

Feb. 16, 1937.

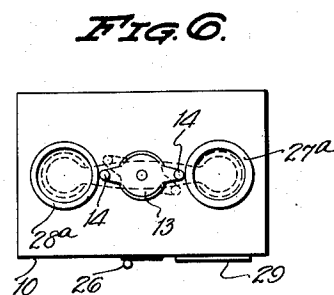
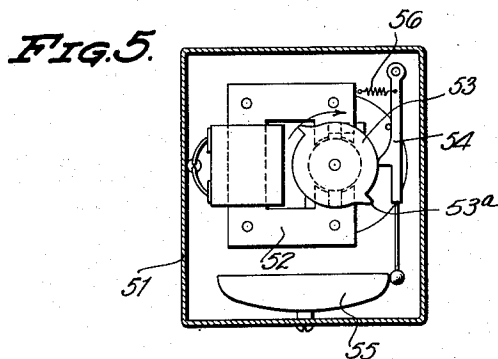
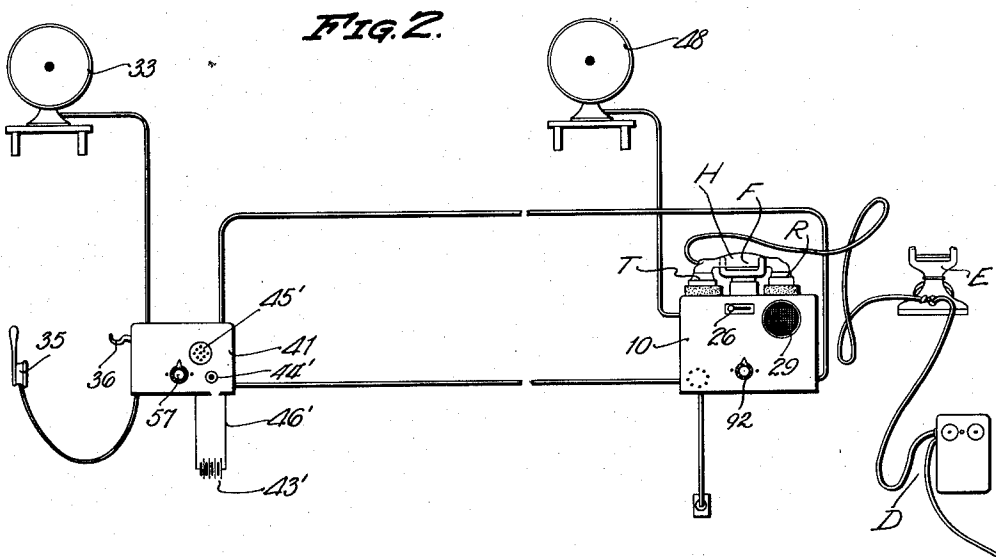
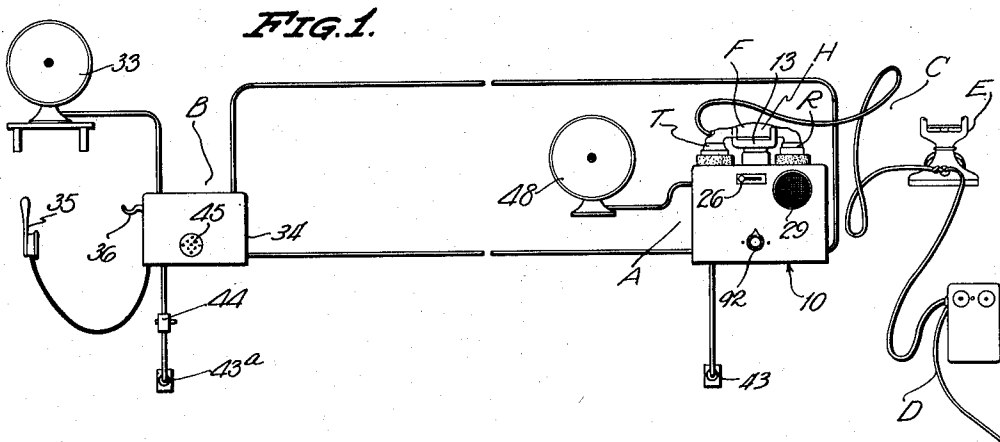
R. VARLEY

2,071,053

INTER-OUTER TELEPHONE SYSTEM

Filed July 5, 1934

3 Sheets-Sheet 1



INVENTOR

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WITNESS:

Edw. J. Lusk

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2,071,053

INTER-OUTER TELEPHONE SYSTEM

Filed July 5, 1934

3 Sheets-Sheet 2

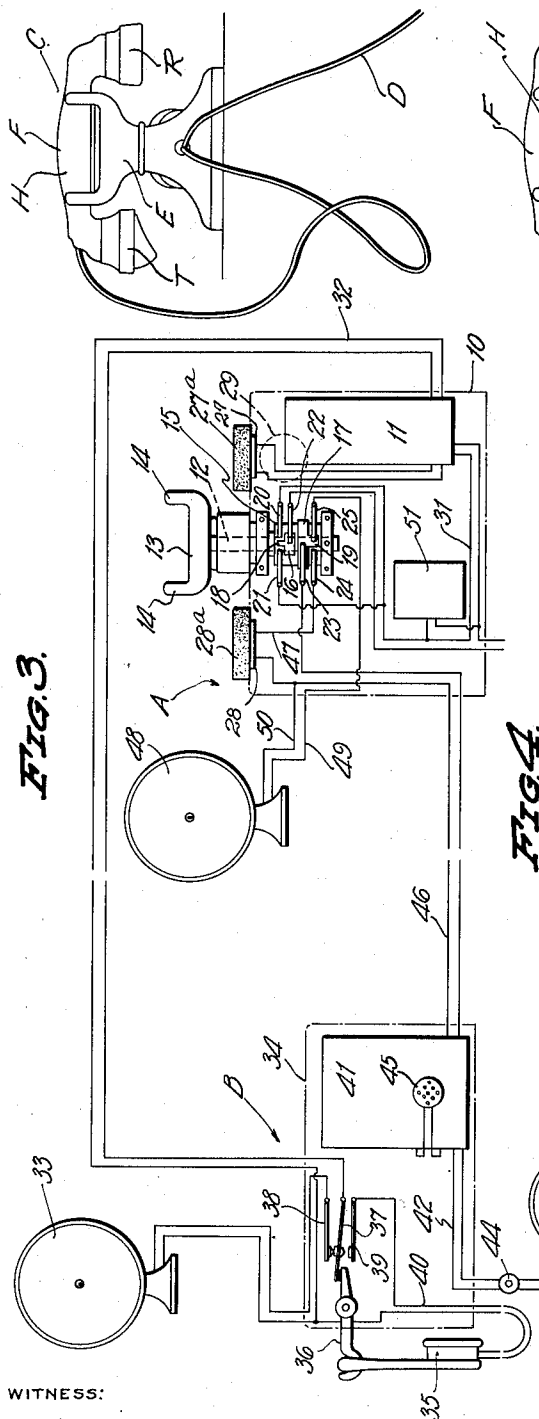


FIG. 3.

