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CROSS REFERENCE

BURGLAR ALARM AND MONITORING SYSTEM

Filed July 3, 1962

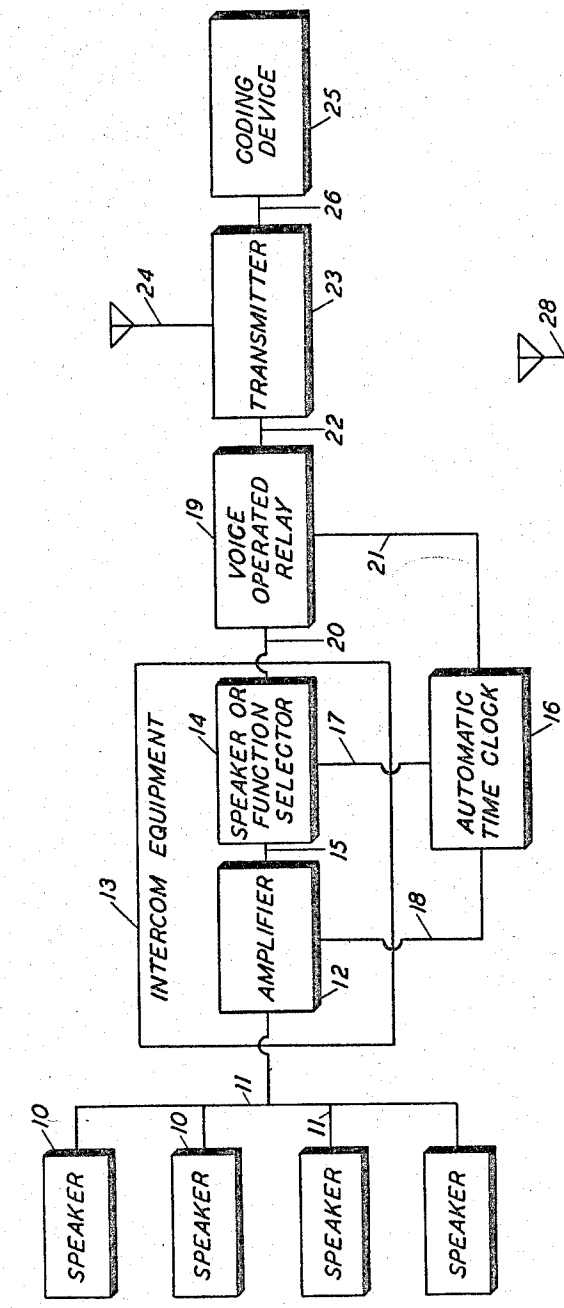


FIG. 1

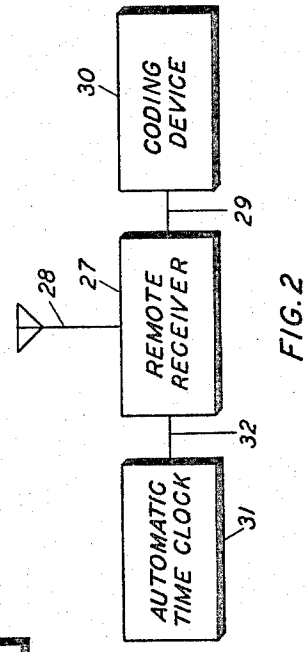


FIG. 2

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United States Patent Office 3,156,909 Patented Nov. 10, 1964

3,156,909

BURGLAR ALARM AND MONITORING SYSTEM

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Filed July 3, 1962, Ser. No. 207,312
3 Claims. (Cl. 340—261)

This invention relates to a burglar alarm and monitoring system and more particularly to a system for transmitting an alarm by radio.

The principal object of the invention is the provision of a burglar alarm and monitoring system that may be installed in a building having a multiplicity of rooms or room-like areas and arranged so that any sound occurring in the rooms or room-like areas is electrically detected, amplified and used to control a radio transmitter so as to broadcast said actuating sound on a predetermined wave length so that it may be received by a tuned receiver and comprise a remote alarm.

A further object of the invention is the provision of a burglar alarm and monitoring system that incorporates an intercommunication system in a building as part of its detecting and actuating means.

A still further object of the invention is the provision of a burglar alarm and monitoring system that is arranged to monitor a given area or areas at a predetermined time and utilize any sounds occurring in the monitored areas to actuate a transmitter to broadcast said sounds as an alarm.

