May 13, 1941. LA MAR E. HAYSLETT ET AL 2,241,663

SYSTEM OF COMMUNICATION

Filed Sept. 3, 1940 3 Sheets-Sheet 1

FIG. 1

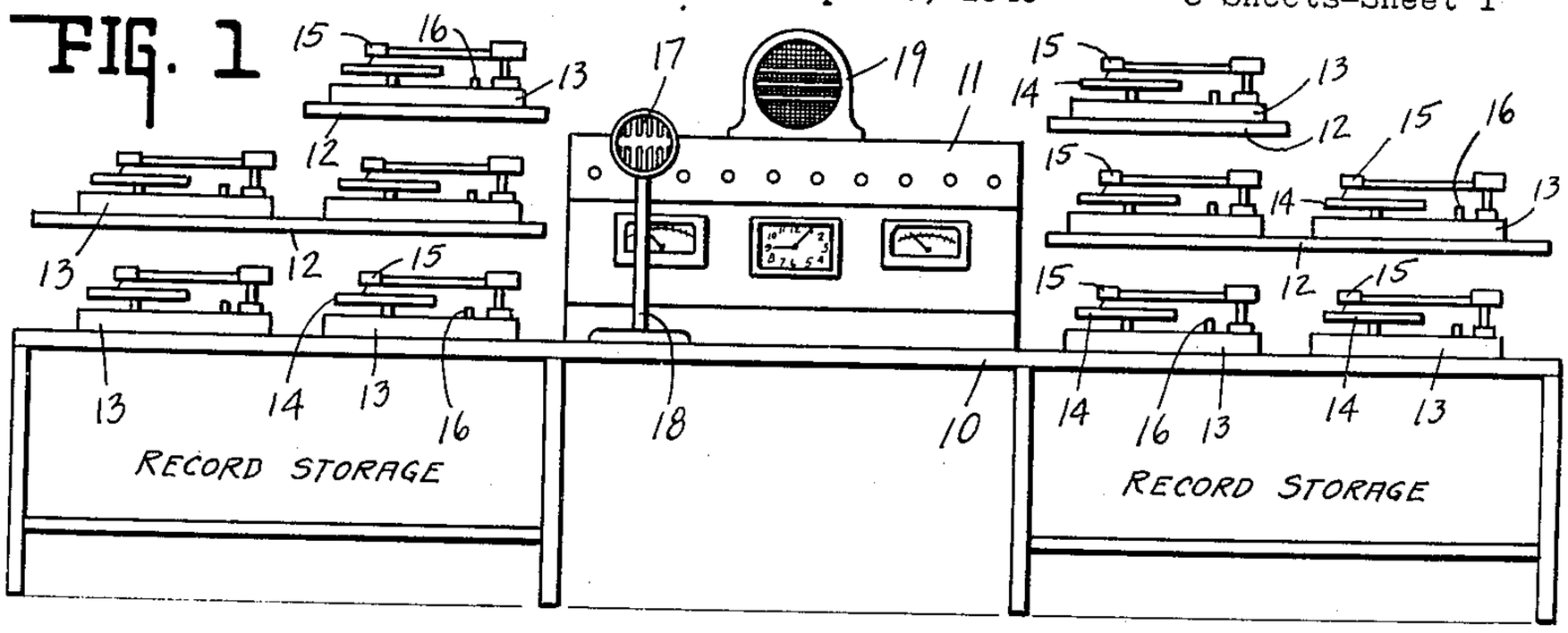