WITNESS:

S. Peyton Lusby.

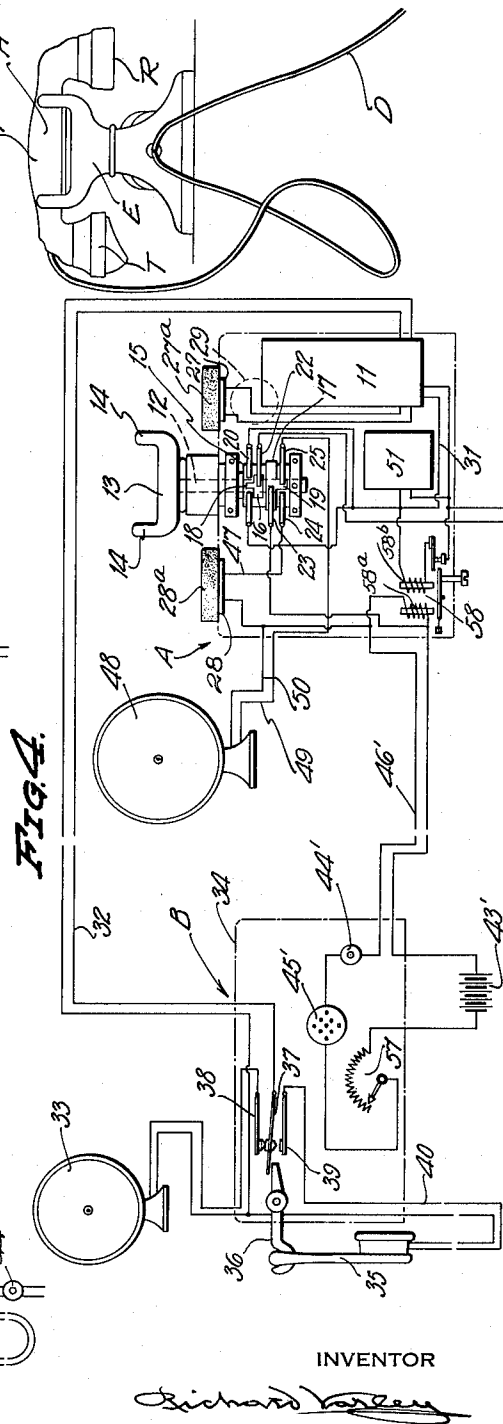


Fig:

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INTER-OUTER TELEPHONE SYSTEM

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3 Sheets-Sheet 3

FIG. 7.

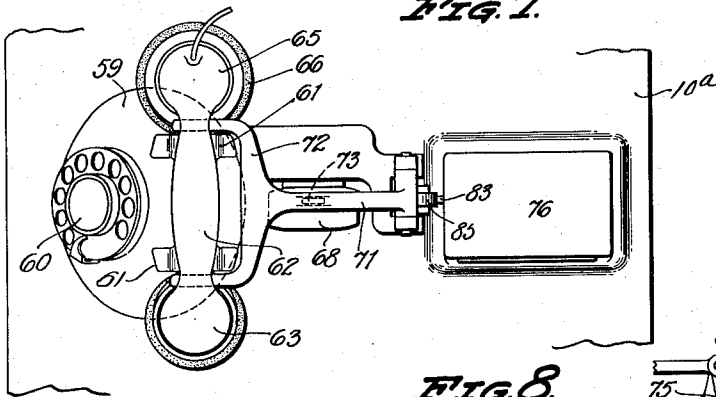


FIG. 8.

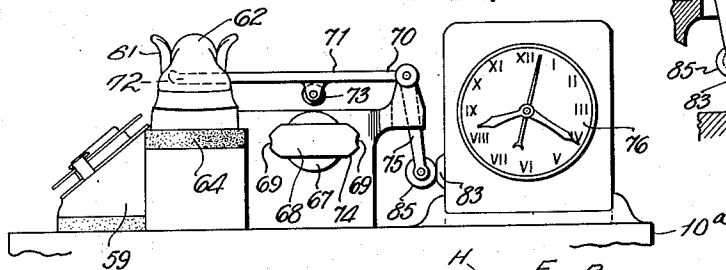


FIG. 9.

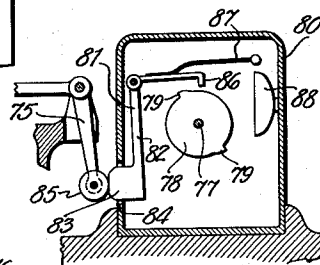


FIG. 10.

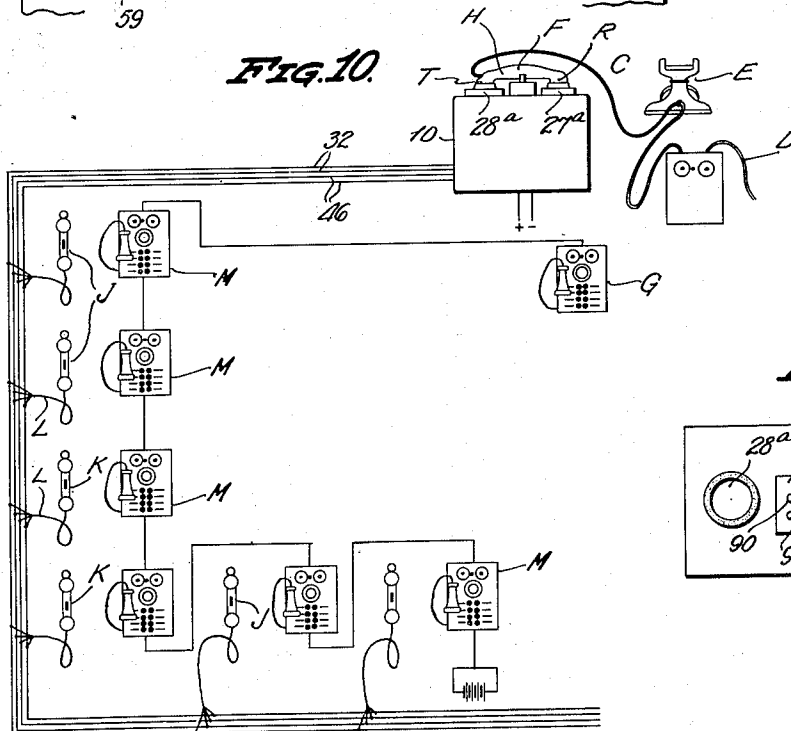
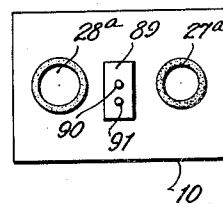


FIG. 11.



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UNITED STATES PATENT OFFICE

2,071,053

INTER-OUTER TELEPHONE SYSTEM

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Application July 5, 1934, Serial No. 733,824

41 Claims. (Cl. 179—1)

This invention relates to improvements in telephone systems, and more particularly to an inter-outer telephone system.

One of the objects of the invention resides in acoustically coupling the transmitter of a hand set phone of a public, battery telephone system with a receiver of a one-way or a two-way private battery telephone circuit and simultaneously acoustically coupling the receiver of the same hand-set phone with a microphone or a transmitter of another one-way private telephone circuit which includes one or more electronic amplifiers, without disturbing the leased property of the public telephone system.

Another feature of the invention is to fully utilize the economic advantages of electronic amplifiers in the pick up and transmission of sound from the receiver, and transmitter of a public telephone instrument, thereby broadening the use of the regular telephone system. It provides a service for the regular system not now inherent therein, in that direct telephonic communication may be so amplified in transmission to and from the telephone instruments that not only is it possible to converse between stations without holding the receiver-transmitter instrument to the ear and mouth, but unrestricted conversation between groups or among several people at one station may be carried on with one or more persons at another station or stations without the necessity of using individual telephone instruments. Further, it is possible to link in (non-electrically) auxiliary telephones or systems such as inter-phones, not part of the regular telephone system, with the full range of service available in the regular system.

The majority of subscribers of telephone systems are now the users of the hand-set type of telephone instrument commonly known as the "French" type, and the use of this particular type of phone lends added advantage to my system, as it facilitates the handling of the same to and from its normal supporting stand, and also enables the efficient acoustical connection of the public telephone system with a private telephone system, while the fixed spaced relation of the transmitter and receiver prevents feed-back.

Other features of the invention will be apparent as the following specification is read in conjunction with the accompanying drawings, in which:

Figure 1 is a diagrammatic view of one form of my telephone system.

Figure 2 is a view similar to Figure 1, but showing a slight modification.

Figure 3 is a wiring diagram of the system shown in Figure 1.

Figure 4 is a wiring diagram of the form of the invention shown in Figure 2.

Figure 5 is a vertical sectional view of the intermittently operated signal bell.

Figure 6 is a top plan view of the electronic amplifier at the office station showing the phone rest in normal position in full lines, and in operative position in dotted lines.

Figure 7 is a top plan view of a modified switch control device.

Figure 8 is a side elevational view of the device shown in Figure 7.

Figure 9 is a detail vertical sectional view through the electric signalling device.

Figure 10 is a diagrammatic view showing my inter-outeroftice telephone system associated with a standard installed inter-office system.

Figure 11 is a top plan view of the electronic amplifier and phone rest used in the system shown in Figure 10.

