[72] Inventors J[illegible]
K[illegible]
S[illegible]
C[illegible]
W[illegible]

[21] Appl. No. 733,693
[22] Filed May 31, 1968
[45] Patented Apr. 6, 1971
[32] Priority May 31, 1967
[33] Great Britain
[31] 25199/67

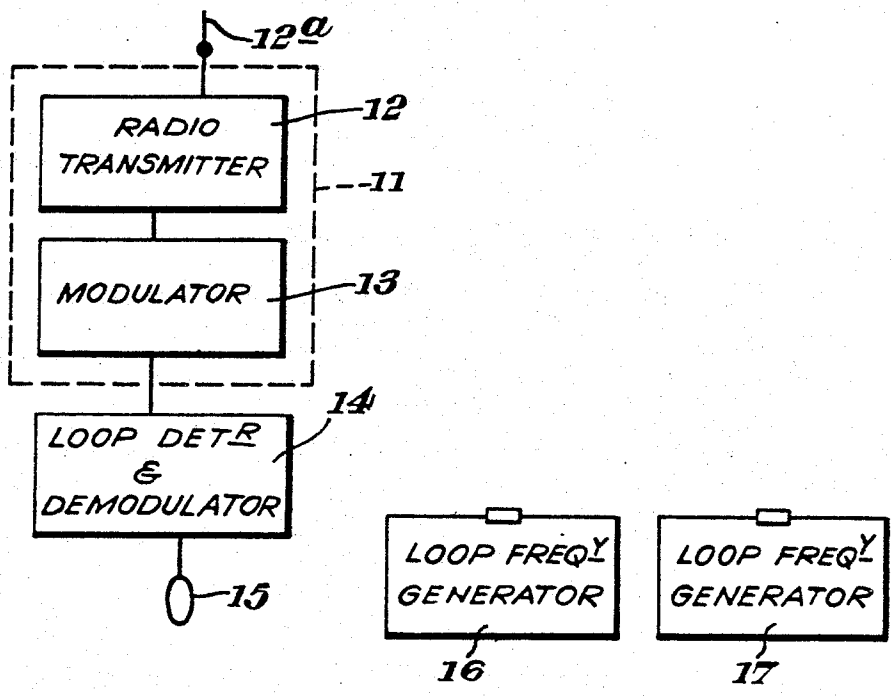
[54] **SECURITY SYSTEM WITH INDUCTIVE TO RF COMMUNICATIONS LINKS**
3 Claims, 3 Drawing Figs.

[52] U.S. Cl. 325/53, 325/64, 325/113, 340/224, 340/306
[51] Int. Cl. H04b 1/50, G08b 25/00
[50] Field of Search ..... 325/4, 7, 16, 51, 53, 64, 111, 113, 118; 340/224, 306, 152 (TR), 286, 287, 311, 312; 343/226

References Cited
UNITED STATES PATENTS
[illegible]lker et al. 325/51
[illegible]ard 340/312
3,478,344 11/1969 Schwitzgebel et al. 325/64

Primary Examiner—Robert L. Griffin
Assistant Examiner—James A. Brodsky
Attorneys—Harry C. Bierman, Jordan B. Bierman and Bierman and Bierman

ABSTRACT: In a location system a radio transmitter carried by a security guard or watchman includes a loop aerial and a loop demodulator, and loop carrier frequency generators each generating a loop carrier frequency modulated by a different modulating frequency are installed at different points to be visited by the guard, so that as the guard reaches each point the loop carrier is demodulated and the modulating frequency is used to modulate the transmitter carrier. The transmitted signals are picked up at a distant monitoring point, demodulated, and the modulating frequency is identified with the point visited.



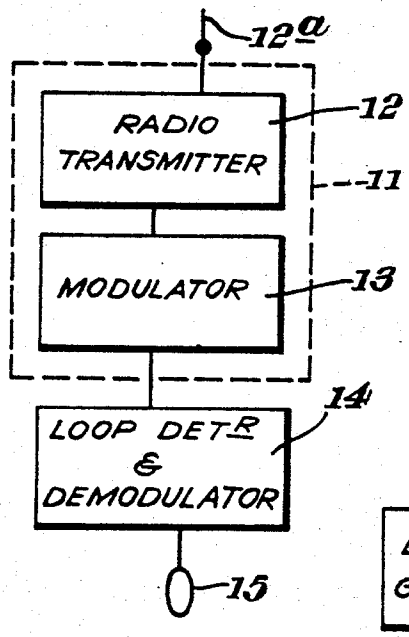
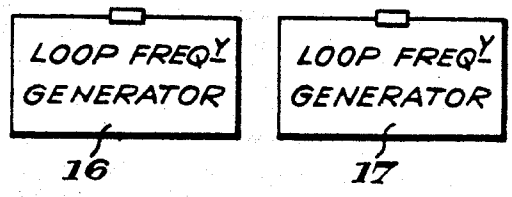


Fig. 1.