A still further object of the invention is the provision of a burglar alarm and monitoring system that will detect and convert voice and other sound energy to electrical energy and which energy is used to control a radio transmitter.

The burglar alarm and monitoring system disclosed herein comprises an improvement in such systems in that the system is not apparent upon casual or careful inspection of the premises as it utilizes conventional intercommunication apparatus normally found in various buildings, rooms, warehouses and the like. The system is arranged to use the intercommunication system to pick up any sound occurring in the supervised area during predetermined periods of time, such as at night, and to use these sounds to operate the appropriate portions of a radio broadcasting transmitter so as to broadcast the sounds whereupon they may be received in a remote location and advise the listener of an abnormal situation requiring invention. The system in no way interferes with the usual use and operation of the intercommunication system of which it is a part.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being the intention to cover all changes and modifications of the example of the invention herein chosen for purposes of the disclosure, which do not constitute departures from the spirit and scope of the invention.

The invention is illustrated in the accompanying drawing, wherein:

FIGURE 1 illustrates in block diagram form the detecting and transmitting portion of an embodiment of the invention.

FIGURE 2 illustrates in block diagram form a receiving portion of an embodiment of the invention.

By referring to FIGURE 1 of the drawings, it will be seen that a plurality of intercommunication speaker-microphone units **10**, **10** are illustrated in block form and coupled by suitable conductors **11**, **11** to an amplifier **12** comprising part of a conventional central office

intercommunication system control unit **13**. The central intercommunication system control unit **13** includes a speaker or function selector section **14** coupled by suitable conductors **15** with the amplifier **12** thereof as will be understood by those skilled in the art. The speaker or function selector **14** device acts to permit the intercommunication unit **13** to receive signals from the speakers **10**, **10** or to transmit signals thereto as in the case of the usual intercommunication equipment.

As utilized in the present invention, the speaker or function selector **14** is controlled either manually or automatically as by an automatic time clock **16** coupled thereto by conductors **17** in the illustrated embodiment so that the speakers **10**, **10** act as microphones for the detection of sounds in the several areas in which the same are located with the input signals therefrom delivered to the amplifier **12**. In the illustrated embodiment, the automatic time clock **16** also controls the amplifier **12** so that the complete burglar alarm and monitoring system is automatic in operation and will go into operation at a predetermined time regardless of its manual setting from its immediate previous use. The automatic time clock is coupled by suitable conductors **18** to the amplifier **12** for this purpose and the automatic time clock **16**, the amplifier **12**, and speaker or function selector **14** are in connection with a suitable power source (not shown).

The system includes a voice operated relay device **19** coupled by suitable conductors **20** with the speaker or function selector **14** and by suitable conductors **21** with the automatic time clock **16**. The voice operated relay device **19** is coupled by suitable conductors **22** to a radio transmitter **23** which in turn is connected with a power source (not shown) and arranged so that it is in operation with respect to its radio frequency circuits and subject to immediate actuation of its audio frequency circuits as controlled by the voice operated relay **19**. A transmitting antenna **24** is electrically connected to the transmitter **23** and those skilled in the art will observe that if desired a coding device **25** may be coupled by conductors **26** to the audio frequency circuits of the transmitter **23** so that a coded audio signal is broadcast rather than the actual sounds picked up by the speakers **10** heretofore referred to.

It will thus be observed that the detection, controlling circuit and transmitting portions of the burglar alarm and monitoring system comprise the several devices illustrated in the block diagram of FIGURE 1 and that in operation, for example, in a school building having a number of rooms and a conventional intercommunication system installed therein the speakers **10**, **10** will be located one in each of the rooms or buildings and the central intercommunication control unit **13** will be located in a central location such as an office. In the case of a school system as used in the illustration herein given, the intercommunication control unit **13** and the speakers **10**, **10** operate in their usual conventional manner during school hours so that one or more or all of the speaker units **10**, **10** may be supplied with desirable programming from the central unit **13**, or alternately, any one of them may be used with the central control unit **13** as a two-way intercommunication system, all as well known in the art. At the close of school hours, the system may be manually de-energized as is customary. At a desired time thereafter, the automatic time clock **16** will re-energize the intercommunication system as hereinbefore described and set the speaker or function selector **14** thereof so that the speakers **10**, **10** act as sound detecting units, feeding their sound responsive electronic signals back to the amplifier **12** of the intercommunication unit **13**. Simultaneously, the