Referring to the drawings by reference characters, the letter A designates an office station outfit and B an extension station thereof, while C designates a public telephone subscriber's receiving and transmitting appliance of the "French" type which is arranged in a two-way battery telephone system, a lead from which is shown at D. The telephone appliance C includes the usual cradle stand E and the hand receiving and transmitting instrument F provided with a hand grip H, an ear receiver R at one end of the hand grip, and a mouth transmitter T at the opposite end.

Constituting part of the office station A is a box-like casing 10 which houses an adjustable electronic sound amplifier 11 of the conventional construction employing vacuum tubes of the amplifying and rectifying type, choke coils, transformers, condensers, and all other elements which are commonly used in the construction of such devices. For example, an amplifier such as RCA Victor portable sound amplifier, type PG-63, and Universal amplifier assembly (6 watt) may be used. Other types of announcing outfits may be used in the system about to be described but it is not believed necessary to specifically describe the same, hence I have illustrated the electronic sound amplifier diagrammatically, furthermore I do not require more than two stages of amplification.

Referring particularly to Fig. 3 of the drawings, rotatably mounted in the casing or cabinet 10 is a vertical shaft 12, the upper end of which

extends through the top of the casing and carries a phone instrument rest 13 which includes a pair of diametrically spaced upstanding fingers 14-14 (Figs. 3 and 6). The inner end of the shaft 12 carries a sleeve 15 of di-electric material on which is mounted arcuate contacts 16 and 17 having vertical extension portions 18 and 19 respectively. Fixedly supported adjacent the contact 16 in the path of turning movement of the extension portion 18 thereof are fixed spring contacts 20 and 21, while disposed in electrical engagement with the contact 16 proper is a fixed spring contact 22. A fixed spring contact 23 is in constant engagement with the contact 17 while spaced opposite spring contacts 24 and 25 are fixedly disposed in the path of the extension portion 19 of the said contact 17. The phone instrument support constitutes a switch for the selective opening and closing of the several electric circuits hereinafter described and is manipulated by the actuation of a handle or knob 26 (Fig. 1) fixed to the shaft 12 and extending through a slot in the front wall of the casing 10.

Mounted in the top wall of the casing 10 at one side of the phone rest 13 is a microphone 27 while mounted diametrically opposite the microphone 27 is a receiver or sound reproducer 28. The microphone and receiver are provided with annular receptacles 27^a and 28^a of insulating material which are so spaced that the ear piece or receiver R and the mouthpiece or transmitter T of the hand-set phone instrument F may rest therein and overlie the microphone 27 and receiver 28 respectively when the instrument F is in a position upon the rest 13 and the rest has been turned to the desired selective position to effect an acoustical connection therebetween. A grill opening 29 (Fig. 1) is provided in the front wall of the casing adjacent the microphone 27 and is within the range of sound spoken into the opening. It being understood that the receiver R, receives the messages coming in over the wires of the public telephone company and transmits sound messages to the microphone of the announcing outfit which includes one or more electronic amplifiers and which comprises a one-way private telephone circuit, the speaker of which is located at any distant place.

The electronic amplifier 11 receives its current from a source of A. C. and is shown connected to an outlet wall socket 43, a portion of the power circuit being shown at 31 (Fig. 3) and in which the fixed contacts 20, 21, and 22 are arranged. In Figure 3 of the drawings, the phone rest 13 is shown in a neutral position but it will be apparent that a turning movement of the same in either direction will cause the power circuit 31 to be closed through one or the other of spring contacts 20 and 21 to pass current to the electronic amplifier 11.

The microphone 27 is arranged in a two-wire, one-way operatively independent receiving circuit 32 which is operatively coupled up with the electronic amplifier 11, and also arranged in said circuit is a loud speaker 33 at the extension station B.

The amplifier 11 includes a volume control rheostat knob 92 as shown in Figures 1 and 2 for manual operation by an operator at the office station to regulate the intensity of the amplifier and control the volume of sound produced by the receiver or loud speaker at the extension station B.

Also located at the extension station B is a cabinet or casing 34 with which an ear phone 35

is associated. Normally, the ear phone 35 is hung upon a pivoted hook end of a lever 36 which extends from one end of the casing, the other end of the lever extending within the casing and acting as a switch actuating member for a spring switch member 37 which is arranged in the circuit 32. Normally the lever 36 holds the spring contact member 37 in engagement with a fixed contact 38 also arranged in the circuit 32. In order that electrical waves transmitted through the circuit 32 may be received at the extension station through the ear phone 35 instead of the speaker 33, there is provided a fixed contact 39 in the path of movement of the spring contact 37 upon its release by the lever 36, and the same is arranged in a branch circuit 40 of the circuit 32. The ear phone 35 is arranged in the branch circuit 40 whereby removal of the ear phone from the hook lever 36, will cause the breaking of the circuit 32 through the loud speaker 33 by reason of the release of the spring contact member 37, and the engagement of contact 37 with contact 39 whereupon the electrical waves through the circuit 32 may be received as audible speech upon the ear phone 35.

For the transmission of sound or speech from the extension station B to the office station A, or to the transmitter T of the instrument F when placed upon the rest 13, I employ within the casing 34 an adjustable electronic amplifier 41 which is similar to the amplifier 11 hereinbefore described. The electronic amplifier 41 receives its current through a power circuit 42 from a source of supply such as a wall socket 43^a, and which is controlled by a manual switch 44 arranged in the circuit 42. Operatively connected with the electronic amplifier 41 is a microphone or transmitter 45 which is arranged in a two-wire one-way operatively independent transmission circuit 46 and is operatively associated with the amplifier 41 when the power circuit 42 is closed. One wire of the circuit 46 leads to the spring contact 23 while the other wire thereof leads direct to the receiver 28. The contact 24 is also arranged in the circuit 46 and is connected to the receiver by a wire 47. Thus it will be seen that by turning on the switch 44, the circuit 46 is rendered operative to transmit electrical waves, responsive to speech thereover.

Under normal conditions when the interoffice system is not in use, the switch associated with the rest 13 occupies a neutral position in which the stationary spring contacts 23 and 25 are in engagement with the parts 17 and 19 respectively of the rotatable contact. By reason thereof, the speaker 48 is connected into the transmitting circuit 46 through the wires 49 and 50. Thus the party at the extension station, by closing the power switch 44, may speak to the operator at the main station through the speaker 48.

By providing a receiving circuit and a transmitting circuit which are operatively independent of each other, it is possible to employ a different source of energy in each circuit and individually control the intensity of the energy in the respective circuits to suit operating conditions. Also, the complete isolation of the circuits and the instruments arranged therein avoids possibility of feed back in the circuits. Feed back is also avoided by the use of the French phone instrument in which the receiver and transmitter are fixed relative to each other thus preventing direct impingement of sound from the receiver on the diaphragm of the transmitter.

Assume that a call is received at the office station A over the public telephone system, and it is desired to acoustically couple up the French phone F with the interoffice system to permit a person at the extension station B to receive the message and converse with the party calling through the public telephone system. The operator at the office station A lifts the instrument F from the cradle E and before placing the instrument F upon the cradle 13 to acoustically couple the instrument with the inter-office system, the operator at the station A communicates with the party at the station B. This may be accomplished by the operator at the office station A by actuating the handle 26 of the main control switch to the right to cause the closing of the power circuit 31 through the fixed contacts 20 and 22 and the movable unitary contact 16—18, whereupon the amplifier 11 is energized and the receiving circuit 32 is rendered operative. During movement of the phone rest 13 to the right to close the circuit 31, the movable contact 19 has been moved but maintains its engagement with the contact 25, thus maintaining the transmission circuit 46 for operation through the loud speaker 48.

The operator at the office station speaks through the microphone 27 and by means of the loud speaker 33, is able to call the proper party to the receiver at the extension station B. The party at the station B proceeds to close the switch 44, thus closing the power circuit 42 to the amplifier 41 whereby the transmission circuit 46 is rendered operable. The party at station B may now speak through the microphone 45 and the speech will be transmitted as electrical waves through the circuit 46 to the loud speaker 48, whereby the operator at station A may be notified that the required party is ready at station B to receive the message from the phone of the public telephone system. Having thus established two-way communication between the operator's station and the extension station, the operator is ready to effect the acoustical coupling between the inter-office system and the public telephone system. However, before doing so, it is necessary to move the phone rest 13 and associated switch into its extreme opposite operating position, so as to render the receiver operative and eliminate the loud speaker 48 from the circuit.