FIG. 2

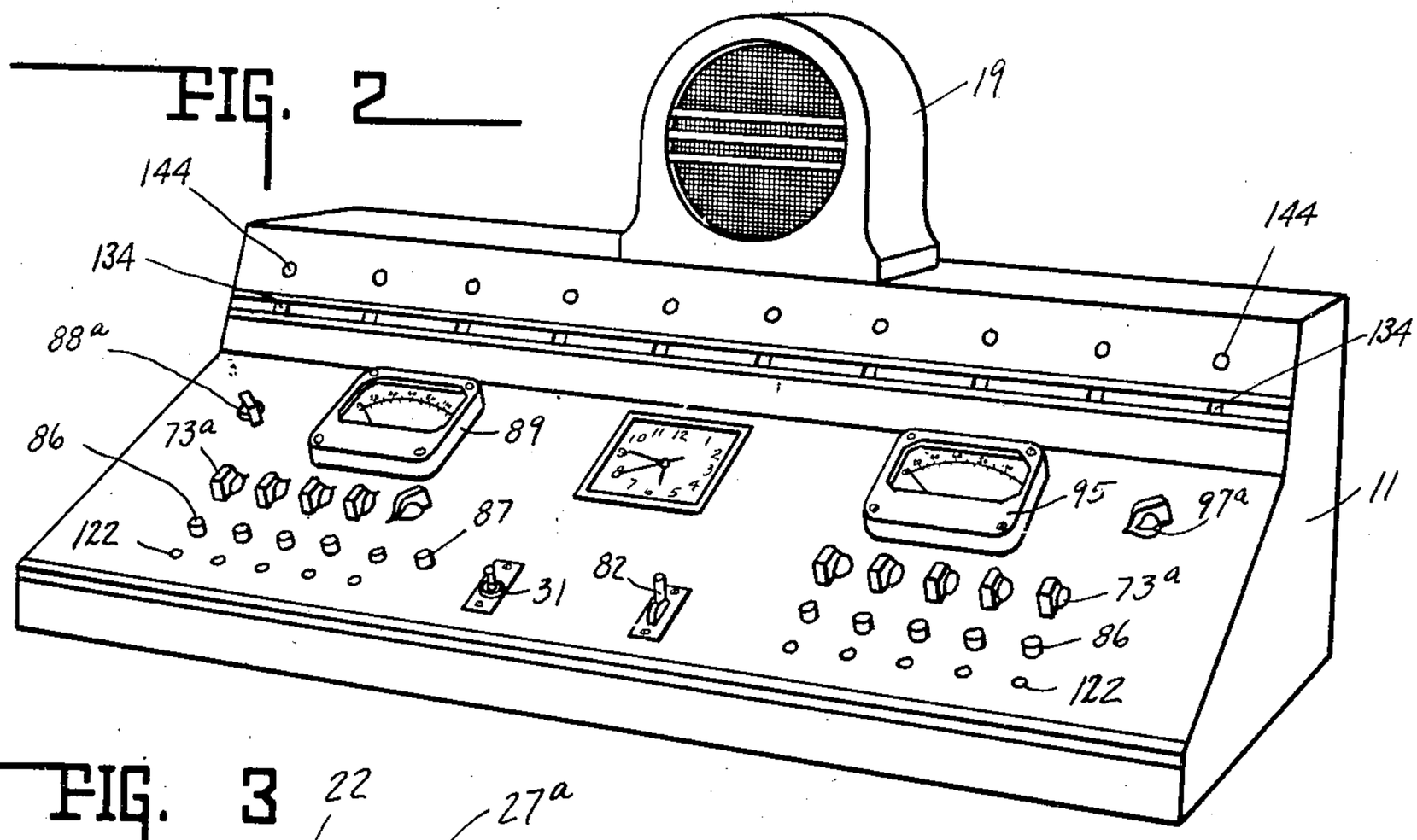
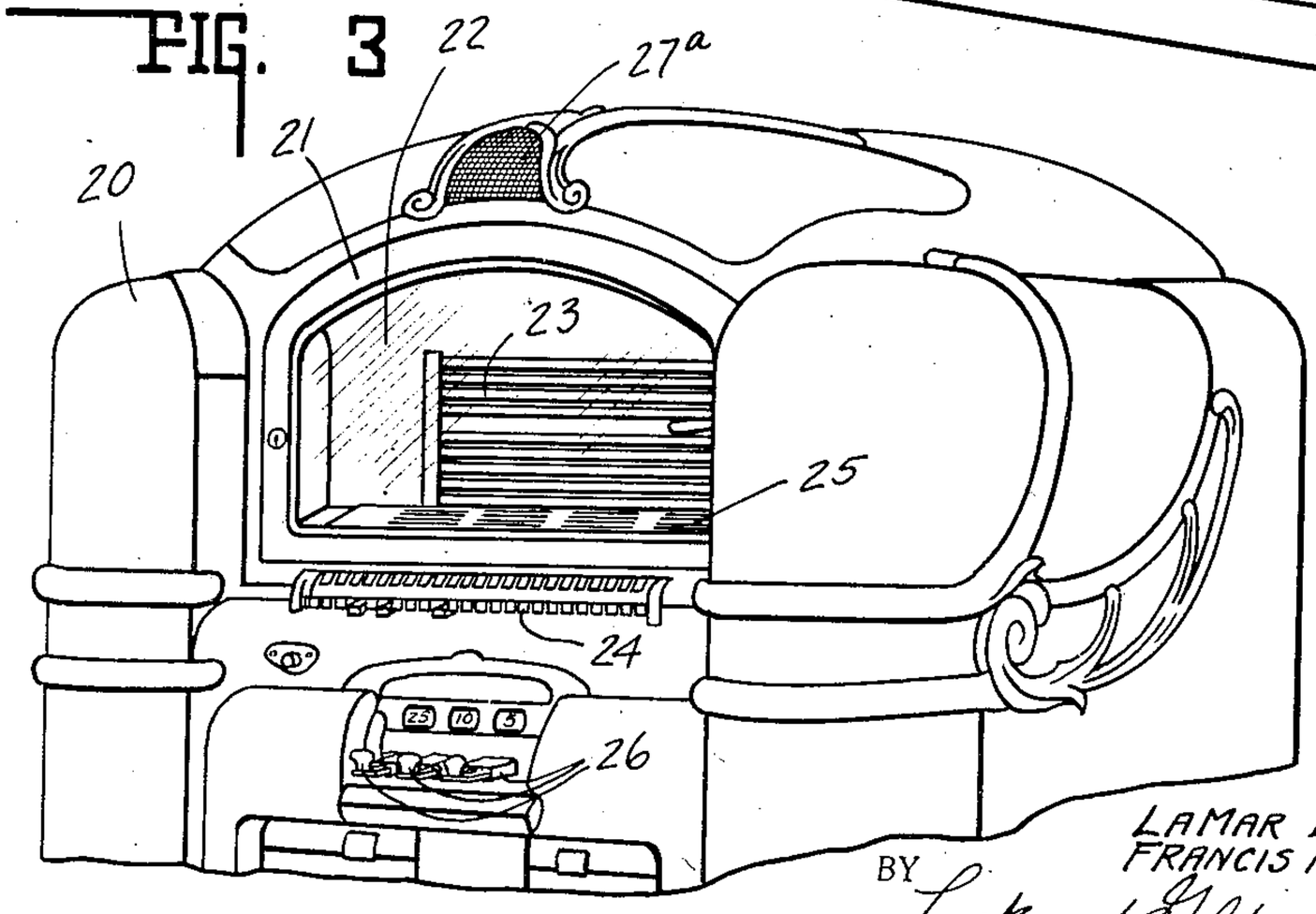



FIG. 3




INVENTORS.
LAMAR E. HAYSLETT.
FRANCIS M. SCHMIDT.

