Sept. 20, 1938. W. H. MARTIN 2,130,468

SIGNALING SYSTEM

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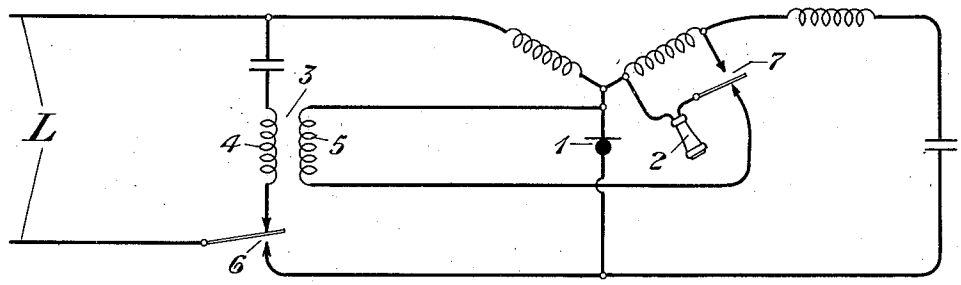


Fig. 1

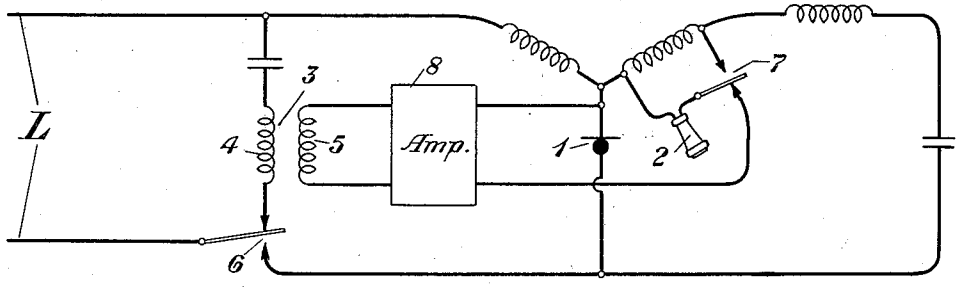


Fig. 2

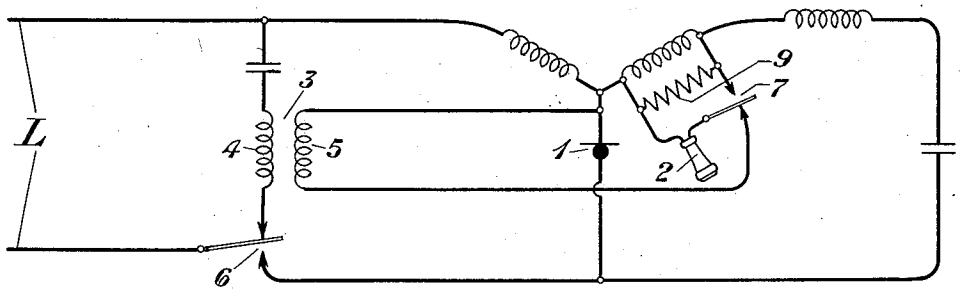


Fig. 3

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SIGNALING SYSTEM

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2 Claims. (Cl. 179—81)

This invention relates to telephone systems and more particularly to improvements in signaling arrangements associated with such systems.

One of the primary objects of the invention consists in providing improved signaling arrangements at a telephone subscriber's station set, particularly in station sets of the so-called combined type in which all of the apparatus both for talking purposes and for signaling purposes is located in one mounting. In combined station sets, that is, station sets in which all of the apparatus usually placed in the bell box is located in either the desk or wall mounting, a controlling element in the size of the mounting is the ringer apparatus. Accordingly, it is an object of the invention to provide arrangements for producing a ringing signal which are much smaller in size and materially cheaper than the usual ringing apparatus so that the size of the mounting need not be materially increased. In the arrangements of the invention the telephone receiver itself may be used to produce the audible call signal. Circuit arrangements are provided which normally connect the receiver to the line for signaling purposes when the receiver is on the hook and the signaling or ringing circuits due will cause the receiver to produce an audible call signal. This may be accomplished by the type of ringing current used or by the characteristics of the local circuit provided. When the receiver is removed from the hook the local signaling circuit is disconnected and the receiver connected to the line in the usual manner for talking purposes. Such an arrangement has the advantage that it requires the addition of very little apparatus to the subscriber's talking set in order to produce a call signal and hence will not materially increase the size of the mounting in so-called combined station sets. Other objects and features of the invention will appear more fully from the detailed description thereof hereinafter given.

The invention may be more fully understood from the following description together with the accompanying drawing in the Figures 1, 2 and 3 of which the invention is illustrated. Figure 1 is a circuit diagram embodying a preferred form of the invention. Fig. 2 and Fig. 3 are circuit diagrams illustrating modifications thereof. Similar reference characters have been utilized to denote like parts in all of the figures.

In Fig. 1 is shown a telephone line L terminating at a subscriber's station of the so-called combined station set type. A telephone transmitter 1 and a receiver 2 are shown. The switchhook contacts are 6 and 7 and when the receiver is on the switchhook the contacts 6 and 7 are in the position shown. Bridged across the line L, when the receiver is on the switchhook, is the primary winding 4 of a transformer 3. The secondary winding 5 of the transformer is connected in circuit with the receiver 2 when the receiver is on the switchhook. The ringing current coming in over the line would cause this transformer to be saturated and the harmonic frequencies generated by this saturation would be supplied through the secondary of the transformer to the receiver 2. This would cause the receiver to give forth an audible sound which could be used as a call signal in place of the customary bell. Under certain conditions the transformer 3 might be eliminated. Such conditions would be, for example, if 1000 cycle ringing current was used and the receiver was designed to give a satisfactory signal in response to such current directly. When the receiver is removed from the switchhook in response to the signal the transformer is effectively disconnected from the line and the receiver is connected to the usual talking circuit.

In Figs. 2 and 3 are shown modifications of the invention which might be utilized to produce a louder call signal if desired. Fig. 2 is identical with Fig. 1 except that it might include in the circuit connected to the transformer 3 and to the receiver 2 an amplifier 8 which preferably would be of small size, such as the mechanical type. In Fig. 3 the receiver itself might be designed to give loud volume of sound. If this design was such that the volume was too loud for talking purposes, a resistance or other volume limiting device, such as 9, might be included in the talking circuit to cut down the volume of the receiver when utilized in the talking circuit.

While the invention has been disclosed as embodied in certain specific arrangements which are deemed desirable, it is understood that it is capable of embodiment in many and other widely varied forms without departing from the spirit of the invention as defined by the appended claims.

What is claimed is:

1. In a telephone system a subscriber's line over which alternating signaling currents and talking currents are transmitted, a subscriber's set connected to said line, said subscriber's set comprising a transmitter, a receiver, a set of switchhook contacts, a transformer having its primary winding bridged across said line only when said receiver is on said switchhook, and means for connecting the secondary winding of said transformer in circuit with said receiver only when said re-

ceiver is on said switchhook whereby said receiver may be directly and continuously actuated by the signaling currents transmitted over said line.

2. In a telephone system a subscriber's line over which alternating signaling currents and talking currents are transmitted, a subscriber's set connected to said line, said subscriber's set comprising a transmitter, a receiver, a set of switchhook contacts, a transformer having its primary winding bridged across said line only when said receiver is on said switchhook contacts, means for connecting the secondary winding of said transformer in circuit with said receiver only when said receiver is on said switchhook contacts, and means for utilizing the harmonic frequencies of said signaling current generated by the saturation of said transformer to cause said receiver in direct response thereto to produce an audible signal.

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