By reference to Figure 6 of the drawings, it will be seen that normally, the pins 14—14 of the instrument rest 13 are in alinement with the microphone 27 and receiver 28, whereupon they prevent the placing of the French phone in position to aline the mouthpiece T with the microphone 27 and the ear piece R with the receiver 28. Thus the main control switch must be rotated from neutral position to move the pins 14—14 to a position out of alinement with the microphone 27 and the receiver 28, such as the dotted line position shown in Figure 6, and at which time the control switch is in an "on" position for acoustical coupling with the public telephone instrument.

After having called the party at station B intended to receive the message, the actuating lever 26 and associated switch is moved to the left through the neutral position and into its other operating position, as shown in Fig. 6, to cause the contact 24 to engage the extension contact 19, and the spring contact 25 to disengage contact 19, so that the transmission circuit 46 in-

cludes the receiver 28 instead of the loud speaker 48.

The operator then places the public telephone instrument F in position upon the rest 13, as indicated in Fig. 6, whereby the acoustical coupling between the interoffice and the public telephone systems is established. Of course, the position of the receiver R and transmitter T in the pocketed annular receptacles 27^a and 28^a, prevents the switch from being again rotated until the telephone instrument F has been removed and the acoustical coupling broken.

When an acoustical coupling has been made between the instrument F and the microphone 27 and receiver 28, the sound from the receiver R is picked up by the microphone 27 and the electrical waves thus set up are amplified by the electronic amplifier 11, whereupon they pass through the circuit 32 to the loud speaker 33.

In the event that the party receiving the message at the extension station B prefers to use the ear phone 35, the same may be removed from the hook 36, thus disconnecting the circuit 32 through the loud speaker 33 and coupling up the branch circuit 40 through the contact members 37 and 39 with the receiving circuit 32. The party at station B may talk into the microphone 45 and the electrical waves set up by the voice are amplified by the electronic amplifier 41 from which they pass through the circuit 46 to the transmitting instrument or reproducer 28 over which the mouthpiece of the phone F is positioned. After the party at the extension station B has completed his conversation, the switch 44 is turned off.

In order that the operator at the office station A may be warned that the main switch through the power circuit 31 is still "on", I provide an audible signalling device 51 which is arranged in the circuit 31 and is operated whenever the switch is in an operating position. The working mechanism of the signalling device 51 is quite similar to the mechanism used in A. C. operated clocks and includes a self starting induction motor 52 (Fig. 5) preferably of the synchronous type and which is arranged in parallel with the two wires of the power circuit 31. The motor 52 operates a cam 53 which intermittently operates a pivoted hammer 54, the cam teeth 53^a tending to move the hammer away from a bell 55 while a spring 56 returns the hammer 54 into striking contact with the bell 55. By varying the cam teeth 53^a of the cam 53, the bell may be operated once a minute, every half minute or other various time intervals.

After the party at the extension station B has completed his conversation with the outside telephone system, the operator at station A, by listening at the receiver 28, may learn that the conversation has ceased and then lifts the instrument F from the rest 13, and replaces it upon the cradle stand E after which the manipulating handle 26 is moved to actuate the rest 13 and associated switch to neutral position to open the power circuit 31. This not only renders the amplifier 11 inoperative, but leaves the speaker 48 connected into circuit, and therefore in readiness for another call from the extension station.

As previously mentioned, inter-office communication is carried on between stations A and B, with the switch in its right hand position, before acoustically coupling the telephone instrument F with the inter-office system with the switch in its left hand position when a call is to be trans-

ferred to a party at station B, but such inter-office communication may be carried on at any time by the operation of the central switch 26 into its right hand position, in the manner hereinbefore mentioned.

In Figures 2 and 4 of the drawings, I have illustrated a slight modification of my invention wherein the various circuits and parts are the same as that shown in Figures 1 and 3 with the exception of the transmission circuit from the extension station B to the receivers at station A.

The transmission circuit from station B to station A is designated by 46' and includes a microphone 45' mounted in the cabinet 34. Instead of receiving its current from the source shown in Figures 1 and 3, the transmission circuit 46' includes a battery 43' and a rheostat 57 for varying the resistance in the circuit and correspondingly varying the intensity of the electrical waves transmitted through the circuit, or, the transmission circuit 46' may include a dry rectifier of the copper-oxide type now in common use for low voltage devices. A push button switch 44' is also arranged in the circuit and both the switch and control knob of the rheostat 57 are disposed exteriorly of the cabinet 34 within reach of the user of the head phone 35. Thus it will be seen that after the party at station B has been called to the receiver at said station he proceeds to press the push button switch 44' to close the circuit 46' and continues to hold the switch on until the end of the conversation. Of course, other types of switches may be used. The intensity of the electrical waves over the circuit 46' may be selectively controlled by the adjustment of the rheostat 57 and the sound reproduced by the loud speaker 33 and receiver 35 arranged in the amplifier circuit controlled by the rheostat knob 92 of the amplifier 11.

In order that the operator at the office station A may be notified as to when the circuit 46' is rendered inoperative or open by the release of the push button switch 44' at the end of the conversation, and at which time the telephone instrument F should be lifted from the rest 13 and returned to its cradle stand E, I provide an electric buzzer 58 arranged within the cabinet 10 at the office station A. One of the coils 58^a of the electro-magnet of the buzzer is arranged in the battery operated transmission circuit 46' while the other coil 58^b thereof is in parallel with the power circuit 31. When the transmission circuit is closed and in operation, the electro-magnet 58^a is energized by the battery 43' and the buzzer armature is held against vibratory movements, irrespective of whether the electro-magnet 58^b is energized from the main source of A. C. power. With the circuit connected to the power line only, the buzzer will operate and constitutes an audible signal to the operator at the office station A that the party at station B has released the push button switch 44' which is the equivalent of having hung up. Then to stop the operation of the buzzer, the power switch must be turned by the operator to its neutral position which is done as soon as the French phone is lifted from its rest 13'. Obviously the French phone will then be replaced in its cradle of the public telephone system.

In Figures 7, 8 and 9 I have illustrated a modification which may be used, more particularly in association with the transmission and receiving circuits of my inter-office system hereinafter described in connection with Fig. 10, and the same consists of a combined phone rest, acoustical

coupling and audible signalling device. The electronic amplifier cabinet is shown at 10^a while mounted on the top thereof is a telephone base 59 containing the usual dial mechanism embodied in a French style telephone. It is also provided with the usual cradle 61 upon which the French type instrument 62 rests. When at rest upon the cradle, the ear piece or receiver 63 overlies a microphone associated with a receptacle 64 mounted in the coupling device and operatively connected to the circuit 32, whereas the mouth-piece or transmitter 65 overlies a receiver or sound reproducer provided with a receptacle 66.

Mounted horizontally on the cabinet 10^a is a turnable snap switch 67 having a manipulating flat knob 68 provided with concavities 69 in opposite ends. The switch 67 is conventional in construction and is provided with an "on" or closed position and an "off" or open position and takes the place of the main control switch which is operable by the phone rest 13 of Figure 1, and a detailed description of the same is not believed necessary. By turning the knob 68 of a clockwise turning switch, a quarter turn, to the right from its normal "off" position as shown, the switch is merely brought into position to connect the amplifier to the source of power. The knob 68 of this clock-wise turning switch is so made as to prevent it from being turned to the left, in accordance with well known practice.

For the purpose of lifting the telephone instrument 62 a sufficient distance to effect an acoustical coupling between the phone 62 and the inside system, I pivot a bell crank lever 70 at the rear of the top of the switch cabinet. The free end of the horizontal arm 71 of the bell crank terminates in a fork 72 which underlies the phone 62 beyond opposite ends of the cradle 61. A roller 73 is journaled in bearings extending from the underside of the arm 71 and is normally disposed in axial alinement with the switch 67 and in the path of movement of the concave ends of the knob 68. When the knob is turned a quarter turn to the right, the roller rides over the curved surfaces 74 and seats in a concavity 69, thus lifting the arm 71 upwardly, which raises the phone 62 off its cradle 61. This upward movement of the arm 71 causes the shorter downwardly extending arm 75 to move inwardly for a purpose now to be explained.