BY Lockwood, Goldsmith & Galt,
ATTORNEYS.

May 13, 1941. LA MAR E. HAYSLETT ET AL 2,241,663

SYSTEM OF COMMUNICATION

Filed Sept. 3, 1940 3 Sheets-Sheet 2

FIG. 4

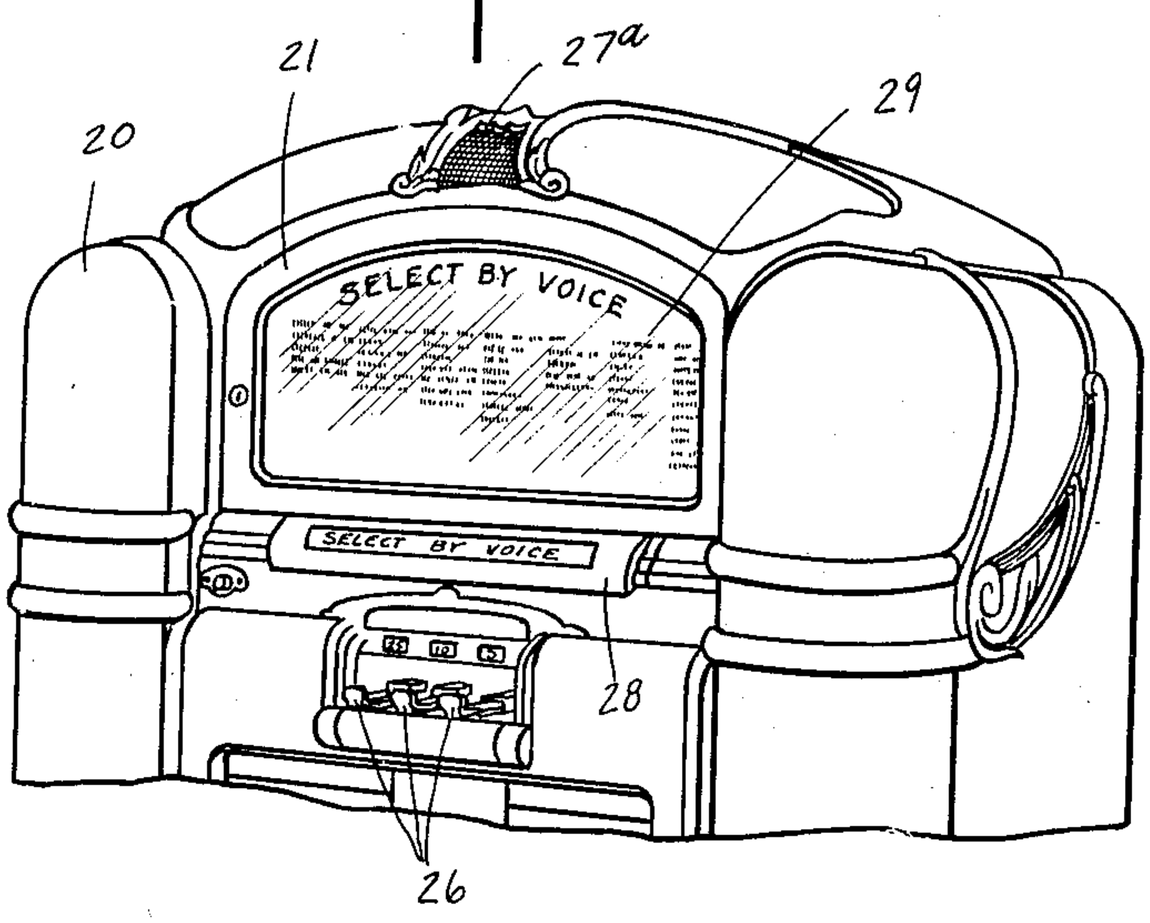



FIG. 5

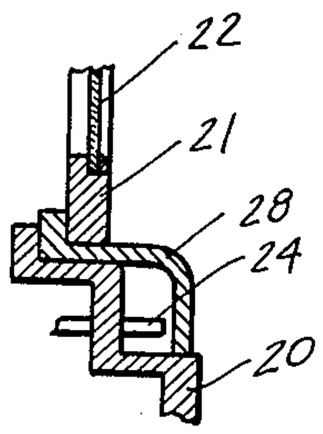
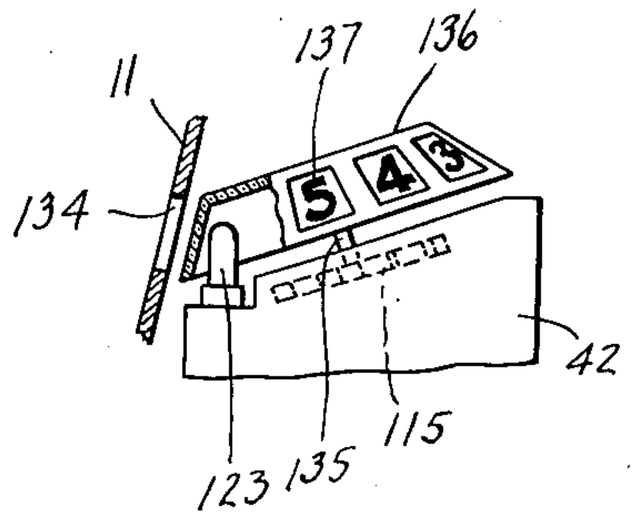



