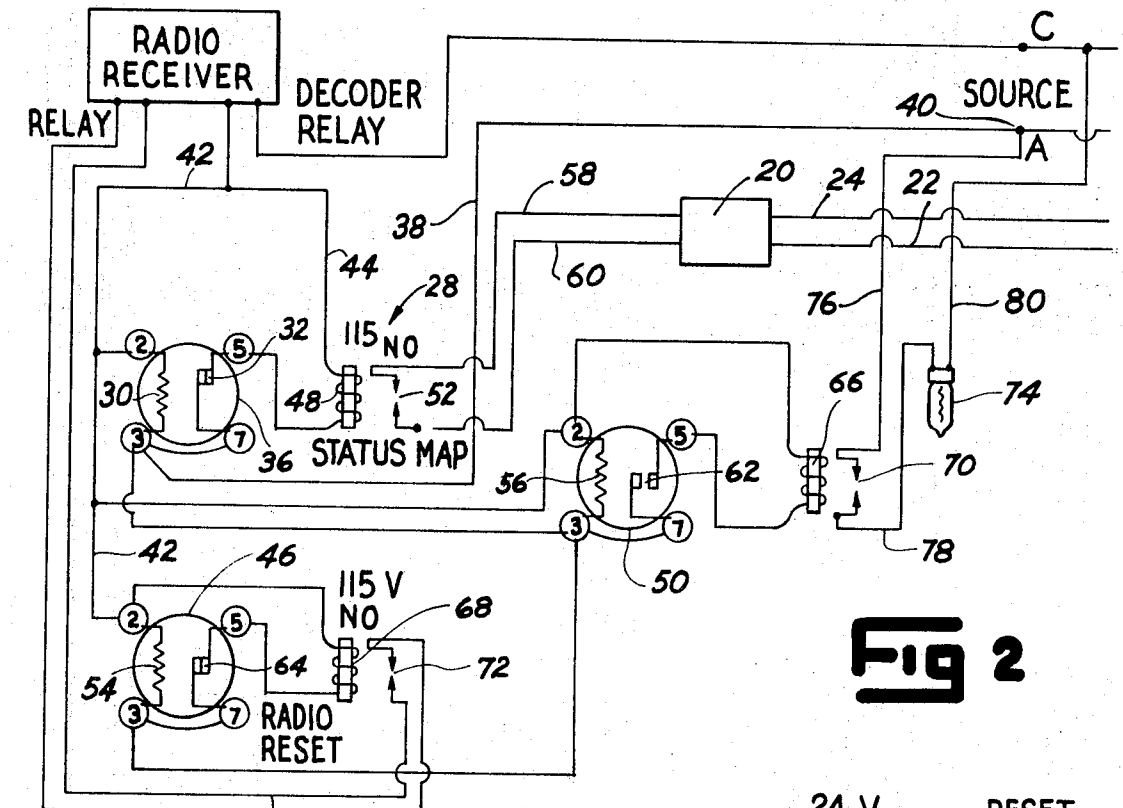


Fig 2

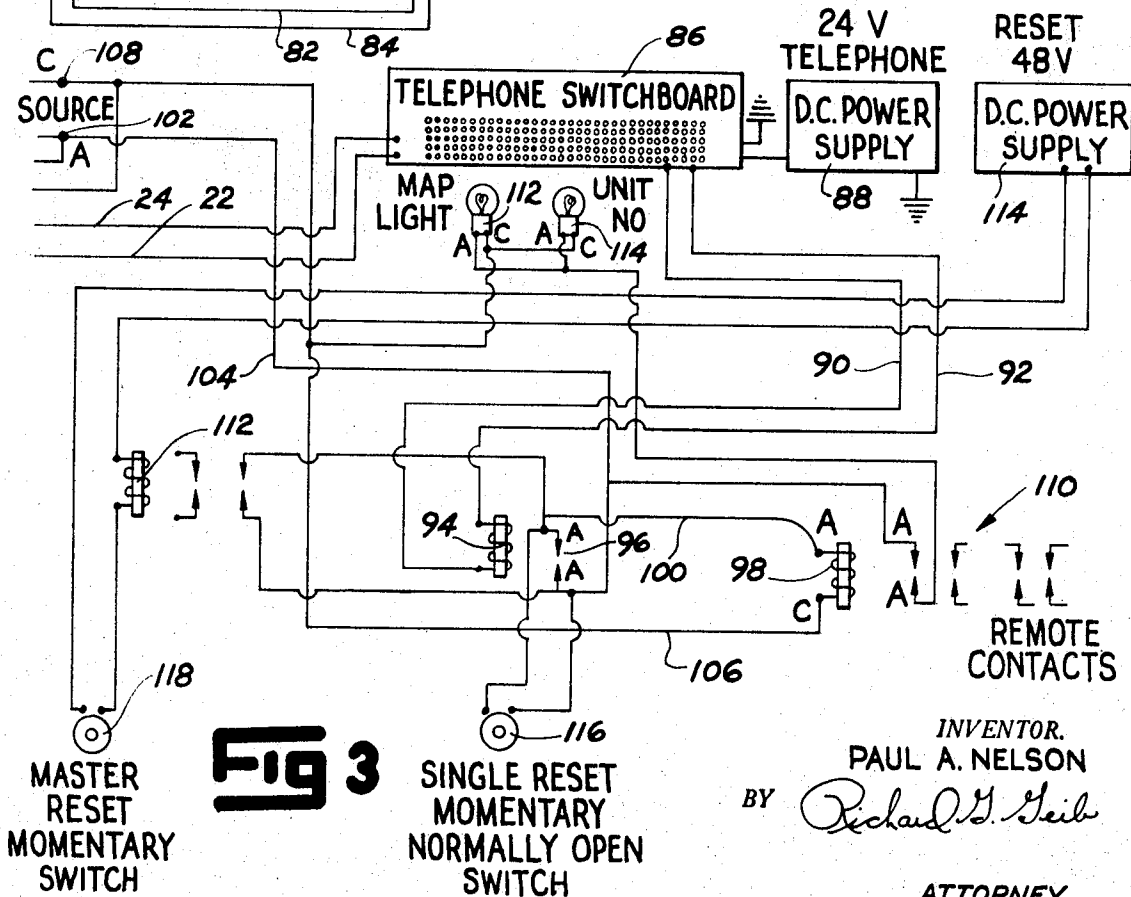


Fig 3

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1

2

3,562,736

CODE RESPONSIVE MONITORING SYSTEM

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U.S. Cl. 340—313

6 Claims

ABSTRACT OF THE DISCLOSURE

In a radio alerting system an impulse signal generating means activated by energization of the system to energize relay means that in turn operates indicating means to inform an alarm station operator that the alert signal has been received by a remote station.

This invention is concerned with means to indicate to the operator of an alarm system that an alarm signal has been sent to and received by remote locations.

It is a principal object of my invention to provide a means to send an impulse signal from a remote station which has been alerted by a radio transmission to show receipt of the radio transmission to an alarm station that has initiated the broadcast alarm.

With the advent of the everclosing distance between populace areas it has become increasingly apparent that the police and fire radio frequencies are overlapping from city to city. Thus policemen and firemen have been alerted by alarm signals from neighboring localities.

This has lead many manufacturers to supply radio alert systems which are normally quiet until activated by an alarm station operator in a remote location.

However, this too has a disadvantage in that the operator is not aware of the receipt of his alert signal until precious minutes have passed which delays his ability to substitute other equipment.

Furthermore, the present state of the art is such as to require the alarm operator to manually, after minutes have gone by and radio communication is established between a separate radio system and the alarm station, operate a status map indicator to show that the remote station is alerted and responding. The elimination of these precious minutes of waiting is yet another object of my invention.

Still another object of my invention is to provide an automatic reset of the alarm system of the remote station that may also be manually actuated to reactivate the alarm system for future use.

I have been talking principally in the area of fire department alerting systems. However, I readily visualize my system can be used to alert other types of public and private service means such as police department vehicles that are cruising, ready room pilots of our nation's defense system, cruising taxicabs, and remote newspaper offices or roving reporters. In short the versatility of my invention is not to be limited by the description of the embodiment I have thus far reduced to practice in the South Bend Fire Department. It is without a doubt that the range of importance of my invention can be expanded further as will be understood by those skilled in the art to which my invention is directed.

