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TWO-SIGNAL RECEIVING DEVICE

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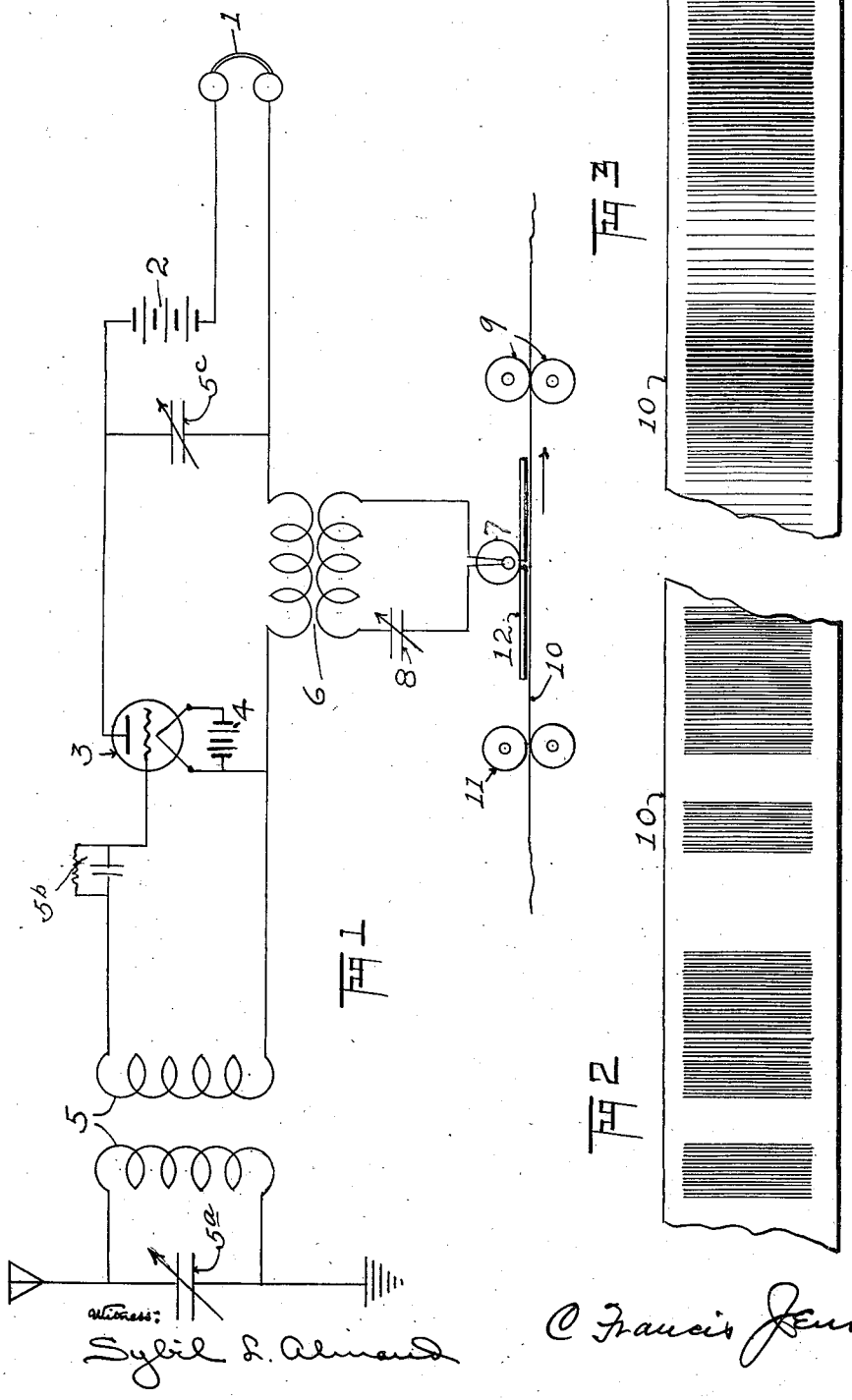


FIG 1

FIG 3

FIG 2

Witness:
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TWO-SIGNAL RECEIVING DEVICE

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Refiled for abandoned application Serial No. 727,272, July 21, 1924. This application August 29, 1927, Serial No. 216,295

1 Claim. (Cl. 250—9)

This invention relates to signal systems, and with particularity to a system for transmitting and receiving two different messages on a single wave.

An object of the invention is to provide a method of receiving signals corresponding to different messages or receiving the signals corresponding to one message in spaced or modulated groups with the impulses within the group received at a frequency outside the range of audible frequencies, and at the same time utilizing the group spacing for modulations to receive another message.

Another object of the invention is to provide a method of receiving simultaneously on a single carrier two separate messages, one of which is confined to the audible frequency band, the other of which is confined to the super-audible frequency band.