FIG. 6




INVENTORS.
LAMAR E. HAYSLETT.
FRANCIS M. SCHMIDT.

BY Lockwood, Goldsmith & Galt,
ATTORNEYS.

May 13, 1941. LA MAR E. HAYSLETT ET AL 2,241,663

SYSTEM OF COMMUNICATION

Filed Sept. 3, 1940 3 Sheets-Sheet 3

FIG. 7

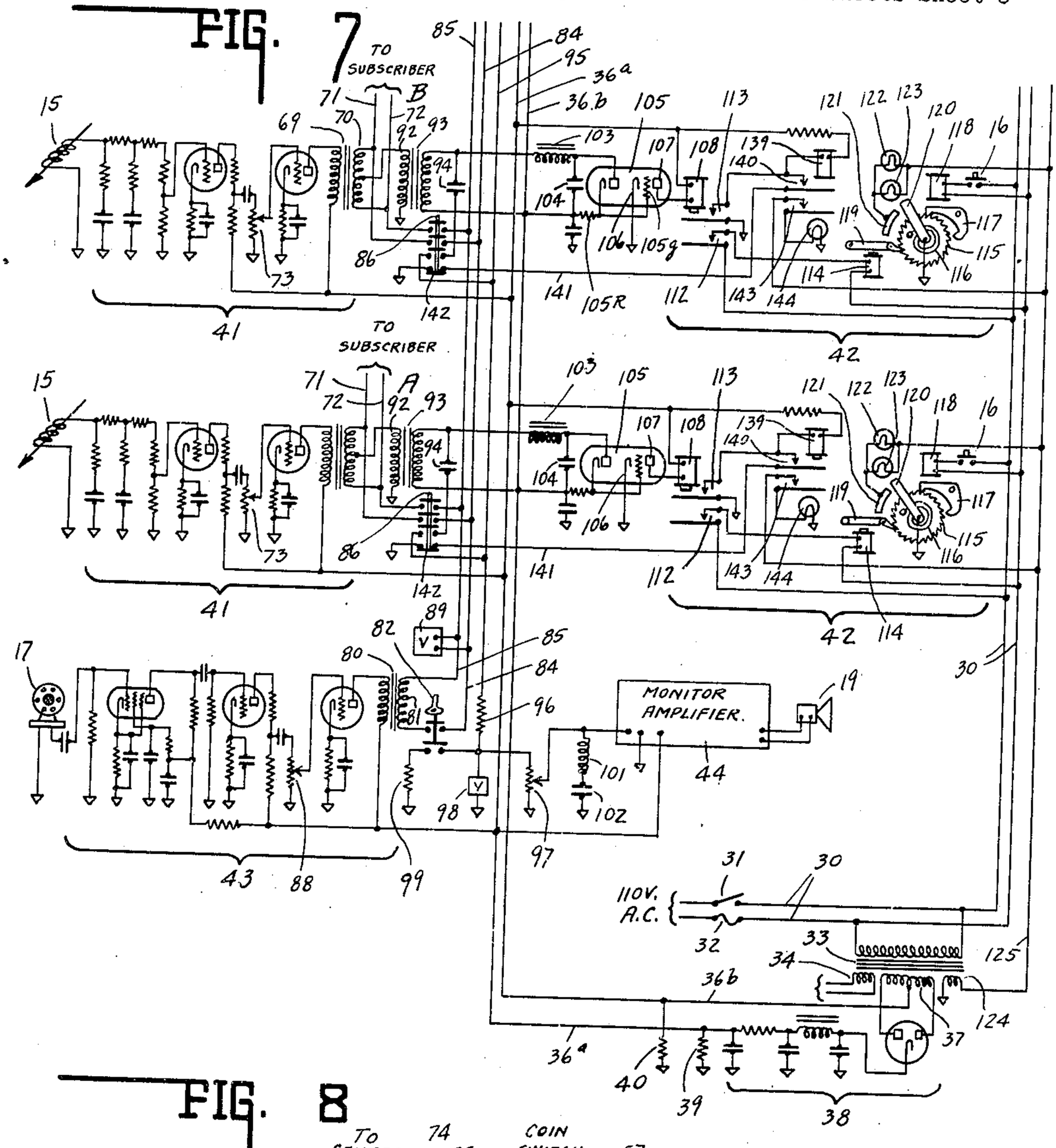
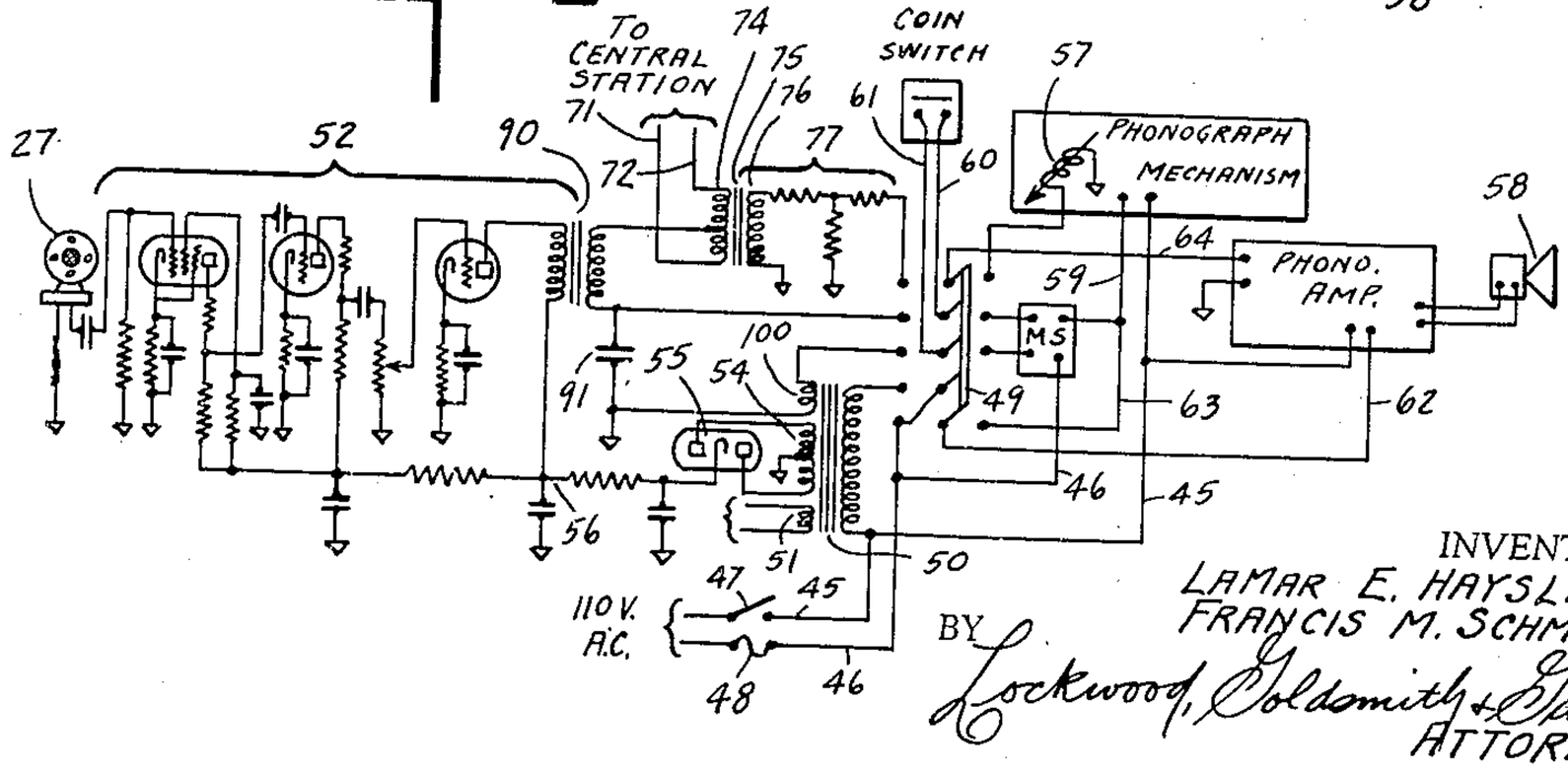