voice operated relay device **19** is energized and placed in communictaion with the function selector **14** and a circuit established therethrough to the amplifier **12**. Thus, a noise, such as the breaking of glass, the slamming of a door, or of persons talking to one another, will be picked up by the speaker or speakers **10, 10** the signal delivered to the amplifier **12** and function selector **14** and from the amplifier **12** and function selector **14** to the voice operated relay device **19**. Simultaneously, with the automatic energization of the intercommunication unit **18** the automatic time clock **16** will energize the radio transmitter **23** so that the same is in standby condition ready to transmit a radio frequency signal. The signal delivered to the voice operated relay device **19** as hereinbefore described operates the same to instantly establish electrical connection with the radio frequency circuits of the radio transmitter **23** whereupon such signals are broadcast either in the form picked up by the speakers **10, 10** if desired in coded form having been bypassed through the coding device **25** before being delivered to the radio frequency portion of the radio transmitter **23**. Upon the termination of the sounds actuating the voice operated relay **19**, the same will drop out and the radio frequency portion of the radio transmitter **23** disconnects. Thus, there is no continuing audio frequency transmission which could be detected by someone attempting to monitor the same, or will the wave length employed be monopolized.

By referring to FIGURE 2 of the drawings, a block diagram illustration of a conventional radio receiver **27** may be seen coupled to a receiving antenna **28** preferably matching the wave length of the transmitting antenna **24** and if necessary of a directional nature preferably oriented relative thereto. The radio receiver **27** may be and preferably is coupled by conductors **29** with a decoding device **30** which will automatically receive and decode the signals transmitted by the coding device **25**, and transmitter **23**. The coding and decoding devices **25** and **30** may obviously comprise voice scramblers as known in the art or they may alternately comprise devices converting sound waves in the audible cycle range to pulse codes.

The radio receiver **27** may be coupled to an automatic time clock **31** by electrical conductors **32** and which automatic time clock **31** may be synchronized with the automatic time clock **16** heretofore referred to. The receiver **27** may obviously be located at a considerable distance from the location of the detecting, controlling and transmitting signal system illustrated in FIGURE 1 and heretofore described.

In the case of the school building example hereinbefore referred to the receiver **27** may be located in the custodian's home or in the office of the city, county, or State police serving the area in which the school is located.

It will thus be seen that a burglar breaking into a building equipped with the burglar alarm and monitoring system disclosed herein and making some slight sound, or talking to a co-conspirator, will automatically actuate the system without his being aware of the existence of the same, inasmuch as the regular and usually applied tests for a burglar alarm system will fail to disclose the present system. In actual installations now operating, each breaking and entering of the supervised buildings has resulted in an immediate and satisfactory alarm enabling the appropriate police officers to apprehend the persons breaking into the buildings while they were still in the buildings and completely unaware of the fact that their sounds, voices, and actions had been relayed by the system as a burglar alarm and having thus described my invention, what I claim is:

1. In a combination intercommunication, burglar alarm and monitoring system, apparatus comprising means operable to generate and transmit an alarm signal, and remote means operable to receive said alarm signal, said means operable to generate and transmit an alarm signal comprising a plurality of speaker-microphones, an amplifier coupled to said speaker-microphones, a function selector coupled to said amplifier, said function selector acting to receive signals from said speaker-microphones and transmit signals to said speaker-microphones, a voice operated relay coupled to said function selector, and a radio transmitter coupled to said function selector by way of said voice operated relay, said transmitter responsive in operation to said voice operated relay, said remote means operable to receive said alarm signal comprising a radio receiver tuned to the frequency of said transmitter.

2. The burglar alarm and monitoring system set forth in claim 1 and wherein said apparatus includes a coding device coupled to said transmitter and acting to transform signals delivered to said transmitter prior to the transmission thereof.

3. In a burglar alarm and monitoring system a central office unit, a plurality of locations remote from said central office unit, conductors connecting the central office unit and the locations, sound transducers in said locations, an amplifier and a speaker and function selector device in said central office unit, said speaker and function selector device acting to receive signals from said sound transducers and transmitting said same signals to said sound transducers, a radio transmitter in said central office unit, said sound transducers normally in energized relation with said amplifier and speaker and function selector, a voice operated relay device in said central office unit and interposed between said amplifier, speaker and function selector and said transmitter and arranged to actuate said transmitter from the detection of sounds by said sound transducers and means connecting said amplifier, speaker and function selector and transmitter to a power source.

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