Mounted upon the top of the cabinet 10^a at the rear of the switch cabinet is an electric clock 76. The shaft of the clock motor, which constitutes the second hand shaft, is designated 77 and mounted thereon is a cam 78 having any desired number of cam teeth 79 extending radially therefrom, two of which have been shown at diametrically opposite points. Pivotaly mounted within the clock casing 80 is a bell crank lever 81, one arm 82 of which depends downwardly and terminates in an angular head 83 which extends through an opening 84 in the casing 80 and is disposed in the path of a roller 85 mounted on the free end of the arm 75 of the bell crank 70. The other arm of the bell crank 81 terminates in a downwardly extending finger 86 which is normally out of the path of the cam teeth 79 by reason of the bearing engagement of the roller 85 with the head 83 of the arm 82 which is held inwardly at an angle to the vertical as shown in Figure 8. However, when the roller 85 moves away from the head 83, the arm 82 drops to a vertical position by gravity and the finger 86 moves into the path of the cam teeth 79. A spring bell clapper 87 is mounted

on top of the horizontal arm of the bell crank 81 and upon each engagement and release of the finger 86 by the cam teeth 79, the clapper will strike a bell 88 mounted within the casing 80.

If the shaft 77 makes one revolution each minute, the bell 88 will be struck every half minute.

When the telephone conversation has been terminated, the operator turns the snap switch knob 68 another quarter turn to the right, whereby the energizing circuit of the amplifier is open-circuited and the power is cut off of the amplifier.

By this construction, an acoustical connection between a subscriber's public telephone and an inter-office system may be effected without touching the telephone instrument, other than at the time of first receiving an incoming call. Obviously, if upon picking up the telephone instrument in answer to an outside call, it is learned that some party at one of the branch stations is wanted, the switch knob 68 is turned by the operator to mechanically raise the supporting forks 72 and also to energize the amplifier, before the instrument is replaced upon the supporting fork 72 in acoustical relation to the interoffice system. The actuation of the switch knob 68 controls the lifting of the telephone instrument from its cradle and its replacement thereon, and also controls the operation of the audible signal just described.

In Figure 10 I have illustrated my system of telephone communication in association with one of the present type inter-office communication systems which includes a main office phone G operatively connected with similar outer office extension phones M, whereby inter-office conversation may be carried on between the main phone G and any of the extension phones M, or between any of the extension phones M. This type of system provides push button call means for calling any selected station, and permits of selective talking.

Located at the main office is the acoustical coupling and electronic amplifier outfit 10 hereinbefore described together with the public telephone equipment C. The receiving circuit 32 and transmission circuit 46 are the same as hereinbefore described but the receiving and transmitting instruments at the extension stations, as shown in Figures 1 to 4, are dispensed with, and in their stead is a series of French type phones J, respectively provided at the extension phone stations M. These phones J are of the type in which each is provided with a push switch button K in the handle portion and may be hung upon a hook. The cord L containing four wires connects the ear piece and the mouthpiece of the phone with the set of wires 32 and 46 whereby grasping of the phone J and depressing the switch K will operatively connect the said phone in the circuits 32 and 46. Thus a person at the extension stations may converse through the circuits 32 and 46 with a party calling from the public telephone system through the telephone equipment C, the phone F thereof being acoustically coupled with the microphone and sound reproducer located beneath the receptacles 27^a and 28^a respectively. By the arrangement just described, the operator at the main office station G may receive a call through the phone F and transfer the same to a party at any of the extension stations M. The party at the extension station is called to any of the phones by the operator at the main station ringing the desired phone M and calling the proper party to the phone and advising him of the call, or a code signal may be used, that

is any particular number of rings on a phone M is an indication to answer the phone J at that particular station.

In the apparatus shown in Figs. 10 and 11, I have illustrated a double push button switch 89 of a well known type which is mounted in the top of the cabinet of the electronic amplifier 10. The switch 89 includes an "on" push button 90 which is in alignment with the microphone and sound reproducer receptacles 27^a and 28^a so as to be depressed by the handle of the phone when placed in position to effect an acoustical connection. A push button 91 constitutes the "off" button and is manually pushed by the main office operator only after the acoustical coupling has been broken to shut off the inter-office system. The switch 89 is connected in the amplifier power circuit and has an "on" and an "off" position. It takes the place of the main control switch shown in Figures 1 to 4 which is operated by the turning of the phone rest 13.

The modification shown and described in connection with Figs. 7, 8, and 9 is particularly adapted for use in the system of Fig. 10, in which it is intended to be used in the place of the public telephone set E-F and the acoustical coupling and amplifier outfit 10.

Throughout the specification and claims the term "receiving circuit" is employed to denote the inter-office telephone circuit through which the party at a branch station receives the messages emanating from the receiver of the public telephone instrument which are picked up acoustically by the transmitter or microphone of the inter-office system at the operator's station and are relayed to the receiver or reproducer of the branch station.

The terms "transmitting circuit" or "transmission circuit" are used to designate the interoffice telephone circuit through which the party at the branch station speaks and by means of which his messages delivered into the transmitter or microphone at the branch station are transmitted to the receiver or reproducer at the operator's station from which they are picked up acoustically by the transmitter of the public telephone instrument and thence are delivered over the public telephone system to the desired party.

While I have shown and described several embodiments of my invention, I wish it to be understood that various other arrangements and constructions may be resorted to if desired without in any way departing from the spirit of my invention, and I do not restrict myself to anything less than the scope of the appended claims.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. In a system of telephonic communication, the combination of a public telephone system having a subscriber's receiving and transmitting instrument, and an electrically independent inter-office system including two operatively independent two-wire one-way telephone circuits acoustically coupled with said receiving and transmitting instrument for receiving and transmitting telephone messages from and to said public telephone system, one of the two-wire one-way telephone circuits including an electronic amplifier.

2. In combination with the telephone receiving and transmitting instrument of a subscriber's public telephone, an inter-office telephone system including a main office station and an extension station, a microphone and a sound reproducer

located at said main office station, a sound reproducer and microphone located at said extension station, a two wire receiving circuit connecting said first mentioned microphone with said last mentioned sound reproducer, an electronic amplifier arranged in said two-wire circuit, a two wire transmission circuit operatively independent of said receiving circuit and in which the microphone at the extension station and the sound reproducer at said main office station are arranged, switch means for controlling each of said circuits and located at the respective stations, and means for acoustically coupling said telephone instrument with the microphone and sound reproducer at said main office station.

3. In combination with the telephone receiving and transmitting instrument of a subscriber's public telephone, an inter-office telephone system including a main office station and an extension station, a microphone and a sound reproducer located at said main office station, a sound reproducer and microphone located at said extension station, a two wire receiving circuit connecting said first mentioned microphone with said last mentioned sound reproducer, a two wire transmission circuit operatively independent of said receiving circuit and in which the microphone at the extension station and the sound reproducer at said main office station are arranged, switch means for controlling each of said circuits and located at the respective stations, signal means located at the main office station operable upon the closing of said receiving circuit by the turning on of its switch means to indicate to the operator at the subscriber's main station that the switch in the receiving circuit is at the "on" position, and means for acoustically coupling said telephone instrument with the microphone and sound reproducer at said main office station.

4. In combination with the telephone receiving and transmitting instrument of a subscriber's public telephone, an inter-office telephone system including a main office station and an extension station, a microphone and a sound reproducer located at said main station, a sound reproducer and microphone located at said extension station, a two wire receiving circuit connecting said first mentioned microphone with said last mentioned sound reproducer, a two-wire transmission circuit operatively independent of said receiving circuit and in which the microphone at the extension station and the sound reproducer at said main office station are arranged, switch means for controlling each of said circuits and located at the respective stations, signal means located at said main office station and normally inoperative but operable upon the "on" position of the switch means in said receiving circuit and inoperative upon the closing of the switch means of said transmission circuit whereby the operator at the main station may be notified as to when said transmission circuit is open or closed.

5. In combination, an inter-office telephone system having a main office station, a public telephone instrument of the French type located at said main office station, said inter-office telephone system including a receiving circuit, a transmitting circuit operatively independent of said receiving circuit, a microphone and a sound reproducer in said receiving and transmitting circuits respectively and located at said main office station and in fixed spaced relation, and means

for receiving the handle of and supporting said French type phone instrument with its receiver adjacent said microphone and its transmitter adjacent said sound reproducer to effect an acoustical connection between said French phone instrument and said inter-office telephone system.

