

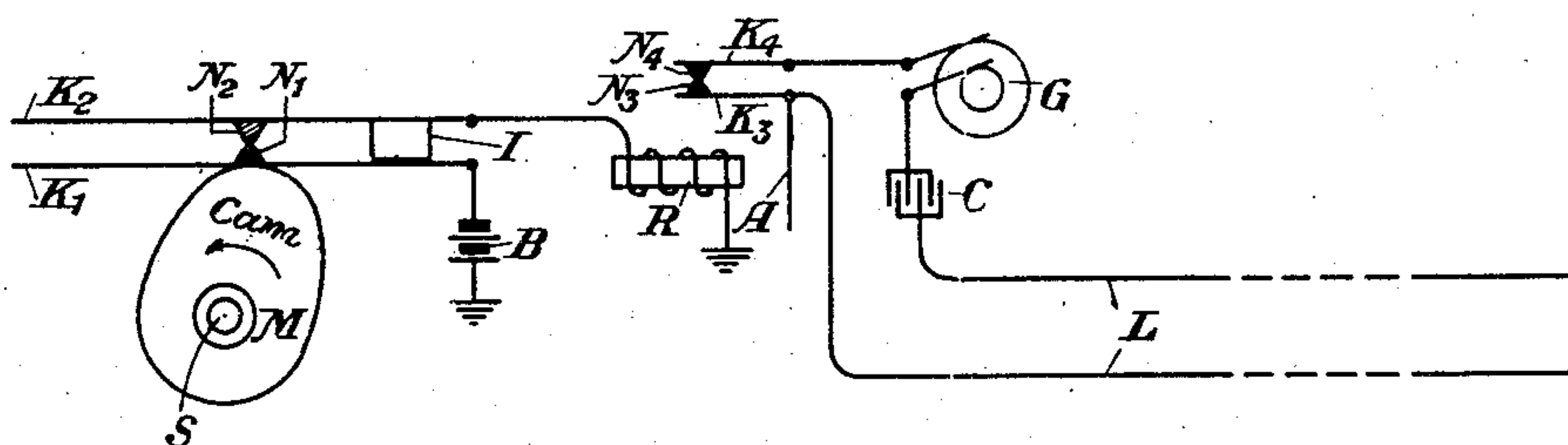
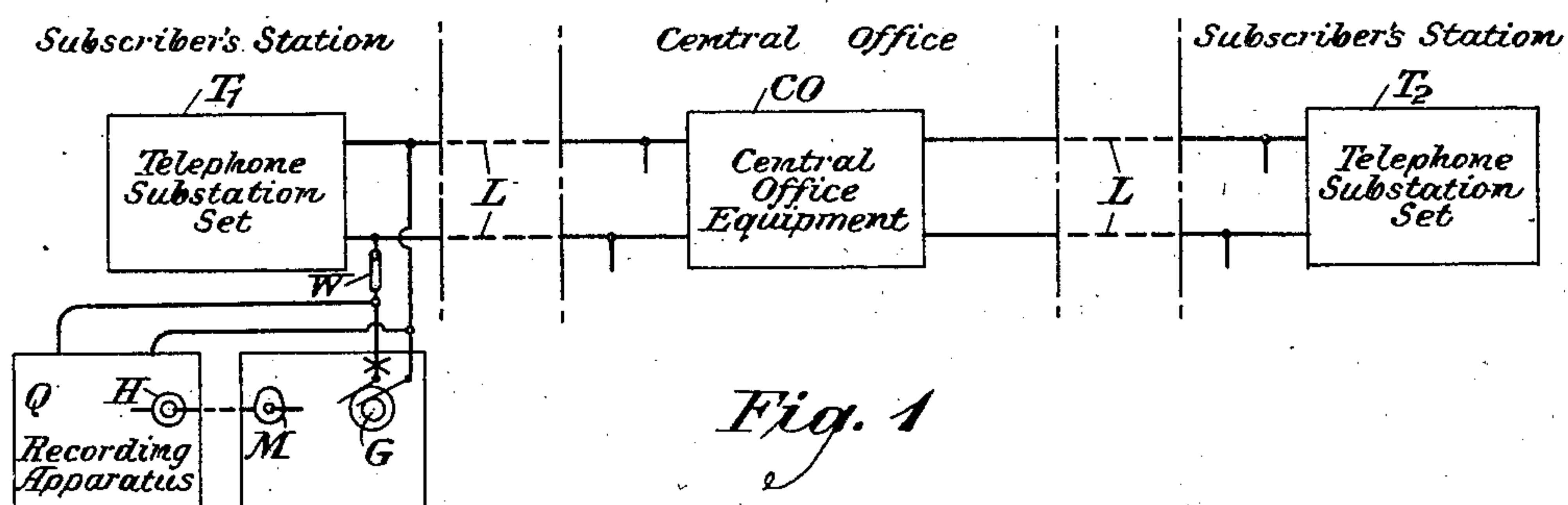
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SIGNALING APPARATUS FOR RECORDING SYSTEMS

