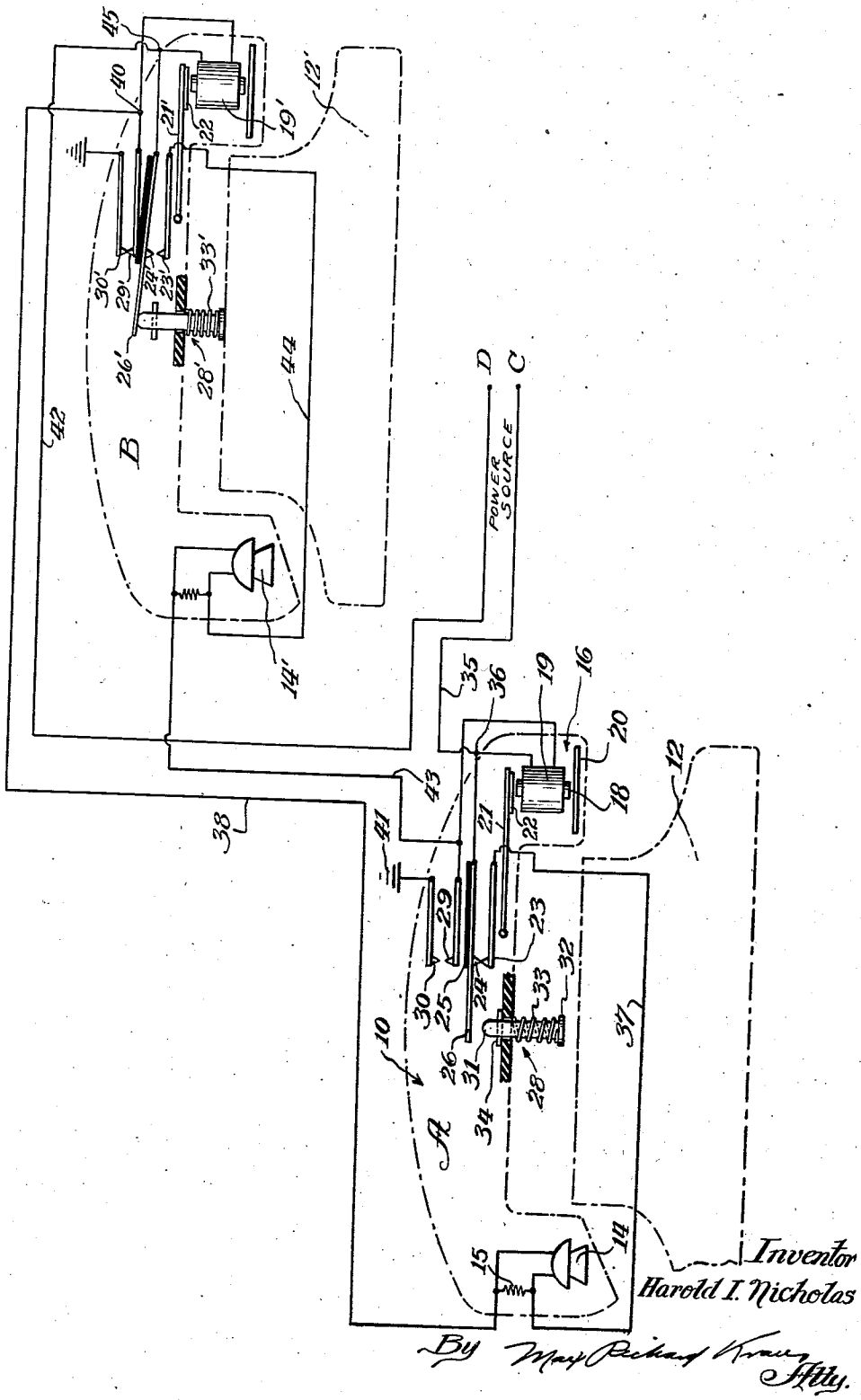
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TELEPHONE APPARATUS AND CIRCUIT THEREFOR

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TELEPHONE APPARATUS AND CIRCUIT THEREFOR

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3 Claims. (Cl. 179—1)

This invention relates to an improved telephone apparatus and circuit therefor.

Heretofore, it has been the practice, in the art, with particular reference to intercommunicating systems, to provide auxiliary bell signalling means for summoning a party to the telephone, to answer a call. That is, when a party desired to make a telephone call, after lifting the receiver off the hook switch or other supporting means, he was required to independently actuate some means whereby a call bell at the receiving end would be caused to operate. It is apparent that such a system necessitated the use of extra apparatus and the creation of extra circuits in addition to that required for the talking circuit alone. The use of this extra apparatus renders the manufacture of telephone equipment costly and additionally complicates the construction thereof, thereby increasing the scope of possible future repairs.

According to my invention, I have provided a telephone apparatus and a circuit therefor, for use in telephone intercommunicating systems, wherein upon the lifting of the apparatus from the supporting means, at the transmitting terminus, a call bell or signal is automatically actuated at the receiving terminus to summon a party to the telephone, the above operation being accomplished without the use of auxiliary apparatus or circuits normally used for such purposes.

It is to be understood that the term "telephone" wherever used shall include any means for reproducing sound signals of any character whatever.

Referring to the drawing which schematically shows one form of my invention, the numeral 10 indicates generally a telephone set of the cradle type supported on a suitable support 12. The telephone set 10 comprises, in combination, a transmitter 14 and a receiver 16 encased in a suitable housing. The transmitter 14 may be of the conventional type while the receiver 16 is of a modified construction to adapt it for its present use.

The receiver 16 comprises a magnetic core 18 provided with a coil 19 of wire wound thereon, intermediate its ends, and a diaphragm 20 positioned in close proximity to one end of said core. This construction constitutes substantially the conventional telephone receiver and its operation need not therefore be discussed. A reed member 21, suitably anchored in the housing and provided, at its free end, with an armature 22 is disposed proximately to the other end of the core 18 and is adapted to be actuated thereby and to be thrown into vibration in consequence of the changes in the magnetic field surrounding the core. It is the vibration of this reed member which serves the purpose of the conventional call bell in a telephone system. A resistance 15 may be shunted across the leads to the transmitter 14 for the purpose of intensifying the call signal produced by the reed 21.

It is thus seen, that I have provided, in a unit construction, a combined telephone receiver and call signalling means having a single magnetic core 18, and coil 19 wound thereon which serves to independently actuate both the reed 21 for call signalling purposes and the diaphragm 20 for the reproduction of articulate sound signals. By virtue of this construction, the use of any incidental call bells and coils or other signalling means are completely eliminated from my telephone system, thereby resulting in a substantial decrease in the number of parts used and in the simplification of the construction and electrical circuits.

Cooperating switch members 23 and 24, suitably mounted in the housing, serve to actuate the talking circuit in the instant telephone system. The switch member 24 is provided with a layer of insulating material 25, as shown, and an extended portion 26 which is adapted to engage the contact breaker 28, presently to be described. Another pair of cooperating switch members 29 and 30 are suitably mounted in the housing and serve to actuate the signalling circuit of the telephone system.

The contact breaker 28 consists of an elongated rod member 31 provided with a shoulder 32, at one end, and adapted to slide in a suitable aperture in the housing. A spring 33 abuts the shoulder in the housing and serves to urge the contact breaker outwardly. A pin 34 extending through the rod serves to limit the outer movement thereof. It is to be understood that the apparatus, both at the transmitting and at the receiving termini, are exactly identical in construction. In view of this, only one set of telephone apparatus has been described.

The telephone set, indicated by the letter "B" is shown in normal out of use position and carried on its support. In this position, the spring 33' is compressed and the contact breaker 28' is urged inwardly to engage the extended portion 26' which is thereby elevated to cause the switch members 29' and 30' to contact each other. However, the contact portions of the switch members 23' and 24' are thereby separated.

When the telephone set is elevated from its

support, as in the case of telephone set "A," contact breaker 28 is urged outwardly away from the extended portion 26 which returns to normal position causing the switch members 23 and 24 to contact with each other, but causing the other switch members 29 and 30 to separate, breaking contact between themselves.

The telephone apparatus is shown energized by a power source which may consist of batteries, a source of direct current supply, a rectifying unit of the type shown and described in my copending application Serial No. 255,376 or any other suitable rectifying means. I have obtained excellent results by the use of my rectifying unit, in combination with the telephone apparatus, herein described.

For a better understanding of the operation of my telephone system it might be well to trace the flow of current through the various circuits.

Assuming that telephone A is lifted from its support 12, preparatory to calling the party at telephone B, it will be seen that the switch members assume the position shown in telephone A, with the switch members 23 and 24 in contact with each other while switch members 29 and 30 are separated. In telephone B which remains on the support 12', the switches assume the position indicated, with switches 29' and 30' in contact with each other and switches 23' and 24' separated and apart. The circuit is now in condition for actuating the signalling means to summon a party to the telephone.

With the switches positioned as described, the current will flow from the terminal C, of the power source, through conductor 35, through switch members 24 and 23, through conductor 37, through the transmitter 14, through conductor 38, dividing at 40 to flow through switch members 29' and 30' to the ground 41, and through the coil 19', through conductor 42 back to terminal D of the power source. The current flowing through the coil 19' energizes it and throws the reed 21' into vibration, thereby producing a call signal which serves to summon a party to the telephone.

When the telephone B is lifted from its support, the switch members assume relationships exactly as indicated in telephone A, with the switches 23' and 24' in contact with each other and switches 29' and 30' separated. The circuit is now in condition for talking purposes. A current will now flow from terminal C, through conductor 35 through switch members 24 and 23, through conductor 37, through transmitter 14, through conductor 38, through coil 19', through conductor 42 and back to the terminal D of the power source.

The circuit, above described, serves to transmit articulate sound signals from telephone A to telephone B. Returning sound signals from telephone B to telephone A follow the circuit described below.

The current from terminal C flows through conductor 35, through coil 19, through conductor 43, through transmitter 14', through conductor 44, through switch members 23' and 24', through conductor 42 and back to terminal D of the power source.

It is desired to point out that the single coil and core, when energized, actuate either the diaphragm or reed member at any given time, depending upon whether at that particular time the coil is connected with the talking circuit or with the call signalling circuit. I do not desire to limit myself by advancing any theory regarding the phenomenon of a single coil and core independently actuating a diaphragm for the reproduction of articulate sound signals and also for actuating a reed for the production of call signals.

I have constructed a number of models in accordance with the description and operable as hereinbefore described and have achieved results in articulate sound transmission which are believed to be novel in the art. With my apparatus, articulate sound signals covering the entire range of the human voice have been transmitted and faithfully reproduced with a high degree of accuracy and without any distortion.

While the description of the signalling circuit has been with reference to summoning a party to telephone B, it will be understood that the party at telephone A may be similarly summoned to answer a call on that phone.

It is thus seen, that I have provided a telephone system which is automatic in its operation to summon a party to the telephone, to answer a call thereon, and which accomplishes the above without the use of auxiliary signalling means incidental to present day telephone or communicating systems.

While only two telephones are shown in circuit in the schematic diagram, it will be apparent that a plurality of telephones may be connected through a switchboard or other suitable control means whereby selective operation of said telephones may be effected.

It will be understood that it is not intended that my invention be limited to use only in telephone circuits but that it may be applied to any intercommunicating system employing sound transmission and receiving apparatus.

It is to be understood that the form of my invention herewith shown and described, is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of my invention or the scope of the appended claims.

I claim:

1. An intercommunicating system comprising a plurality of stations, each of said stations including a transmitter, a combined receiver and signaling means and switching means all encased in a housing which is removably supported on a support, said combined receiver and signaling means comprising an electro-magnet formed of a single core and coil, a receiver diaphragm disposed opposite one pole of said electro-magnet and a vibrable armature disposed opposite the other pole of said electro-magnet, means for actuating said switching means whereby when said stations are in out-of-use condition the signaling means of each station is connected in circuit and adapted to be energized to summon a party to answer a call, the energizing of the signaling means of a called station being effected when the transmitter and receiver of a calling station are removed from their support, the said switching means being thereafter actuated to disconnect the signaling circuit and to connect in circuit the transmitters and receivers of stations between which intercommunicating is desired.

2. An intercommunicating system comprising a plurality of stations, each of said stations including a transmitter, a combined receiver and signaling means and switching means all encased in a housing which is removably supported on a support, the said combined receiver and signaling means comprising an electro-magnet formed of

a single core and coil, a receiver diaphragm disposed opposite one pole of said electro-magnet and a vibrable armature disposed opposite the other pole of said electro-magnet, said electro-magnet adapted to be energized responsive to the removal of the receiver at the calling station for vibrating the armature at the called station to summon a party to answer a call, the electro-magnet of each station being thereafter energized to actuate the receiver diaphragms to reproduce articulate sound.

3. An intercommunicating system comprising a plurality of stations, each of said stations including a transmitter, a combined receiver and signaling means and switching means all encased in a housing which is removably supported on a support, the said combined receiver and signaling means comprising an electro-magnet formed of a single core and coil and having a vibrable armature opposite one pole of said electro-magnet and a receiver diaphragm opposite the other pole thereof, means carried in said housing and engageable with said support for operating the switching means of the calling station whereby the electro-magnet at the call station is energized to actuate the armature and to summon a party to answer a call, said means at the called station when the call is answered operating to actuate the switching means thereat to energize the electro-magnet whereby the receiver diaphragm is actuated to produce articulate sound.

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