Another object of the invention is to provide a method of receiving and indicating simultaneously on a single carrier, signals in the super-audible range, and other signals in the audible range.

Another object is to provide a method of receiving on a single carrier and indicating signals which may be reproduced visually, and simultaneously receiving on said carrier signals which may be reproduced audibly.

In the drawing:

Fig. 1 is a schematic wiring plan embodying the invention; and

Figs. 2 and 3 are illustrative sections of a recording ribbon which has been used therewith.

Referring now more particularly to the accompanying drawing, the reference character 1 indicates a pair of head phones; 2 a battery in circuit therewith; 3 an electron tube; 4 a filament battery; 5 an antenna coupling; 5^a represents a variable condenser for tuning the receiver to the frequency of the incoming carrier; 5^b represents a conventional condenser grid leak combination for enabling the tube 3 to act as a detector although other equivalent detection means may be employed; 6 a coupling transformer to a circuit having a high frequency lamp 7 therein, for example, a neon or other gas glow lamp; 8 an adjustable condenser therein; 9 a pair of rollers, the rotation of which gives longitudinal movement to the light snsitive film 10 in the direction of the arrow; 11 indicating rollers to maintain the film taut; and 12 is an apertured mask between the light and the film to restrict the exposure of the film to an elemental strip transversely of the film.

It is obvious that any audible signals can be heard in the head phones. This is true even when the radio carrier wave has interruptions therein, provided only that the interruptions are frequent enough to be above audibility. These inaudible breaks in the carrier wave, however, can be recorded on the photographic ribbon, if the lamp 7 is capable of lighting and going out at such high frequencies, and a neon gas filled lamp has this property.

This is true because the condenser 5^c shunts the super-audible modulations around the telephones 1, so that these super-audible modulations are confined to the transformer 6. However, in accordance with well known theory of grid-leak detectors, the tube 3 in conjunction with the grid condenser and leak resistance combination 5^b, detects both the super-audible variations and the audible variations. The audible variations can be heard in the telephones, whereas the super-audible variations are passed through the condenser 5^c, and the primary of the transformer 6. As is well known, the telephones 1 are incapable of responding to the high or super-audible frequencies, but can readily respond to the audible frequencies. In other words the condenser 8 may be tuned to the super-audible frequencies, and thus the circuit including the transformer secondary and the condenser 8 functions to prevent the passage of any low or audible frequencies to the lamp 7. As is well known, a neon lamp is capable of responding without substantial inertia effects at super-audible frequencies. The use of such lamps in sound recording systems is well known, and such systems are capable of recording frequency variations of the order of 3000 or more cycles. Consequently all that is necessary is to speed up the movement of the reproducing film 10 so that the super-audible frequencies are properly recorded thereon, as indicated schematically in Figs. 2 and 3 of the drawing.

It will be seen, therefore, that (1) the audio signals can be received and translated by the head phones; and at the same time (2) the inaudible-frequency breaks in the carrier wave can be recorded on the swiftly running film, each without interfering with the other. It will also be apreciated that these changes in the carrier wave can just as successfully be modulations as long as these frequencies are above audibility.

The reception of carrier wave breaks would be recorded as a series of sharply separated dark areas on the film (Fig. 2), whereas a modulated

record would appear as different degrees of density along the film, as in Fig. 3.

It will be understood therefore that two different classes of message currents may be received simultaneously on the same carrier wave length. For example one current may correspond to an audible message while another current may correspond to a visual message.

Accordingly, while the drawing shows two specific types of signal indicating devices, it will be understood that this is merely illustrative and that the broad features of the invention may be employed in any system where two separate messages are to be transmitted on the same carrier.

The principal object therefore is to provide means whereby two different classes of signals may be received and detected by means of a single tuning. Various arrangements have been suggested heretofore for transmitting more than one signal on a carrier, for example the so-called plural modulation scheme, wherein two separate sustained waves are employed, one acting as the carrier proper and the other acting merely as a modulating wave for the main carrier. In other words, in such plural modulation schemes the carrier proper is not modulated directly by one signal device, but is modulated through the intermediary of another sustained wave. By the present invention this plural modulation is avoided since the carrier proper is directly modulated by both signals without requiring the generation of an intermediate frequency for one of the signal devices.

Accordingly the present invention provides means whereby a single demodulator may be employed at the receiving station to detect both classes of signals, thus requiring only a single tuning and single demodulation.

The present application is filed to take the place of an application filed by me July 21, 1924, Serial Number 727,272.

This application is related to my Patent No. 1,976,785, issued October 16, 1934, which shows apparatus for transmitting a wave of the type herein described.

What is claimed is:—

In a signaling system the method which consists in transmitting message signals to a signal reproducing device only at super-audible irregular signal frequencies, said signals being transmitted in groups comprising two or more signals, the transmission period of a group being shorter than the period essential for the establishment of an audible wave, and visually indicating said signals.

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