FIG. 8




INVENTORS.
LAMAR E. HAYSLETT.
FRANCIS M. SCHMIDT.
BY Lockwood, Goldsmith & Galt.
ATTORNEYS.

Patented May 13, 1941

2,241,663

# UNITED STATES PATENT OFFICE

2,241,663

## SYSTEM OF COMMUNICATION

La Mar E. Hayslett, Kenmore, and Francis M. Schmidt, North Tonawanda, N. Y., assignors to The Rudolph Wurlitzer Company, Cincinnati, Ohio, a corporation

Application September 3, 1940, Serial No. 355,140

7 Claims. (Cl. 179—6)

This invention relates to a system of communication particularly adapted to the dispensing of music or other form of audible entertainment from a central station to a plurality of subscriber's stations.

One object of the invention is to increase the interest in entertainment of this type in restaurants and other establishments where coin-operated phonographs are generally installed. This object is attained by the provision of means by which a person desiring to hear a given selection after depositing a coin may make his selection orally by speaking directly to the phonograph in response to an inquiry from a central station operator transmitted through the speaker of the phonograph. This arrangement introduces a novel personal element in the operation of mechanism of this kind which stimulates the interest of prospective customers and increases the income from such apparatus.

Another object of the invention is to provide a central station system for dispensing entertainment which requires a minimum of wiring connection between the central station and subscriber's stations. In the preferred form of the apparatus described herein a single two-wire metallic circuit is used between the central station and each subscriber's station. Return talk and all necessary signals are transmitted by a grounded simplex or half-phantom circuit connected to the two-wire circuit without interfering in any way with the transmission of programs and voice on the two-wire circuit.