6. A system of telephonic communication comprising in combination, a French type telephone instrument of a public telephone system wherein the transmitter and receiver are respectively disposed at opposite ends of a hand grip member, an interphone system including two operatively independent two-wire one-way circuits, an electrically operated announcing outfit arranged in one of said two-wire one-way circuits, said announcing outfit having one or more electronic amplifier tubes and a microphone, a sound reproducer arranged in the other of said two two-wire one-way circuits and disposed adjacent said microphone, and means for supporting said telephone instrument with its receiver and transmitter in intimate relation to the sound reproducer and microphone respectively to provide an acoustical coupling therebetween.

7. A system of telephonic communication comprising in combination, a French type telephone instrument of a public telephone system wherein the transmitter and receiver are respectively disposed at opposite ends of a hand grip member, an interphone system including a receiving two-wire one-way circuit and an operatively independent transmitting two-wire one-way circuit, an electrically operated announcing outfit arranged in each of the two-wire one-way circuits, each announcing outfit having one or more electronic amplifier tubes, and a microphone, a sound reproducer arranged in each of the two-wire one-way circuits, the sound reproducer in said transmitting circuit and the microphone in said receiving circuit being arranged adjacent each other, and means for supporting said telephone instrument with its receiver adjacent the microphone of said receiving circuit and its transmitter adjacent the reproducer of said transmitting circuit to effect an acoustical coupling therebetween.

8. In combination, a public telephone system having a subscriber's receiving and transmitting telephone instrument, an electrically independent interoffice transmitting and receiving telephone system, switch means for rendering said interoffice telephone system operative and inoperative, signal means arranged in said interoffice telephone system and operable when the switch means is in "on" position, and means for acoustically coupling said subscriber's receiving and transmitting instrument with said interoffice telephone system when said switch means is in "on" position and for preventing operation of said switch means to "off" position until such time as the acoustical connection is broken.

9. In combination, a public telephone system having a subscriber's receiving and transmitting telephone instrument, an electrically independent interoffice telephone system including independently operable receiving and transmitting circuits, means for acoustically coupling the receiver and transmitter of the telephone instrument with the receiving and transmitting circuit respectively of said interoffice system, manually operable means for increasing the intensity of the electric waves in said receiving and transmitting circuits at the sound receiving ends thereof, and means for preventing feed back from

said independent telephone system to said public system.

10. In combination, a public telephone system having a subscriber's receiving and transmitting telephone instrument, an electrically independent interoffice telephone system including a transmitting circuit and a receiving circuit, means for acoustically coupling said interoffice system with said telephone instrument, electronic amplifying means in said receiving circuit for increasing the intensity of the electric waves passing through said receiving circuit, a loud speaker and a hand type receiver arranged to be connected in said receiving circuit, and switch means arranged in said receiving circuit for selectively opening and closing the receiving circuit to either said loud speaker or hand type receiver.

11. In combination, a public telephone system having a subscriber's receiving and transmitting telephone instrument, an electrically independent interoffice telephone system including a two-wire, one-way receiving circuit and a two-wire, one-way transmitting circuit operatively independent of said receiving circuit, a main office station at which the subscriber's telephone is located and one or more extension stations, electronic amplifying means arranged in said receiving circuit, one or more telephone instruments at the extension station or stations operatively connected to the two, two-wire, one-way circuits, and means located at the main office station for acoustically coupling the subscriber's telephone instrument with the receiving and transmitting circuits.

12. In combination with the French hand type telephone instrument of a public telephone system, an interoffice telephone system, switch means for rendering said interoffice telephone system operative and inoperative, means for acoustically coupling said telephone instrument with said interoffice telephone system, and means for preventing operation of said switch means to inoperative position when said telephone instrument is acoustically connected with said interoffice telephone system.

13. In combination with the French hand type telephone instrument of a public telephone system, an interoffice telephone system, switch means for rendering said interoffice telephone system operative and inoperative, means for acoustically coupling said telephone instrument with said interoffice telephone system, means preventing operation of said switch means to inoperative position when said telephone instrument is acoustically connected with said interoffice telephone system, and audible signal means located adjacent said telephone instrument and arranged in said interoffice telephone system and operable only when said interoffice system is in operation.

14. In combination with a French type telephone instrument and a cradle supporting stand therefor, an interoffice telephone system including a receiver and a transmitter within the range of said telephone instrument when manually lifted free of and from its position of rest upon said cradle stand, switch means for rendering said interoffice telephone system operative and inoperative, means apart from said cradle supporting stand and mechanically associated with said switch means for supporting said telephone instrument in acoustical relation with said receiver and transmitter after the same has been lifted free of and away from its position of rest on said

cradle stand and when said switch means is in operative position.

15. In combination with a French type telephone instrument and a cradle supporting stand therefor, an interoffice telephone system including a receiver and a transmitter within the range of said telephone instrument when lifted from its position of rest upon said cradle stand, switch means for rendering said interoffice telephone system operative and inoperative, means for supporting said telephone instrument in acoustical relation with said receiver and transmitter after the same has been lifted from its position of rest on said cradle stand and when said switch means is in operative position, and audible signal means in said interoffice system operable when said switch means is in operative position.

16. An interoffice telephone system for use in association with the French type telephone instrument of a public telephone system including a two-wire one-way receiving circuit, a two-wire one-way transmitting circuit operatively independent of said receiving circuit, an electronic amplifier arranged in said receiving circuit, and means for acoustically connecting said receiving circuit and said transmitting circuit with a French type telephone instrument.

17. A system of telephonic communication comprising in combination a public system station having a receiver and a transmitter, an interoffice telephone system including a local station having a receiver and transmitter respectively connected into independently operable transmitting and receiving circuits of said interoffice system, means for acoustically coupling said public receiver with said local transmitter and said local receiver with said public transmitter, and means for preventing feed back from said local station into the public system.

18. In combination, a public telephone system having a subscriber's receiving and transmitting telephone instrument, an inter-office system including a receiving telephone circuit, a transmitting telephone circuit, means for acoustically coupling said subscriber's receiving and transmitting telephone instrument with the receiving and transmitting circuits, switch means located adjacent the subscriber's telephone instrument and operable for rendering said receiving circuit operative upon the effecting of an acoustical connection, and for rendering said receiving circuit inoperative upon the breaking of an acoustical connection, and signal means located adjacent said telephone instrument and arranged in said receiving circuit and operable when said switch means is in operative position.

19. In combination, a public telephone system having a subscriber's receiving and transmitting telephone instrument, an electrically independent inter-office telephone system including a transmitting circuit, a receiving circuit operatively independent of said transmitting circuit, each of the circuits having a source of electrical energy different from the other, means for acoustically coupling the subscriber's telephone instrument with said transmitting and receiving circuits, and manual control means arranged in the respective circuits for regulating the intensity of the electric waves passing through the respective circuits.

20. A system of telephonic communication comprising in combination a main station, a branch station, a public telephone instrument located at said main station, an inter-office telephone system including a receiver and a trans-

mitter located at said main station, a transmitter and receiver at said branch station, a receiving circuit connecting the transmitter of said main station with the receiver at said branch station, a transmitting circuit separate from and independent of said receiving circuit and connecting the receiver at said main station with the transmitter at said branch station, each of the circuits having a source of electric energy different from the other, means associated with the respective circuits for selectively regulating the intensity of the electric waves passing through the respective circuits, the said means associated with the receiving circuit being located at the main station under the manual control of the operator at said station, and means located at the main station under the control of the operator of said station for acoustically coupling the public telephone instrument with the main office receiver and transmitter of the inter-office system.

21. A system of telephonic communication comprising in combination, a main station, a branch station, a public telephone system having a telephone instrument located at said main station, an inter-office system having independently operable receiving and transmitting circuits connecting said main station and said branch station, means for acoustically coupling said public telephone instrument with said inter-office system at the main station, means for building up weak audible sounds originating in the public telephone system and received by said public telephone instrument, and means located at the main office station under the control of an operator at said main station for controlling the volume of sound built up by said last mentioned means.