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SIGNALING APPARATUS FOR RECORDING SYSTEMS

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This invention relates to signaling and recording systems. More particularly, this invention relates to improvements in and additions to apparatus for recording messages which may be transmitted over a signaling circuit, such as a telephone line. Still more particularly, this invention relates to arrangements for indicating that recording equipment, which may be connected to a telephone line, has been started in operation and remains in operation.

It is essential to any system for recording signals such as may be transmitted over a telephone line, that there be means for indicating that the recording apparatus has been started in operation. It is also important for the persons taking part in a telephone conversation to know that the recording apparatus connected to their circuit remains in operation. Without such information a subscriber would be unaware that his statements are being put into permanent form and might some day be reproduced to confront him, to his detriment or damage. A subscriber having such knowledge would probably become more cautious and conservative with his statements, as is generally the case with a witness in court when his remarks are being recorded.

This invention is intended to provide a signal at the instant recording apparatus is operatively connected to a telephone line. It is also intended to provide a similar signal at regular and predetermined intervals thereafter while the recording apparatus remains in operation. This signal may be rendered audible or visible, as may be found desirable. Moreover, this signal may be transmitted to the called party or to the calling party or to a telephone operator or to any two of these persons or all of them, and this signal will be transmitted simultaneously to these persons.

One of the objects of this invention is to notify a party to a telephone conversation that his conversation is being recorded.

Another of the objects of this invention is to apprise all the parties to a telephone conversation that their conversation is being recorded.

Still another object of the invention is to provide an indicating signal at the beginning of the recording process and to transmit that signal to all the parties to a telephone conversation which is being recorded.

And a further object of this invention is to provide an indicating signal not only at the beginning of the recording process but also at regular intervals thereafter throughout the recording process.

While this invention will be pointed out with particularity in the appended claims, it will be better understood, both as to its further objects and features, from the following description, when read in connection with the accompanying drawings, in which Figure 1 shows schematically a telephone circuit equipped with recording apparatus based on this invention, and Fig. 2 shows the details of the novel features of the arrangement required to carry out the invention.

Fig. 1 schematically shows one form of arrangement for recording a telephone conversation in accordance with the principles of this invention. One telephone subscriber having a telephone substation set designated T_1 and another subscriber having a similar telephone substation set designated T_2 are connected to each other through a telephone line L and this line may pass through a central office CO . The telephone substation sets at the subscribers' stations T_1 and T_2 may include, among other things, a telephone transmitter, a telephone receiver, and a ringer, and there may be similar equipment at the central office which may be connected to the line L . The equipment at the central office may operate in response to signals from either of the stations T_1 or T_2 or this equipment may be connected to the line L at the instance of the telephone operator at the central office.

The reference character Q represents apparatus for recording telephone signals. This recording apparatus may be located at or near stations T_1 or T_2 or at or near the central office CO . This recording apparatus may, of course, be connected to the telephone line L whenever desired merely by the closure of a switch W .

The recording apparatus Q may include,

among other things, a revolving turntable or cylinder holder H (not shown in detail) which is, however, well known in the art. The rotating device may be coupled to a cam mechanism M and the cam mechanism may control a source of current which may be an alternating current generator G, the details of operation of one form of which will be described in greater detail hereinafter.

The generator G may be one capable of producing current of any frequency, preferably an audible frequency suitable to effectively energize the telephone receiver or other electromagnetic device at the telephone substation sets T₁ and T₂ and the equivalent device at the central office CO. The generator G may, of course, be any form of electrical oscillator and it may be of the vacuum type, if desired.

Fig. 2 shows one form of arrangement for producing a tone signal suitable for transmission over line L. A cam M is mounted on a shaft S which is mechanically coupled to the revolving turntable or cylinder holder H, described in connection with Fig. 1 of the drawing. The cam M and the revolving device H may be connected directly, or indirectly through a geared train. Thus, the cam M will make a predetermined number of revolutions during each minute or during each interval of, for example, five minutes.