Another object of the invention is to provide suitable apparatus by means of which ordinary mechanical selection of programs may be accomplished during hours of slack business when it is not advantageous to have a central operator at work.

Another object of the invention is to provide for multiple coin operation in such manner that the central station operator may be informed at all times of the number and value of coins which have been deposited and may supply the corresponding number of selections.

Another object of the invention is to provide means by which the central station operator may be immediately notified of the receipt of a coin whether or not all selections have been delivered for coins previously received.

In the preferred form of the invention described herein, there is provided a central station having a plurality of phonograph mechanisms each provided with a pickup, turntable and associated operating apparatus and each normally connected through suitable amplifiers to a speaker at one of a number of subscriber's stations. The central station is also provided with a coin registering device for each of the subscriber's stations and said devices are normally connected to and operated by coin receivers at the subscriber's stations. The central station is also provided with a transmitter and receiver which may be any suitable type employed in telephone transmission or may be of the microphone and speaker type as desired. Each subscriber's station is provided with a transmitter preferably of the microphone type and preferably installed in the same cabinet as the subscriber's speaker. At the central station, keying means are used for selectively connecting the central transmitter to the speaker at any one of the subscriber's stations and for connecting the corresponding subscriber's transmitter to the central station receiver. At each subscriber's station there is provided in addition a local record changing phonograph mechanism equipped with the usual magazine switch and with a change-over switch adapted alternatively to connect the speaker and usual phono-amplifier to the local phonograph mechanism or to the central station and to connect the coin receiver to the magazine switch or to the central station.

Other objects and features of the invention will be understood from the accompanying drawings and the following description and claims:

Fig. 1 is a diagrammatic elevational view showing a preferred arrangement of the central station. Fig. 2 is a perspective view of the central station operator's control board. Fig. 3 is a perspective view of the upper portion of a phonograph cabinet used at a subscriber's station, with parts arranged for the ordinary mechanical operation. Fig. 4 is a similar view of the same cabinet with parts arranged for central station operation. Fig. 5 is a sectional view showing an arrangement of parts by which the mechanical selector keys of the cabinet shown in Figs. 3 and 4 are made inaccessible when central station operation is in use. Fig. 6 is an elevational view partly in section showing a preferred form of coin register unit used with the central station control board of Fig. 2. Fig. 7 is a diagram of electrical connections at the central station. Fig. 8 is a diagram of electrical connections at one of the subscriber's stations.

Referring now particularly to Fig. 1, in which there is illustrated a preferred arrangement of the central station, there is provided a table or

shelf 10 on which there is mounted a control board 11 shown in more detail in Fig. 2. On table 10 at each side of the control board 11 and on shelves 12 there are provided a plurality of phonograph mechanisms 13 each equipped with a turntable 14, a pickup 15 and the necessary mechanism, not shown, for rotating the turntable. The phonograph mechanisms 13, herein shown as ten in number, are conveniently placed to be operated by an operator seated before the control board 11. Each phonograph mechanism is provided with a checkoff switch 16, the purpose of which will be described hereinafter. A transmitter in the form of a microphone 17 is provided and may be mounted on a stand 18 placed on the table 10 in front of the control board 11. A receiver 19 preferably in the form of the conventional speaker, is placed above the control board 11. Beneath the table 10 and at each side thereof there is provided space indicated by name for record storage, readily accessible to the operator. The control board 11 is provided with various switches, volume controls and other instruments which will be described in detail in connection with the electric circuits of which they form a part.

Referring now to Fig. 3, showing a form of phonograph cabinet employed at the subscriber's station, said cabinet 20 is provided with the usual front door 21 having a glass window 22 therein through which a record magazine 23 and record changing mechanism of any well known form are visible. Beneath the door 21 there is provided a plurality of selector keys 24 adapted to control the selection of records contained in the magazine 23 in accordance with similarly numbered program cards 25 which are visible through the window 22. The cabinet also includes three coin receivers 26 of any well known type adapted to receive coins of different denominations. Above the door 21 there is provided a screen 27*a* behind which there is mounted a subscriber's microphone 27.

Referring now to Fig. 4, the same phonograph cabinet is shown arranged for central station operation. In this arrangement the selector keys 24 are covered by a panel 28 carrying the legend "Select by Voice." Said panel is arranged as best shown in Fig. 5 and is placed in position by first opening the door 21, inserting the panel and then closing and locking said door. At the same time, a selection list 29 printed on heavy cardboard or other suitable material and bearing the legend "Select by Voice" is placed in a suitable retainer behind the glass window 22. Said selection list effectively hides the selection cards 25 and the mechanical record changing mechanism from the view of prospective customers. The electrical connections by which the changeover from mechanical to central station operation is performed are described hereinafter.