22. In combination, an inter-office telephone system having a main office station, a public telephone having a phone instrument of the French type located at said main office station and a cradle stand therefor, said inter-office telephone system including a microphone and a sound reproducer at said main office station and disposed in fixed spaced relation, and means separate of and away from said cradle stand for receiving the handle of and for supporting said French type phone instrument with its receiver adjacent said microphone and its transmitter adjacent said sound reproducer when said phone instrument is manually removed from its cradle and placed upon said supporting means by the operator to effect an acoustical connection between said French phone instrument and said inter-office telephone system.

23. An inter-office system of telephonic communication comprising in combination, a main office station, a branch office station, a fixed receiver and a fixed transmitter at the main office station, a telephone instrument at the branch office system having a receiver and a transmitter arranged in fixed spaced relation relative to each other, a pair of independently operable circuits, one of said circuits having the transmitter at the main station and the receiver at the branch station arranged therein and the other circuit having the receiver at the main station and the transmitter at the branch station arranged therein.

24. An inter-office system of telephonic communication comprising in combination, a main office station, a branch office station, a fixed receiver and a fixed transmitter at the main office station, a telephone instrument at the branch

office system having a receiver and a transmitter arranged in fixed spaced relation relative to each other, a pair of independently operable circuits, one of said circuits having the transmitter at the main station and the receiver at the branch station arranged therein and the other circuit having the receiver at the main station and the transmitter at the branch station arranged therein, and switch means arranged in both of said circuits and located in the telephone instrument at the branch station for rendering said circuits operative and inoperative by the user of said telephone instrument.

25. A system of telephonic communication comprising in combination, a public telephone system having a subscriber's telephone set including a base and removable French type telephone instrument normally supported thereon, an electrically independent interoffice system having an operator's station and a branch station interconnected by independently operable transmitting and receiving circuits respectively including a transmitter at one station and a receiver at the other station, an acoustical coupling device at the operator's station disposed adjacent to the French telephone instrument and comprising the transmitter and the receiver of the interoffice system at the operator's station disposed in fixed spaced relation corresponding to the spacing of the receiver and the transmitter of said French telephone instrument, and means for supporting said French telephone instrument in acoustical relation to the receiver and the transmitter of said coupling device when the French telephone instrument is removed by the operator from its base and placed upon said supporting means with its receiver and transmitter respectively in registry with the transmitter and the receiver of said coupling device.

26. A system of telephonic communication comprising in combination, a public telephone system having a subscriber's telephone set including a base and a removable French type telephone instrument normally supported thereon, an electrically independent interoffice system having an operator's station and a branch station interconnected by independently operable transmitting and receiving circuits respectively including a transmitter at one station and a receiver at the other station, an acoustical coupling device at the operator's station disposed adjacent to the French telephone instrument and comprising the transmitter and the receiver of the interoffice system at the operator's station disposed in fixed spaced relation corresponding to the spacing of the receiver and the transmitter of said French telephone instrument, means for supporting said French telephone instrument in acoustical relation to the receiver and the transmitter of said coupling device when the French telephone instrument is removed by the operator from its base and placed upon said supporting means with its receiver and transmitter respectively in registry with the transmitter and the receiver of said coupling device, and a switch for controlling the operation of said interoffice system disposed intermediate the transmitter and the receiver of said coupling device in such position that it must be actuated into operative position before the French telephone instrument can be placed in acoustical relation with the transmitter and the receiver of said coupling device.

27. In a coupling device for acoustically connecting a French telephone instrument of a

public telephone system with a separate and electrically independent interoffice system, the combination of a cabinet having a panel provided with a pair of openings disposed in the same
 5 fixed spaced relation as the fixedly spaced transmitter and the receiver of the French telephone instrument, another transmitter and another receiver mounted within the cabinet behind the
 10 respective spaced openings thereof, receptacles associated and in registry with said panel openings to receive the receiver and the transmitter of said French telephone instrument and support
 15 it in acoustical relation with said transmitter and said receiver of said coupling device, a control switch associated with the cabinet and switch actuating means therefor disposed intermediate
 20 said panel openings in such position as to necessitate the operation of said control switch before the French telephone instrument can be placed in operative acoustical relation with the transmitter and the receiver of said coupling device.

28. A system of telephonic communication comprising in combination, a public telephone system having a subscriber's telephone set including a base and a removable French type
 25 telephone instrument normally supported thereon, an electrically independent interoffice system having an operator's station and a branch station interconnected by independently operable transmitting and receiving circuits respectively
 30 including a transmitter at one station and a receiver at the other station, an acoustical coupling device at the operator's station disposed adjacent to the French telephone instrument and comprising the transmitter and the receiver of
 35 the interoffice system at the operator's station disposed in fixed spaced relation corresponding to the spacing of the receiver and the transmitter of said French telephone instrument, means disposed intermediate the transmitter and the receiver
 40 of the coupling device for supporting the French telephone instrument in acoustical relation to said transmitter and said receiver of the coupling device after the French type telephone instrument has been removed from its base by
 45 the operator and placed upon said supporting means and switching means operably associated with said supporting means for controlling the operation of said interoffice system.

29. A system of telephonic communication comprising in combination, a public telephone system having a subscriber's telephone set including a base and a removable French type telephone instrument normally supported thereon,
 55 an electrically independent interoffice system having an operator's station and a branch station interconnected by independently operable transmitting and receiving circuits respectively including a transmitter at one station and a receiver
 60 at the other station, an acoustical coupling device at the operator's station disposed adjacent to the French telephone instrument and comprising the transmitter and the receiver of the interoffice system at the operator's station disposed
 65 in fixed spaced relation corresponding to the spacing of the receiver and the transmitter of said French telephone instrument, means for supporting said French telephone instrument in acoustical relation to the receiver and transmitter of said coupling device when the French telephone instrument is removed by the operator
 70 from its base and placed upon said supporting means with its receiver and transmitter respectively in registry with the transmitter and the receiver of said coupling device, means disposed
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at said operator's station for controllably supplying energy to said receiving circuit, and signal means at the operator's station rendered operative whenever energy is supplied to said receiving circuit.

30. A system of telephonic communication comprising in combination, a public telephone system having a subscriber's telephone set including a base and a removable French type telephone instrument normally supported thereon,
 10 an electrically independent interoffice system having an operator's station and a branch station interconnected by independently operable transmitting and receiving circuits respectively including a transmitter at one station and a receiver
 15 at the other station, an acoustical coupling device at the operator's station disposed adjacent to the French telephone instrument and comprising the transmitter and the receiver of the interoffice system at the operator's station
 20 disposed in fixed spaced relation corresponding to the spacing of the receiver and the transmitter of said French telephone instrument, means for supporting said French telephone instrument in acoustical relation to the receiver and the transmitter of said coupling device when the French telephone instrument is removed by the operator from its base and placed upon said supporting means with its receiver and transmitter respectively in registry with the transmitter and the receiver of said coupling device,
 25 and signal means at the operator's station associated with both of the independently operable receiving and transmitting circuits and arranged and adapted to be inoperative when both the independently operable receiving and transmitting circuits are in use, but to become operative whenever the use of the transmitting circuit is discontinued while the receiving circuit is still in use.

31. A system of telephonic communication comprising in combination, a public telephone system having a subscriber's telephone set including a base and a removable French type telephone instrument normally supported thereon, an electrically independent interoffice system having an operator's station and a branch station interconnected by independently operable transmitting and receiving circuits respectively including
 45 a transmitter at one station and a receiver at the other station, an acoustical coupling device at the operator's station disposed adjacent to the French telephone instrument and comprising the transmitter and the receiver of the interoffice system at the operator's station disposed in fixed spaced relation corresponding to the spacing of the receiver and the transmitter of said French telephone instrument, means for supporting said French telephone instrument in acoustical relation to the receiver and the transmitter of said coupling device when the French telephone instrument is removed by the operator from its base and placed upon said supporting means with its receiver and transmitter respectively in registry with the transmitter and the receiver of said coupling device, a loud speaker at one of said stations and selective means at said station for rendering operable either said loud speaker or the receiver of the interoffice system at said station.