Other objects and advantages will readily be obvious to those skilled in the art from the following detailed description taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a schematic presentation of a fire alarm system embodying the principles of my invention;

FIG. 2 is a block diagram of the radio actuated electrical circuitry at a remote location in accordance with the principles of my invention; and

FIG. 3 is a block diagram of the electrical circuitry in the alarm station actuating a status map.

With reference now to FIG. 1, there is shown a radio alarm system including a radio transmitter 10 actuated by a switch 12 to transmit a predetermined pulse modulated radio signal. This signal is received by a remotely located receiver 14 which directs the signal internally to a tone selective system. If the transmitted pulse coded signal is of the right order, it will actuate, through a decoder, a relay means and a reset mechanism within the box 16. This will create an impulse signal which in the present embodiment will through telephone 20 and phone lines 22 and 24 energize lights behind areas 18 and 19 in a status map 26 located in the central alarm station.

Before the system above described, the person in charge of the remote station upon being alerted by the stations receiver 14, had to actuate a circuit closer to energize visual signals in the central station in order to permit the alarm station operator to schedule other companies to cover in the absence of the company alerted. This resulted in precious seconds of delay to the alarm station and required continuous vigilance at the remote station increasing the strain on the personnel. On return of the alerted company he would have to open the circuit closer. My invention, in addition to the other objects above, does away with all these manual steps.

A more detailed explanation of the radio alarm system portion may be observed in the Motorola, Inc., Pat. No. 3,149,317 issued Sept. 15, 1964. Therefore, I will not dwell on it further in my specification.

Essentially my invention resides in the coupling of an impulse signal generating means with a radio alarm system to actuate an indicator system. It is more particularly described with reference to FIGS. 2 and 3.

The box 16 comprises a thermostatic delay relay 28 including an electronic tube 36 having a heater coil 30 controlling a normally closed switch 32. One side of a heater coil 30 and a switch 32 is connected through terminals 3 and 7 of tube 36 to a lead 38 from a terminal 40 of an AC power source. The other end of coil 30 is connected by a lead 42 to a decoder actuated switch (not shown) in the radio receiver 14. Another lead 44 is also connected to a decoder relay actuated switch and the other end of switch 34. Thus when the decoder switch is closed the circuit is completed to a relay coil 48 to operate a normally open switch 52.

Simultaneously upon closing of the decoder switch tubes 46 and 50 have their respective heater coils 54 and 56 energized. Tube 50 also includes a normally open switch 62, and tube 46 includes a normally closed switch 64. Switches 62 and 64 control relays 66 and 68 that in turn comprise normally open switches 70 and 72.

Thus, when the decoder relay actuated switch in receiver 14 is closed, as aforementioned, tubes 36, 50 and 46 have the heater coils activated. Also the circuits to relays 48 and 68 will be closed to close switches 52 and 72. This then completes the circuit to leads 58 and 60 and to leads 82 and 84.

After a limited period of time the thermostatic elements of switch 62 will be closed by the heat of coil 56 to activate relay 66 and close switch 70. This closes the circuit provided by leads 76, 78 and 80 to light 74 in the remote station house.

Later the switches 32 and 64, which have thermostatic elements that take a greater amount of heat to separate the contacts thereof than that required to close the contacts of switch 62, open to deactivate relays 48 and 68. This opens the circuit to telephone 20 and a holding coil in the decoder relay switch in receiver 14. Thus the receiver and indication system are reset for future actua-

tion by the transmitter 10 automatically, and turn off light 74.

As soon as the telephone circuit is closed by switch 52, the telephone lines 22 and 24, through a telephone switchboard 86 (see FIGS. 1 and 3), connect a DC power supply 88 through leads 90 and 92 to a relay 94 closing a normally open AC switch 96 whose poles are connected, respectively to a relay 98 by lead 100 and an AC terminal 102 by lead 104. The relay by means of a lead 106 is also connected to the other terminal 108 of the AC power supply.

Relay 98 then actuates a plurality of switches 110 that close circuits to lights 112 and 114 respectively behind areas 18 and 19 of map 26. The number of relays 94 and 98 and switches 110 depend solely on the number of areas desired for the map 26, as may readily be appreciated by those skilled in the art.

A holding relay 112 is continuously connected to a DC power source 114, as seen in FIG. 3. One of these is provided for each relay 94 and it is controlled by both a single reset switch 116 and a master reset switch 118 so that the status map may be cleared by the alarm station operator.