*Central station electrical apparatus*

Referring now to Fig. 7 in which there is shown the electrical apparatus at the central station, power for operating the central station is received from any suitable source on power mains 30 and preferably is the usual commercial 110 volt alternating current. One of said power mains has connected therein a cutout switch 31 and the other carries the usual overload fuse protection 32. A transformer 33 has its primary winding connected to the mains 30 and is provided with a secondary winding 34 providing alternating current at a low voltage suitable for heating the cathodes of the vacuum tubes used in the various amplifiers at the central station. The connection of the cathode heaters may be conventional and for that reason is not shown in the drawings. Direct current is supplied to a pair of distributory conductors 36*a* and 36*b* from a secondary winding 37 of transformer 33 connected through a conventional rectifier unit 38. Said distributory conductors are grounded through resistors 39 and 40 respectively. Resistor 39 is proportioned to maintain the conductor 36*a* at a suitable positive potential to supply plate current for the several amplifier units and to operate certain direct current relays. Resistor 40 is proportioned to maintain conductor 36*b* at a negative potential of a few volts.

Other central station electrical apparatus includes a phonograph preamplifier 41 associated with each of the phonograph pickups 15. Two of said preamplifiers are shown in detail in Fig. 7 and the remainder may be similar. A coin signal device 42 for each subscriber's station is also located at the central station and two of said devices are shown diagrammatically in Fig. 7. The central station transmitter 17 is equipped with a preamplifier 43 and the central station speaker 19 is equipped with an amplifier 44.

*Subscriber's station electrical apparatus*

Referring now to Fig. 8, in which there is diagrammatically shown the electrical apparatus of one subscriber's station, power for operating the station is supplied on a pair of power mains 45 and 46 connected to any suitable source, preferably 110 volt alternating current. One of said power mains is provided with a cutout switch 47 and the other carries a protecting fuse 48. A changeover switch 49, herein shown as a two-position multi-polar knife switch, is provided for the purpose of changeover from central station operation to local mechanical selection. When thrown to the left in Fig. 8 for central station operation, said switch connects the power mains 45 and 46 to the primary winding of a transformer 50. Said transformer is equipped with a secondary winding 51 adapted to supply low voltage alternating current for heating the cathodes of vacuum tubes used in the local microphone preamplifier 52 associated with the local microphone 27. Said microphone is preferably located behind the screen 27*a* in the cabinet 20 as previously described. The transformer 50 is provided with a secondary winding 54 connected to a rectifier tube 55 supplying direct current at a suitable potential above ground to a conductor 56. Within the preamplifier 52 suitable plate voltages are secured by conventional connections to the conductor 56.

Other apparatus at the subscriber's station shown diagrammatically in Fig. 8 includes a phonograph mechanism indicated by name and provided with a pickup 57, a speaker 58, an amplifier for said speaker indicated "PHONO AMP," a magazine switch indicated "MS" and a coin switch indicated "COIN SW." All of said apparatus is preferably housed in the cabinet 20 and may be of any construction suitable for coin controlled phonograph operation. Since the details of such constructions form no part of the present invention and are well known in many forms, it is sufficient to describe briefly the function of the coin switch and magazine switch.

The coin switch is associated with and forms a part of the coin receivers 26. It is arranged to be momentarily closed one or more times in

response to the receipt of a coin in any one of said receivers, the number of such operations being proportional to the value of the coin received. The magazine switch may be of a well known type adapted to control the power supply to the phonograph mechanism in response to electrical impulses received from operation of the coin switch.

*Wiring and operation*

The wiring connections shown in Figs. 7 and 8 may best be described in connection with a description of the operation of the apparatus.

*Operation—local mechanical selection*

Power for operating the phonograph mechanism is supplied by direct connection to power main **45** and by connection to power main **46** through conductor **59** and the magazine switch MS. When the changeover switch **49** is thrown to the right in Fig. 8, the magazine switch is connected to conductors **60** and **61** leading to the coin switch and its operation is controlled by operation of the coin switch. At the same time, power for operating the phono-amplifier and speaker is supplied by direct connection to power main **45** and by connection to power main **46** through conductor **62**, switch **49**, conductor **63** and the magazine switch. The pickup **57** is connected to the phono-amplifier through switch **49** and conductor **64**. These connections complete all circuits necessary for local operation of the phonograph. When switch **49** is thrown to the left, the pickup **57** is disconnected from the amplifier, the coin switch is disconnected from the magazine switch and conductor **62** is directly connected to power main **46** for operation of the phono-amplifier and speaker **58** independently of the magazine switch.

*Phonograph transmission from central station*

The output of each of the pickups **15** at the central station is preamplified by its associated amplifier **41** and is impressed on the primary winding of an output transformer **69**. The secondary winding **70** of said transformer has its terminals connected to a pair of conductors **71** and **72** leading to the corresponding subscriber's station. The volume of the output impressed on the conductors **71** and **72** is controlled by a variable resistor **73** operated by control knob **73***a* on the central station control board **11** (Fig. 2). At the subscriber's station the conductors **71** and **72** are connected to the terminals of the primary winding **74** of an input transformer **75**. The secondary winding **76** of said transformer has one terminal grounded and the other terminal connected through a series of resistance units **77**, the changeover switch **49** and conductor **64** to the phono-amplifier and speaker. The function of the resistance units **77** is to modify the output received from the transmission lines **71** and **72** to give it substantially the same characteristics as the output of the pickup **57**.

By means of these connections, each of the phonograph units **13** at the central station is connected by a two-wire metallic circuit to the corresponding subscriber's station and each may be manually operated by the central station operator to deliver a desired selection to the subscriber's speaker.