32. A system of telephonic communication comprising in combination, a public telephone system having a subscriber's telephone set including a base and a removable French type telephone instrument normally supported thereon,
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an electrically independent interoffice system having an operator's station and a branch station interconnected by independently operable transmitting and receiving circuits respectively including a transmitter at one station and a receiver at the other station, an acoustical coupling device at the operator's station disposed adjacent to the French telephone instrument and comprising the transmitter and the receiver of the interoffice system at the operator's station disposed in fixed spaced relation corresponding to the spacing of the receiver and the transmitter of said French telephone instrument, means for supporting said French telephone instrument in acoustical relation to the receiver and the transmitter of said coupling device when the French telephone instrument is removed by the operator from its base and placed upon said supporting means with its receiver and transmitter respectively in registry with the transmitter and the receiver of said coupling device, a controllable electronic amplifier in the receiving circuit of said interoffice system, a signal device and switching means for energizing said amplifier and said signal device when said French telephone instrument occupies its position on said acoustical coupling device.

33. A system of telephonic communication comprising in combination, a public telephone system having a subscriber's telephone set including a base and a removable French type telephone instrument normally supported thereon, an electrically independent interoffice system having an operator's station and a branch station interconnected by independently operable transmitting and receiving circuits respectively including a transmitter at one station and a receiver at the other station, an acoustical coupling device at the operator's station disposed adjacent to the French telephone instrument and comprising the transmitter and the receiver of the interoffice system at the operator's station disposed in fixed spaced relation corresponding to the spacing of the receiver and the transmitter of said French telephone instrument, means for supporting said French telephone instrument in acoustical relation to the receiver and the transmitter of said coupling device when the French telephone instrument is removed by the operator from its base and placed upon said coupling device with the receiver and the transmitter respectively of the French telephone instrument in registry with the transmitter and the receiver of said coupling device, a controllable amplifier in the receiving circuit of the interoffice system, a loud speaker at said operator's station and a switch at said operator's station having a neutral position in which the loud speaker is connected into the transmitting circuit of the interoffice system, an operating position in which the loud speaker is connected into the transmitting circuit of the interoffice system and the amplifier is energized, and another operating position in which the loud speaker at the operator's station is cut out of service while the amplifier is energized.

34. A system of telephonic communication comprising in combination, a public telephone system having a French type telephone instrument normally adapted to be supported upon a cradle and embodying a transmitter and a receiver in fixed spaced relation at the opposite ends of a connecting hand grip, an electrically independent interoffice telephone system including an operator's station and a branch station

interconnected by independently operable receiving and transmitting circuits, the receiving circuit including the transmitter of the interoffice system at the operator's station and the receiver of the interoffice system at the branch station, and the transmitting circuit including a transmitter of the interoffice system at the branch station and a receiver of the interoffice system at the operator's station, an acoustical coupling device located at the operator's station adjacent to and within reach of the French telephone instrument and embodying a panel having openings therein in corresponding spaced relation to the fixed spacing of the transmitter and the receiver of said telephone instrument, and with which openings the transmitter and the receiver of said telephone instrument are placed in registry by the operator after said telephone instrument has been manually removed from its normal position on its cradle, said transmitter and said receiver of the interoffice system at the operator's station being disposed behind said openings in acoustical relation with the receiver and the transmitter respectively of said French telephone instrument.

35. A system of telephonic communication comprising in combination, a public telephone system having a subscriber's telephone set comprising a base and a removable French type telephone instrument normally supported thereon, an electrically independent interoffice system having an operator's station and a branch station interconnected by independently operable transmitting and receiving circuits respectively including a transmitter at one station and a receiver at the other station, an acoustical coupling device comprising the transmitter and the receiver of the interoffice system at the operator's station disposed adjacent and in registry with the receiver and the transmitter respectively of said French telephone instrument, a manually operable switch for rendering operable the receiving circuit of the interoffice system and mechanical means responsive to the operation of said switch for lifting the French telephone instrument slightly from its cradle to establish acoustical relations between it and the receiver and the transmitter of said coupling device.

36. A system of telephonic communication comprising in combination, a public telephone system having a subscriber's telephone set comprising a base and a removable French type telephone instrument normally supported thereon, an electrically independent interoffice system having an operator's station and a branch station interconnected by independently operable transmitting and receiving circuits respectively including a transmitter at one station and a receiver at the other station, an acoustical coupling device comprising the transmitter and the receiver of the interoffice system at the operator's station disposed adjacent and in registry with the receiver and the transmitter respectively of said French telephone instrument, a manually operable switch for rendering operable the receiving circuit of the interoffice system, mechanical means responsive to the operation of said switch for lifting the French telephone instrument slightly from its cradle to establish acoustical relations between it and the receiver and the transmitter of said coupling device, and means responsive to the operation of said switch for effecting the operation of a signal so long as said acoustical relation is maintained.

37. A system of telephonic communication comprising in combination, a public telephone system having a subscriber's telephone set including a base and removable French type telephone instrument normally supported thereon, an electrically independent interoffice system having an operator's station and a branch station interconnected by independently operable transmitting and receiving circuits respectively including a transmitter at one station and a receiver at the other station, an acoustical coupling device at the operator's station disposed adjacent to the French telephone instrument and comprising the transmitter and the receiver of the interoffice system at the operator's station disposed in fixed spaced relation corresponding to the spacing of the receiver and the transmitter of said French telephone instrument, means for supporting said French telephone instrument in acoustical relation to the receiver and the transmitter of said coupling device when the French telephone instrument is removed by the operator from its base and placed upon said coupling device with the receiver and the transmitter of the French type instrument in registry with the transmitter and the receiver respectively of said coupling device, the receiver and the transmitter at said branch station being disposed in spaced relation at the ends of a hand grip device, a normally open switch in both of said operably independent receiving and transmitting circuits disposed in said hand grip device and adapted to be held in closed operative position by the user and means controllable at the operator's station for signalling the branch station.

38. A system of telephonic communication comprising in combination, a public telephone system having a subscriber's telephone set including a base and a removable French type telephone instrument normally supported thereon, an electrically independent interoffice system having an operator's station and a plurality of branch stations interconnected by independently operable transmitting and receiving circuits respectively including a transmitter at one station and a receiver at another station, an acoustical coupling device at the operator's station disposed adjacent to the French telephone instrument and comprising the transmitter and the receiver of the interoffice system at the operator's station disposed in fixed spaced relation corresponding to the spacing of the receiver and the transmitter of said French telephone instrument, means for supporting said French telephone instrument in acoustical relation to the receiver and the transmitter of said coupling device when the French telephone instrument is removed by the operator from its base and placed upon said coupling device with the receiver and the transmitter of the French telephone instrument in registry with the transmitter and the receiver respectively of said coupling device, the receiver and the transmitter at

each branch station being disposed in fixed spaced relation at the ends of a hand grip device, a normally open switch in both of said independently operable receiving and transmitting circuits disposed in the hand grip device and adapted to be held in closed operative position by the user, and a separate and independent selective interoffice signal and telephone system interconnecting the operating station and each of the branch stations.

39. A system of telephonic communication comprising in combination, an interoffice telephone system having an operator's station and a branch station interconnected by independently operable transmitting and receiving circuits whereby telephonic communication may take place between the operator's station and the branch station in the conventional manner, a public telephone system having a subscriber's telephone set disposed at said operator's station and comprising a supporting base and removable French type telephone instrument electrically independent of said interoffice system whereby telephonic communication may take place in the conventional manner between the public telephone instrument and an outside party, and means at the operator's station and including an acoustical coupling device associated with the independently operable receiving and transmitting circuits of said interoffice system for establishing telephonic communication between the interoffice system and the public telephone system by the removal by the operator of the French telephone instrument from its normal supporting base and the placing of said instrument by the operator in acoustical relation with said acoustical coupling device.

40. A system of telephonic communication comprising in combination, a public telephone system having a subscriber's telephone instrument, an electrically independent interoffice system having independently operable receiving and transmitting circuits, switching means for rendering said interoffice system operative and inoperative, means for acoustically coupling said subscriber's telephone instrument and said interoffice system when said switching means is in operative position and preventing the operation of said switching means to inoperative position until such time as the acoustical coupling is broken.

41. A system of telephonic communication comprising in combination, a public telephone system having a subscriber's telephone instrument, an electrically independent interoffice system including a transmitting and a receiving circuit, means for acoustically coupling said interoffice system with said public telephone instrument, amplifying means in said transmitting circuit, a loud speaker and a receiver arranged to be connected in said transmitting circuit of the interoffice system and switch means arranged in said transmitting circuit for selectively rendering operable either the loud speaker or the receiver in said circuit.

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