Having set forth a form which my invention may take, I now will set forth the scope of coverage I seek by the appended claims.

I claim:

1. An alarm system activating and indicating means comprising:

- a monitor radio;
- a radio responsive relay means;
- a timer means activated by said radio responsive relay means;
- a holding relay means operatively connected to said relay means and to said timer means;
- a delay relay means operatively actuated by said holding relay means including a D.C. power supply and an A.C. impulse receiver;
- a D.C. latching relay operatively connected to said delay relay means; and
- an A.C. ratchet type relay operatively connected to said latching relay and activated by said latching relay; and
- an indicator system operatively connected to said A.C. ratchet type relay.

2. An alarm system activating and indicating means according to claim 1 wherein said indicator system includes a map of an area served thereby and a plurality of indicators each of which is operated by an individual ratchet type relay.

3. An alarm system according to claim 1 wherein said timer means includes a heat responsive switch means to sequentially alert a remote station and reset said radio responsive relay means automatically.

4. An alarm system according to claim 2 and further comprising a master reset means and an individual reset means to manually clear said indicator system.

5. For use in an alarm system a means to indicate receipt of an alert signal by a device remote from a sender thereof, which means comprises:

- a radio signal transmitting means;
- a radio signal receiving means;
- a relay means operatively connected to said radio signal means;
- a holding means operatively connected to said relay means and activated by said radio signal transmitting means;
- a signal sensing and conversion means receiving an A.C. impulse from said relay means and converting said signal to a D.C. impulse; and
- an indicator operatively connected to said signal sensing means and responsive to the D.C. impulse from said signal sensing and conversion means.

6. A means to indicate receipt of an alert signal according to claim 5 and further comprising an indicating relay means including a ratchet type relay which will hold said indicating relay means until deactivated.

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HAROLD I. PITTS, Primary Examiner

U.S. Cl. X.R.

340—311, 312, 225, 171, 164; 179—2

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,562,736 Dated February 9, 1971

Inventor(s) PAUL A. NELSON

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:
Column 3, lines 28 through 45, for Claim 1 read --

1. An alarm system activating and indicating means comprising: a radio receiver; decoder relay means for actuating said receiver upon a predetermined radio signal being received thereby; timer means connected to said decoder relay means to be activated thereby; first relay means connected to said decoder relay means and to said timer means to be actuated by the former and deenergized by the latter after a predetermined time; second relay means connected to said timer means to be actuated simultaneously with said first relay means, said second relay means including first switch means for opening and closing a D. C. power supply circuit and an A. C. impulse receiver for operating said switch; D. C. latching relay means connected in said circuit from said first switch means of said second relay means and actuated upon closure of same to close a second switch means of an A. C. power supply circuit remote from that connected to said A. C. impulse receiver and said timer means; A. C. ratchet type relay means connected to said second switch means of said latching relay means and activated by closure of said second switch by said latching relay means to close a third switch means in said A. C. circuit; and an indicator system connected to said third switch means of said A. C. ratchet type relay means to indicate that the radio receiver has been activated.

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,562,736 Dated February 9, 1971

Inventor(s) PAUL A. NELSON PAGE - 2

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 4, lines 13 through 28, for claim 5 read --

5. For use in an alarm system a means to indicate receipt of an alert signal by a device remote from a sender thereof, which means comprises: a radio signal transmitting means; a radio signal receiving means; a decoder relay means connected to said radio signal receiving means, said decoder relay means activating an electrical circuit upon receiving a predetermined signal from said transmitting means; a holding means including timer means and relay means in series circuit therewith to be controlled thereby upon actuation of said electrical circuit connecting said holding means to said decoder relay means activated by said radio signal transmitting means with a portion of said relay means of said holding means receiving an A. C. impulse for its relay coil when said decoder relay means is actuated to close a switch in a line connection to a station where said radio transmitting means is located thereby providing a D. C. impulse thereto; and an indicator means connected to said line connection and responsive to the D. C. impulse to register that said radio signal receiving means has been activated.

Column 4, lines 40 through 43 to read --

2,535,162	Rodgers_____	340- 312
3,113,270	Bassett_____	340 - 311X
3,233,232	Brennon_____	340 - 313X
3,327,217	Stang et al _____	340 - 311X

Signed and sealed this 22nd day of June 1971.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents