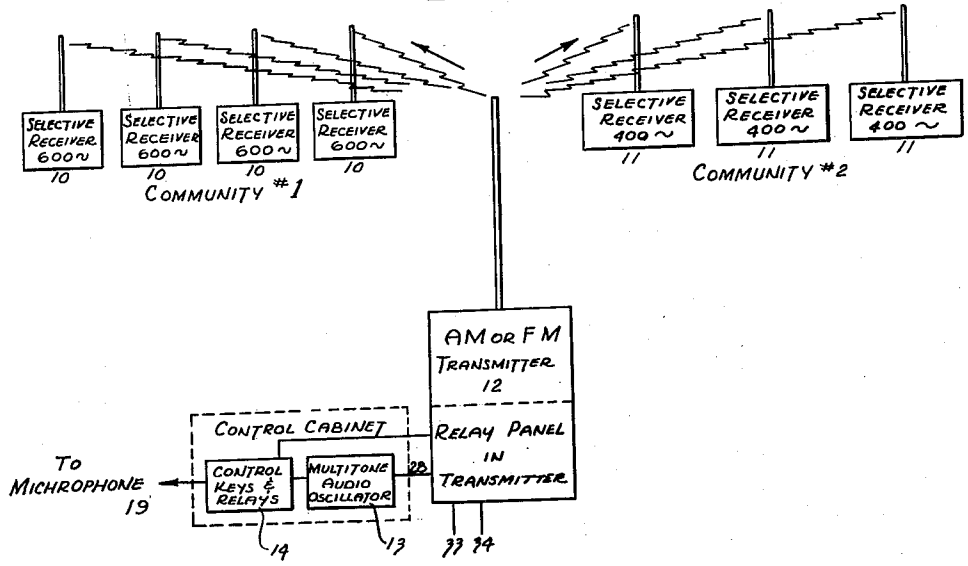
Dec. 30, 1952 P. E. FISCHLER 2,623,991

RADIO SELECTIVE ALARM SYSTEM WITH A CENTRAL TRANSMITTER

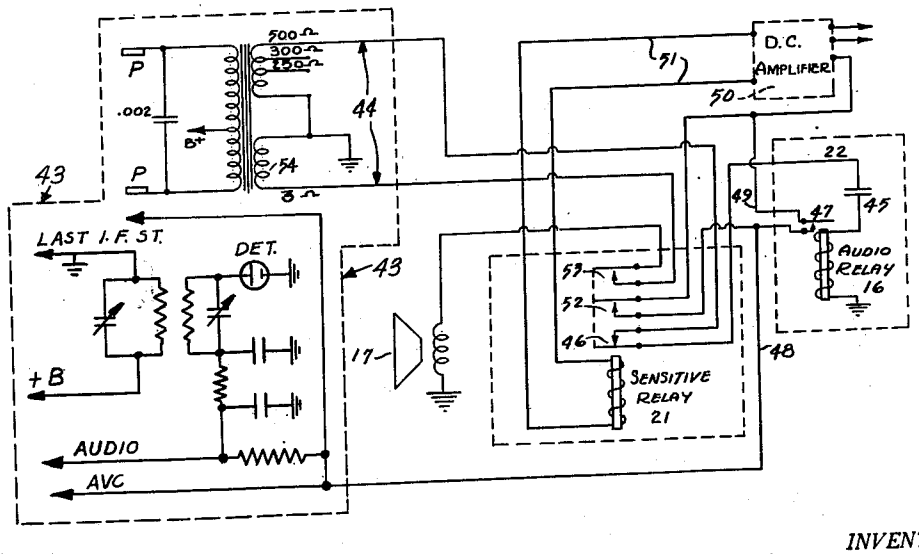
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FIG. 1



CENTRALLY LOCATED TRANSMITTER
SEE FIG. 2

FIG. 3



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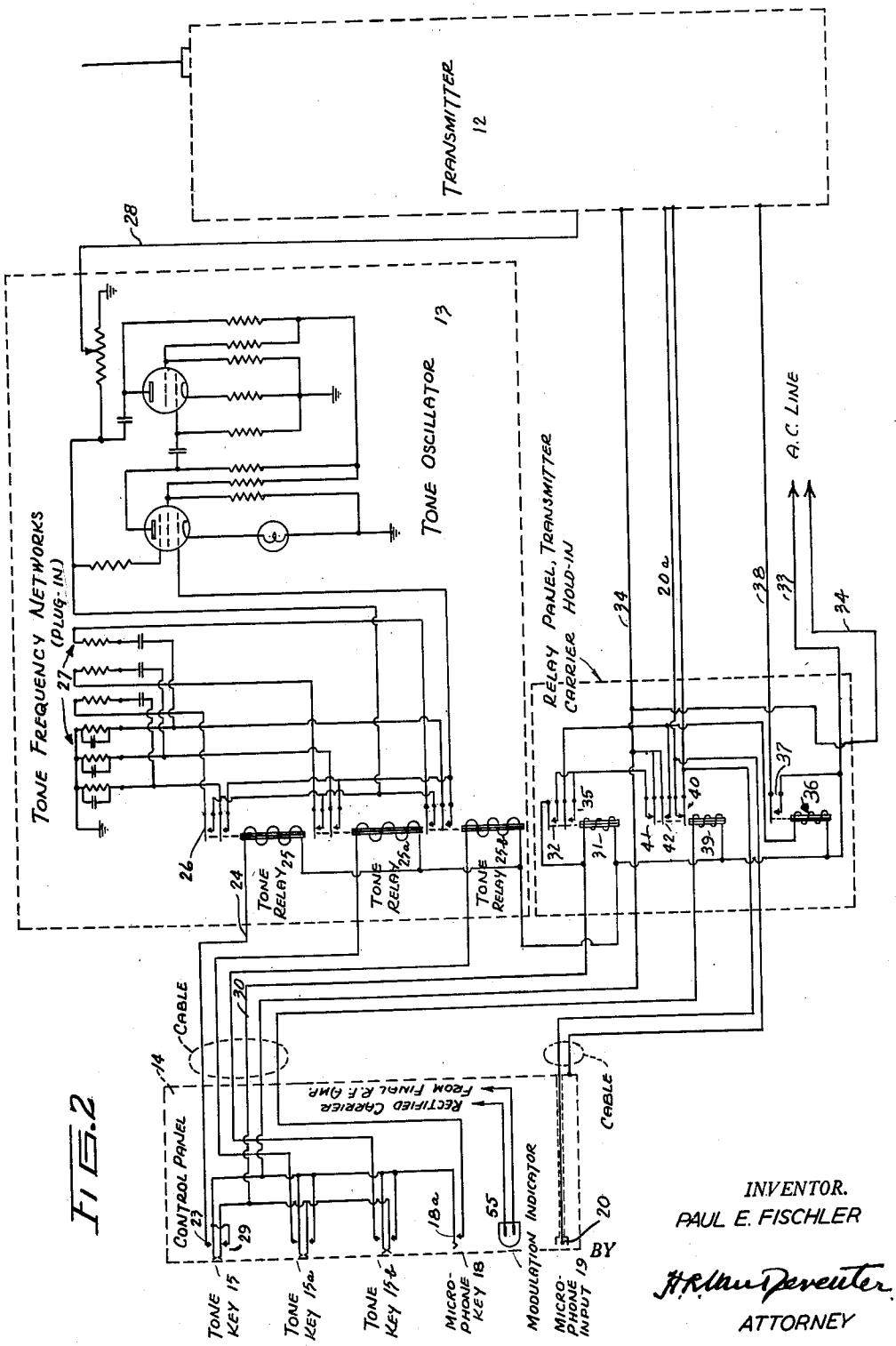


FIG. 2

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RADIO SELECTIVE ALARM SYSTEM WITH A CENTRAL TRANSMITTER

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3 Claims. (Cl. 250—17)

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This invention relates to radio selective alarm systems with a central transmitter.

An object of the system is to provide a system particularly suited for use as a fire alarm or first aid call system although it may be used for any other purpose for which it is adapted.

Another object is to provide a system of the class described wherein the operations necessary to broadcast air alarms are reduced to a minimum and wherein no preliminary adjustments, tuning or the like are necessary to instantly broadcast an alarm.

A further object is to provide a system of the class described wherein known types of transmitters and receivers may be used by the addition of certain auxiliary apparatus as hereinafter described.

Other objects and advantages will be apparent from the following specification wherein by way of illustration a preferred embodiment of the invention is disclosed. It will be understood, however, that what is herein described is merely by way of illustration and is not limitative, as many modifications will be apparent to those skilled in the art. The invention is therefore as defined by the appended claims.

In the accompanying figures:

Figure 1 is a diagram of the invention as applied to a community fire alarm system;

Figure 2 is a diagram of the transmitter and control equipment used in the system shown in Figure 1; and

Figure 3 is a diagram of one of the receivers used in the system shown in Figure 1.

The invention will be described as applied to a rural or suburban fire alarm system serving two communities, but more than two communities or groups of receivers can be operated if desired.