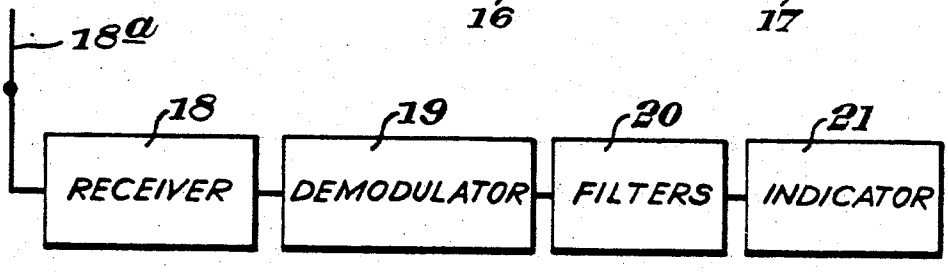
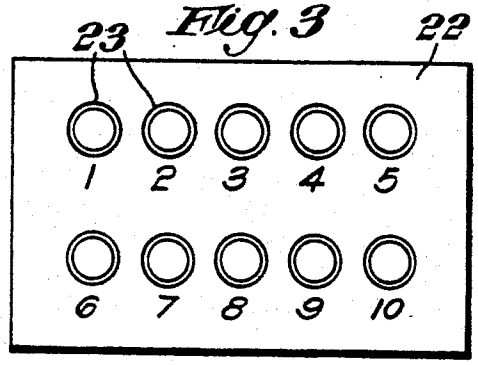


Fig. 2.

Fig. 3



JOHN RAYMOND ASHLEY
COLIN GRAHAME DOUGLAS
INVENTORS

By Bierman & Bierman
ATTORNEYS

SECURITY SYSTEM WITH INDUCTIVE TO RF COMMUNICATIONS LINKS

This invention relates in general to security systems, and more particularly to a system by which the movements of a watchman or security guard may be automatically indicated at a remote point on a monitoring system which may, for example, be located at the headquarters of a Security Service or in a Police Station.

In order to protect property and maintain continual watch for the development of fires, it is quite usual to employ a night watchman or security guard whose duty it is to patrol the property or premises in question. To ensure that this officer carries out his duties correctly it is common practice to provide a number of check points all of which the officer is required to visit at predetermined intervals. In one system the officer is provided with a clock device into which he can insert any one of several keys mounted at discrete locations in the premises in order to record each visit to each location on a paper tape within the clock device. However, it is possible for an officer to be attacked by unauthorized persons lurking on the premises and in such a case the fact that after being attacked the officer has not visited any of the check points would not be known until the following morning and the information would then be useless. If the officer should be attacked he will, of course, desire to summon assistance but this may involve giving the alarm by such means as blowing a whistle or getting to an emergency pushbutton, and he may be prevented from doing either of these things. The object of the invention is to provide a system by which it is possible to monitor at a remote location the movement of the officer so that if he fails to reach a particular check point at a particular time this fact is indicated at once.

The invention consists of a location system comprising a radio transmitter to be carried by a watchman or security guard, the radio transmitter including a loop aerial and a loop demodulator, a plurality of frequency generating means, hereinafter called loop carrier frequency generators each generating a loop carrier frequency and a location frequency by which the loop carrier frequency is modulated, the generators being located at selected points in the area to be patrolled by the watchman or security guard, each location frequency being different and being indicative of the location of the associated generator, means for installation at a monitoring point to receive the transmitted demodulated carrier wave including filters by which the particular location frequencies may be recognized, and means by which the receipt of each particular frequency is indicated.

To promote a full understanding of the invention one embodiment thereof will now be described, by way of example with reference to the accompanying schematic drawings, in which:

FIG. 1 shows the apparatus carried by the officer and two inductive loop frequency generators;

FIG. 2 shows the apparatus at the receiving or monitoring point;

FIG. 3 shows the panel of a suitable indicating device.