A metallic arm K₁ will follow the outer surface of the cam M and during each complete revolution the arm K₁ will make good electrical contact with another arm K₂ for a brief space of time which may, for example, be several seconds. During this short interval, the arms K₁ and K₂ will be in circuit with each other through a pair of metallic contacts N₁ and N₂ which are permanently connected to the arms K₁ and K₂, respectively. It will be obvious that the arm K₂ is stationary and that the arm K₁ is movable and, moreover, these arms may be brought into electrical contact with each other in any other well known manner. Furthermore, a bar of insulation I may, if desired, be placed between the arms K₁ and K₂, and it may be permanently fastened to either of these arms so that they may be maintained a predetermined distance apart, and this feature will be especially desirable if the arms K₁ and K₂ are equipped with contacts which are flexible.

The arm K₁ is connected to a battery B, one terminal of which is grounded. The arm K₂ is connected to the winding of a relay R, one terminal of which is also grounded. When the arm K₁ is brought by cam M into the position shown in the drawings, it will make suitable contact with the arm K₂ through the elements N₁ and N₂ and current will flow through the battery B, over contacts K₁ and K₂ and through the winding of the relay R, causing this relay to become operated.

The armature A of the relay R is permanently connected to an arm K₃ and these elements always move in unison. Whenever the winding of the relay R becomes energized, the arm K₃ will be brought into an electrical circuit with the arm K₄ through a pair of contacts designated N₃ and N₄. The fixed terminal of the armature A is connected to one side of the line L, while the arm K₄ is connected to one terminal of the alternating current generator G. The other terminal of the generator G is connected to the other side of the line L through a condenser C.

When the arms K₁ and K₂ are in circuit with each other, relay R will become operated and this relay will remain operated as long as these arms are so connected. During this period the generator G will send a pulse of alternating current over the arms K₃ and K₄, through the condenser C and over the line L. This pulse will be interrupted just as soon as the arms K₁ and K₂ are disconnected from each other. Shortly thereafter the cam M will again cause the arms K₁ and K₂ to make contact with each other and the generator G will then transmit another pulse of alternating current over the line L. Thus, the cam mechanism will cause pulses of alternating current to be transmitted over the line L and this will occur throughout the recording process. Inasmuch as the generator G produces an alternating current of a frequency within the range of audibility, the audible signal will be heard regularly and periodically at each electromagnetic receiver connected or otherwise coupled to the line L, and this signal will disappear when the recording mechanism ceases to function.

The relay R may assume any desired form. Its armature A may be equipped with a front contact which will become closed by the armature upon the operation of the relay. This front contact may extend to one terminal of the generator G and it will connect this generator to the line L through the series condenser C and the armature A. This construction will eliminate the arms K₃ and K₄ as well as their associated contacts N₃ and N₄.

The operating surface of the cam M has not been shown precisely in the shape it will have when used in carrying out the principles of this invention. This cam will have a surface which will quickly bring the arm K₁ into circuit with the arm K₂ immediately at the beginning of the recording process. The shape of the cam surface will also be such that the arms K₁ and K₂ will remain in contact with each other for a predetermined interval of time so that a clean-cut pulse of alternating current may be transmitted by the generator G over the line L. This cam mechanism will also be so arranged

that the contacts K_1 and K_2 will be positively disconnected from each other after the cam M has ceased to revolve. This will insure the disconnection of the generator from the line L after the recording process has stopped.

While it has been clearly stated that the current of the generator G will operate electromagnetic receivers which may be connected or coupled to the line L and create audible signals in these receivers, it will be understood that visible signals may, if desired, be produced. Those familiar with the art will realize that transformers, tuned circuits, filters or the like may interconnect one or more lamps or other visible indicating devices to the line L so as to produce suitable visible signals. Of course, if visible signals are employed, the frequency of the current of the generator G will not have to be within the range of audibility.

The generator G has been described as intermittently operated. If desired, the generator G may be continuously operated. This may be accomplished by rendering the surface of the device M circular and concentric with its shaft S so that the arms K_1 and K_2 will be in continuous circuit through their contacts N_1 and N_2 while the recording apparatus remains in operation. As an alternative, the generator G may be maintained in continuous operation during the recording process by directly or indirectly coupling this generator to the revolving turntable or cylinder holder H of the recording apparatus. It will be apparent that the generator G may be maintained continuously in operation during the recording process in still other ways, all within the scope of this invention.

The generator G may be replaced by a phonographic device or reproducer which will be operated either intermittently or continuously during the recording process, as desired. The record reproduced and transmitted over the line L may carry any predetermined signal, or any desired word, such as "recorder" or "record" or the like; or it may be any predetermined phrase or sentence.

The generator G may be replaced by a modulator to which may be connected a plurality of generators or oscillators producing currents having different frequencies which, when modulated, form a background tone suitable for transmission over the line L, which may also occur intermittently, or preferably, continuously. The background tone will be one of predetermined level and chosen as to frequency characteristics so as not to interfere with the ordinary speech signals which pass over the line L. This background tone will be recorded along with the speech currents and its presence may be used in determining the authenticity of the record. The background tone may, of course, be produced so as to vary periodically in its

amplitude, its amplitude being alternately increased or decreased.