Referring to Figure 1 the system comprises a plurality of receivers 10, 11 which all operate on the same RF carrier frequency. For the sake of illustration, in Figure 1 the receivers are assumed to be located in adjacent communities, those indicated by the numeral 10 operating with a 600 cycle modulation tone (frequency) superimposed on the carrier frequency of the transmitter 12, and those indicated at 14 on 400 cycles. Additional groups can easily be provided and each group selectively operated by a different tone frequency as hereinafter described.

The receivers 10, 11 may be either AM or FM, depending upon the type of transmitter used and may be of any suitable construction. The system may operate in the UHF spectrum and the antennae used may be of the half-wave dipole type.

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The output circuits of the receivers are modified as hereinafter described.

The transmitter 12, of any suitable type to produce a RF carrier wave is provided with a multitone audio oscillator 13 to produce a plurality of modulation tones to modulate the carrier which may also be speech modulated. Control apparatus 14 is also provided all as hereinafter described.

General description of operation

Referring to Figures 2 and 3, to select a desired receiver 10 or 11 (or all receivers tuned to the same RF frequency), the operator at the transmitter proceeds as follows:

One of the audio tone keys 15, 15*a*, 15*b*, is depressed for 10 or 15 seconds. The carrier wave of transmitter 12 is thereby modulated with the desired audio tone which is intercepted by all receivers. Only those receivers whose audio relays 16 are tuned to the transmitted audio frequency will be responsive to this signal.

During the period of tone aforesaid, the audio relay 16 in the selected receiver or group of receivers operates to energize relay 21 in said receiver or receivers to start. The time required for this sequence of operations at the receiver is approximately one second.

During this second, the speaker 17 in the receiver is connected to the receiver output and operated by the broadcast audio tone and for the remaining time the key 15 is held depressed—say for 14 seconds—the speaker broadcasts an alert signal similar to the usual air-horn signal.

The operator now releases key 15 and depresses the microphone key 18. The carrier current on the transmitter remains "on" when key 15 is released as presently described and is now speech modulated via the microphone 19 plugged into the jack 20 and the operator verbally broadcasts any desired information.

When key 18 is released, the carrier is cut off the transmitter 12, thereby causing loss of voltage at the output 44 of receiver 10 which de-energizes the sensitive relay 21 which opens the circuit to speaker 17 and also restores the circuit 22 to audio relay 16 in preparation for the next call.

Detailed description of transmitter and control circuits

Referring to Figure 2, while three tone keys 15, 15*a*, 15*b* are shown with their associated tone relays 25, 25*a*, 25*b* as the operation of all three control circuits is the same, only one will be described.

Actuation of the first key 15 closes its contacts

23 thereby closing the circuit 24 through tone relay 25 which, via its contacts 26 selects a resistance-capacitance network 27 which determines the frequency of the tone produced by the output of the oscillator 13 connected to the audio or speech amplifier of transmitter 12 at 28.

Contacts 29 of key 15 also (at the same time) close the circuit 30 through the carrier hold-on relay 31 which locks itself in closed position via contacts 32 thereon across power supply circuit 33, 34.

Contacts 35 on hold-on relay 31 close to complete a circuit through plate supply relay 36 whose contacts 37 close to supply current via conductor 38 to the plate supply circuit of transmitter 12 and the signal tone is broadcast to the selected receiver 10 and heard via speaker 17 therein.

After 10 or 15 seconds the operator releases key 15 and removes the modulating tone from transmitter 13 by releasing tone relay 25. However, by reason of the locking contacts 32 on the hold-on relay 31 and contacts 37 on plate supply relay 36, the transmitter remains in operation to broadcast its un-modulated carrier wave, current being supplied to the plate supply primary therein via conductor 38.

If now the operator closes the normally open microphone key 18 (the second to be used), the contacts 18a thereof close to complete a circuit through microphone relay 39 which opens its normally closed contacts 40 connected to the microphone speech input 20a to the transmitter, permitting the microphone 19 to operate to modulate the carrier current of transmitter 12 with speech. At the same time contacts 41 of this same relay 39 open to release the locking circuit (via contacts 32) of hold-on relay 31. However, contacts 42 of relay 39 close to maintain plate supply relay 36 closed, thereby keeping the plate supply current on conductor 38 to keep the transmitter in operation to broadcast.

Restoring the microphone key 18 to open circuit position releases relay 39, closing contacts 40 and disabling the microphone 19. This also opens contacts 42, disabling relay 36, the contacts 37 of which disconnect the line voltage from plate supply 38 of the transmitter, thus stopping the broadcast. The neon lamp modulation indicator 55 may be mounted on panel 14.

Detailed description of receivers and control circuits necessary for use with the system

Referring to Figure 3 a radio receiver is shown in block form with its output circuit and the control circuit shown in detail.

The receiver proper as indicated within the dotted line 43 may be a conventional radio receiver of any suitable type having the plates P of its audio output connected to the output circuit 44 which in turn is connected to a series resonant circuit including condenser 45 and the winding of the audio relay 16 which may be of the type disclosed in the co-pending application, Serial Number 24,789, dated May 3rd, 1948.

As stated above, the receiver may be of any suitable type and no attempt has been made to show all of the circuits of same, the only modification necessary with many well known receiver circuits being the addition to the receiver of the parts shown in Fig. 3 outside the dotted line 43.

When the proper audio tone appears across 44, the resonant circuit is energized. This circuit serially includes contacts 46 on the sensitive relay 21. When the audio relay 16 closes its contact 47, the carrier control circuit 48 of the receiver is connected to the input circuit 49 of the D. C. amplifier 50. This causes current to flow in the output circuit 51 of amplifier 50 and relay 21 is energized thereby.

Activation of relay 21 opens the circuit to audio relay 16 at contacts 46 and simultaneously the contacts 52 of relay 21 close to maintain the carrier control circuit 48, 49 closed to the amplifier 50.

Contacts 53 of relay 21 also close to connect speaker 17 through the 3 ohm winding 54 of the output transformer in receiver 43 to ground, so that the speaker operates as previously described to sound the tone signal broadcast from the transmitter.

Relay 21 remains locked in operated position as long as carrier energy is received by the receiver to provide a voltage from the receiver carrier control circuit 48 to the input 49 of the amplifier 50, as relay 21 is directly across the amplified output circuit 51.

Thus, if the receivers are located at the homes of members of a volunteer fire department, this selective alarm system alerts the members and makes known to them the location of the fire without disturbing the community or causing traffic congestion at the scene of the fire. In the event of first-aid calls, it permits the members of the emergency squad to be summoned with maximum speed.

The system herein described can be installed at a minimum expense; no poles or wires are required. As all the firemen are called at once, and the general call repeated as often as necessary, much precious time can be saved as compared to calling individual firemen by telephone.

What is claimed is:

1. In a system of the class described, a radio transmitter adapted to broadcast a carrier wave, a first key having normally open contacts, a tone relay and a first circuit therefor including some of said contacts and a source of current for operating said relay, means for modulating the carrier wave of said transmitter with an audio tone, means controlled by the operation of said relay for connecting said modulating means to said transmitter to broadcast the resultant wave, a hold-on relay in said first circuit having contacts adapted to close the plate circuit of said transmitter, said hold-on relay having contacts in a second circuit serially including a plate supply relay and said current source, said hold-on relay having a locking contact whereby same is locked in operating position whereby said first key can be moved to open said first-mentioned contacts and both said relays remain energized to permit broadcasting of the unmodulated carrier wave, a second key having normally open contacts, a circuit serially including said last contacts and a microphone relay having contacts, a microphone having a circuit controlled by said last contacts, said microphone relay having contacts in circuit with the locking contacts of said hold-on relay to release same while said microphone relay remains operated to permit speech modulation of the broadcast carrier current, said second key when restored to open circuit position opening said circuit to said microphone relay, thereby disabling said plate supply by releasing relay to stop the broadcast.

2. In a selective calling system of the class described, a tone frequency network including an oscillator and adapted to generate a plurality of tones, manually controlled means for selectively switching said network to obtain a desired

tone including a tone relay, a key and a hold-on relay controlled by said key, said hold-on relay having contacts operable to lock itself in circuit to hold said tone relay in operated condition, means controlled by said hold-on relay for connecting said network to a transmitter, a transmitter connected to said hold-on relay, said hold-on relay having contacts controlling the transmitter plate supply circuit, a microphone, a microphone key for connecting said microphone and transmitter whereby said microphone may modulate the tone frequency of the transmitter, said last key, upon being restored to non-operating position, terminating the broadcast, and means controlled by said microphone key for releasing said hold-on relay.

3. A radio transmitter including an amplifier and a plurality of tone frequency networks, manually operated keys each having an operating position for connecting one of said networks to said transmitter to modulate the carrier wave thereof and thereby broadcast a tone modulated signal, a hold-on relay common to all said keys and operated by each of said keys to maintain said transmitter in carrier-current operation upon the release of any operated key to continue the broadcast of the carrier wave only, and manually controlled means for connecting a microphone to said transmitter to speech modulate said carrier wave subsequent to the release of any operated key, said hold-on relay being de-energized by the operation of said manually controlled means.

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