Referring first to FIG. 1, there is shown an ordinary mobile pocket radio transmitter (less microphone) indicated by a dotted rectangle 11. The rectangle 11 contains a block representing the radio transmitter with a transmitting aerial 12*a* and having connected to it the transmitter modulator 13. This mobile transmitter may be very small and may be a pocket V.H.F. transmitter of the kind carried by policemen who are on ordinary patrol duties covering different beats. In addition to the transmitting apparatus 11 the officer carries further apparatus indicated by the block 14 together with a loop aerial 15 connected to the block 14 by means of a rod or cable. The block 14 contains a loop detector and a loop demodulator.

At different points in the area to be patrolled by the officer is a plurality of conventional inductive generators for generating both a carrier frequency and a location frequency, two of which are indicated at 16 and 17. Each of these inductive loop frequency generators is arranged to generate a main or carrier frequency and a location frequency by which the carrier frequency is modulated. The carrier frequencies are identical but each of the location frequencies is different so that the location of each particular loop frequency generator may be identified by the unique location frequency.

The loop aerial 15 carried by the officer is designed to receive the loop carrier frequency from each of the inductive loop frequency generators and this loop carrier is applied to the loop detector and demodulated by the loop demodulator contained in the block 14. The modulation frequency, which is, of course, the location frequency, is then applied to the modulator 13 in the officer's transmission equipment 11.

As the officer patrols the area in his charge the transmitter transmits a continuous carrier frequency and each time he passes near one of the inductive loop frequency generators, as represented by 16 and 17, the particular location frequency is transmitted for a short period.

At a location remote from the area being patrolled by the officer is a monitoring apparatus consisting of a receiver 18 having a receiving aerial 18*a* and tuned to the particular carrier frequency which the radio transmitter carried by the officer is transmitting. The output of the receiver 18 is passed to a demodulator 19 and the demodulated output is passed through a series of filters 20 each one of which responds to one of the location frequencies. Whenever one of the location frequencies is received the particular frequency is recognized by one of the filters and is caused to provide an indication of its presence, for example, by operating a relay which lights a lamp on an indicator 21.

FIG. 3 shows a suitable form of indicator 21 which may consist of a front panel 22 having 10 circular bezels each of which contains a glass window 23, which may be colored if desired. The 10 indicators are numbered and a lamp is provided behind each window. It may be arranged that once one of the lamps behind a window 23 has been illuminated by the receipt of one location frequency it will remain illuminated until another location frequency is received, when the indicator corresponding to the location of the new frequency is illuminated and the previously illuminated indicator is extinguished. This mode of operation may conveniently be achieved by the use of relays.

The indicator shown in FIG. 3 in only exemplary and indicating means suitable for any desired number of different locations may easily be provided.

It will be evident from the foregoing description that the system according to the invention offers many advantages. In the first place it is possible continuously to monitor the movements of the officer. If he does not arrive at a particular place by a particular time then it is known that something is not as it should be, which may be due either to a failure of duty on the part of the officer or to some other cause. Not only does the invention make it possible to detect quickly the kind of condition which the officer is intended to detect, i.e., the presence of intruders or fire, but the monitoring system will also give an indication if the officer should have an accident or be taken ill so that he is unable to continue his patrol.

We claim:

1. A security system comprising signal receiving and transmitting means to be carried by a watchman or security guard, a plurality of inductive frequency generating means for generating a loop carrier frequency and a predetermined location frequency for modulating the loop frequency, said generating means being located at selected points in the area to be patrolled by the watchman or security guard, said signal receiving and transmitting means comprising a loop aerial for receiving both the loop carrier frequency and the location frequency generated by said generating means as the said guard nears said generating means and a loop demodulator for demodulating the received signal, said signal receiving transmitting means being adapted to transmit the said demodulated signal to a second receiving means for receiving said signal, said second receiving means including a plurality of filters by which the particular location frequencies may be recognized,

and indicating means for indicating the receipt of each particular location frequency by said second receiving means.

2. A system as claimed in claim 1 in which the radio transmitter is a V.H.F. transmitter.

3. A system as claimed in claim 1 in which the indicating means comprises an indicator panel having a number of windows each corresponding to one of the locations, a lamp behind each window, and means responsive to the recognition of the respective modulating frequency to cause the lamp to be illuminated.