This invention represents an innovation in the art of recording telephone messages. It permits recording operations to occur only with the knowledge of the persons engaged in the telephone conversation. The invention is intended to apprise the parties to the conversation that the recording process has started, and it continues to notify these parties at regular intervals or continually throughout the conversation.

While this invention has been shown and described in certain particular arrangements merely for the purpose of illustration, it will be clearly understood that the general principles of this invention may be applied to other and widely varied organizations without departing from the spirit of the invention and the scope of the appended claims.

What is claimed is:

1. The method of apprising a party to a conversation that his conversation is being recorded, which consists in generating a characteristic audible tone for transmission to said party and periodically reproducing that tone for said party at regular intervals during the recording operation.

2. The method of apprising a party to a telephone conversation that his conversation is being recorded, which consists in transmitting to that party an audible tone at the beginning of the recording process, periodically reproducing that tone at regular intervals during the recording process, and removing that tone at the end of the recording process.

3. The method of notifying a plurality of parties engaged in a telephone conversation that their conversation is being recorded, which consists in simultaneously transmitting to all of the parties an audible tone, and interrupting the tone transmitted to all of said parties at regular intervals of predetermined length.

4. The method of notifying a plurality of parties to a telephone conversation that their conversation is being recorded, which consists in transmitting to all of the parties an audible tone at the beginning of their recorded conversation and retransmitting the same tone to all of said parties at brief intervals throughout the recorded conversation.

5. The method of apprising a party to a telephone conversation that his speech is being recorded, which consists in producing and transmitting a characteristic phonographic tone to said party and reproducing and retransmitting that phonographic tone to said party at brief regular intervals throughout the recording process.

6. The method of operating recording equipment with the knowledge of a plurality of parties whose conversation is being recorded, which consists in transmitting an indicating signal to all of said parties at the

beginning of the recording process and at brief regular intervals thereafter during the recording process.

7. The combination of a telephone line, recording apparatus connected to said line, and cam-operated means controlled by the recording apparatus for indicating that the recording apparatus has started to record messages transmitted over said line.

8. Apparatus for recording signals transmitted over a telephone line, including means for indicating that the recording apparatus has started in operation, and automatic means for periodically indicating at regular intervals that the recording apparatus remains in operation.

9. Apparatus for recording signals transmitted over a telephone line, including automatic means for indicating at predetermined regular intervals that the signals are being recorded.

10. The combination of a circuit over which signals may be transmitted, recording apparatus coupled to said circuit, a source of alternating current controlled by the recording apparatus and connected to said circuit, and automatic means for periodically interrupting the flow of current from said source over said circuit at regular intervals.

11. The combination of recording apparatus, cam mechanism controlled by said recording apparatus, means for producing tone signals, and means controlled by said cam mechanism for periodically interrupting the tone signals.

12. A signal system comprising a line, a tone generator, recording apparatus, and means controlled by said recording apparatus for connecting said tone generator to said line at regular and predetermined intervals.

13. The combination of recording apparatus a generator of current of an audible frequency, and cam-operated means controlled by said recording apparatus for periodically interrupting the current of said generator, said cam-operated means coupling said generator to said recording apparatus.

14. The combination of a telephone line, recording apparatus connected to said line and having a revolving member, an alternating current generator, and cam controlled means responsive to the action of the revolving member of said recording apparatus to connect said generator to said line.

15. The combination of a telephone line, a plurality of telephone substation sets connected to said line, each having a telephone receiver, recording apparatus connected to said line, said recording apparatus having a revolving member, an alternating current generator having a frequency audible in the telephone receivers of the substation sets, and cam mechanism controlled by the revolving member of the recording apparatus to connect the generator to said line.

16. The combination of a telephone line, recording apparatus connected to said line, and means controlled by said recording apparatus for producing a back-ground tone for transmission over said line continuously during the operation of said recording apparatus.

17. The combination of a telephone line means for recording the messages transmitted over said line, means for producing a back-ground tone of predetermined characteristics, and automatic means for transmitting said back-ground tone over said line at regular intervals during the time the recording means is in operation.

18. The method of recording a telephone conversation with the knowledge of the party engaged in the conversation which consists in producing a characteristic back-ground tone of predetermined characteristics and transmitting that tone at regular intervals throughout the conversation.

In testimony whereof, I have signed my name to this specification this eleventh day of December, 1930.

CARROLL O. BICKELHAUPT.