*Voice transmission—central station to subscriber's stations*

The output of the central station transmitter **17** is amplified by its preamplifier circuits **43** and is impressed on the primary winding of an output transformer **80**. The secondary winding **81** of said transformer has one terminal connected through a switch operated by a key **82** to a bus line **84** and its opposite terminal connected to a bus line **85**. Said bus lines may be selectively connected to the conductors **71** and **72** of any given subscriber's station by operation of normally open switches controlled by push buttons **86**, one of said push buttons being provided for each of the subscriber's stations. The push buttons **86** are mechanically interlocked in a well known manner so as to be mutually exclusive. That is, each push button when pressed is latched in position to connect its associated subscriber's station to the bus lines **84** and **85** and automatically release to the normal position any of said push buttons which have been previously pressed. A push button **87** is provided for manually releasing all of the buttons **86** when it is desired that none of the subscriber's stations be connected to the bus lines. The volume of the output is controlled by a variable resistor **88** operated by a knob **88***a* on the control board **11** (Fig. 2). A meter **89** mounted on the control board is connected across the bus lines **84** and **85** to indicate the energy level of the output to the subscriber's station which may be connected to said bus lines.

By means of the connections just described, the amplified output of the central station transmitter may be impressed on the two-wire metallic circuit leading to any one of the subscriber's stations by operation of the appropriate push button **86** and the talking key **82**. Since the secondaries of transformers **69** and **80** are in parallel connection, the voice output may be superimposed on a musical program already in progress of transmission. By manipulation of the volume controls **73** and **88** the operator may adjust the combined output of the phonograph and voice units to the proper level for transmission over commercial telephone wires as indicated by the meter **89** and may reduce the volume of the phonograph output to make the voice clearly audible, if necessary. The operator is aided in making the latter adjustment by the fact that the subscriber's transmitter **27** is sufficiently close to the subscriber's speaker **58** so that the output of said speaker is fed back to the central station receiver through the return talk circuits now to be described.

*Voice transmission—subscriber's station to central station*

The output of the subscriber's station transmitter **27** is amplified by its preamplifier circuits **52** and is fed to the primary winding of an output transformer **90**, the secondary winding of which has one terminal connected to the midpoint of the winding **74** of transformer **75** and the other terminal grounded through a condenser **91** having proper capacity for freely transmitting alternating currents of audible frequencies. At the central station the midpoint of winding **70** of each transformer **69** is connected to one terminal of the primary winding **92** of a transformer **93**, the opposite terminal of which is grounded. The connections just described will be recognized as a grounded simplex or half-phantom circuit in which alternating current energy induced in the secondary winding of transformer **90** is transmitted over conductors **71** and **72** in parallel, through windings **70** and **92** to ground and returns through

ground and condenser 91 to transformer 90. By proper balance of the windings 74 and 70 the current flow in conductors 71 and 72 may be made equal, the two current components have equal and opposite effects on the winding 76 and so do not interfere with transmission to the subscriber's station.

One terminal of the secondary winding of transformer 93 is connected through a condenser 94 and a normally open switch controlled by push button 96 to a bus line 95 which is grounded through a resistor 96 and a potentiometer 97. The opposite terminal is connected to ground through distributory conductor 36b and resistance 49 to complete a secondary circuit. The potentiometer 97 is operated by a knob 97a (Fig. 2) to by-pass a variable portion of the energy in the secondary circuit to the amplifier 44 for the central station transmitter 19. By thus varying the total resistance of the circuit the current flow and voltage may be controlled by the operator to keep the volume level within the limits required for transmission over commercial telephone lines. The level of volume is indicated by a meter 98 connected across the potentiometer 97.

A resistor 99 may be shunted across the potentiometer 97 by operation of a normally open switch controlled by the talking key 82 and serves to reduce the output volume of speaker 19 when so connected. By this means the central station operator may have the benefit of as large a volume from the speaker 19 as may be desired as long as the central station transmitter is not connected for transmission. When the later connection is made, the volume level of the speaker 19 is automatically reduced to prevent the sound from feeding back into the transmitter 17 and causing an undesirable blare in the subscriber's speaker.

*Signal transmission*

When the changeover switch 49 at any subscriber's station is thrown to the left (Fig. 8), the conductors 60 and 61 leading to the coin switch are disconnected from the magazine switch MS and are connected respectively to the midpoint of transformer winding 74 through the secondary winding of transformer 90 and to one terminal of a secondary winding 100 of transformer 50, the opposite terminal of which is grounded. By this means the operation of the coin switch impresses on the simplex transmission circuit to the central station a signal in the form of an alternating voltage having the frequency of the alternating current power supply. Said frequency is preferably 60 cycles per second.

At the central station the incoming low frequency coin signal is transmitted to the secondary circuit of transformer 93 in the same manner as the incoming voice signals but the coin signal is prevented from reaching the amplifier 44 by a reactance unit 101 and condenser 102 connected in series across the input lines to said amplifier and serving to filter out the lower frequencies. A reactance 103 and condenser 104 connected in series across the secondary terminals of transformer 93 serve as a low pass filter to transmit the coin signal to a tube 105 having suitable electrodes and connections for rectification and amplification.

The amplifier cathode 106 of said tube is grounded and the amplifier anode 107 is connected to an electromagnetic relay 108, the opposite terminal of which is connected to the positive direct current distributory conductor 36a. The amplifier grid 105g is normally biased to cut off by connection to conductor 36b. Each time a coin signal is received, the flow of rectified current through cathode resistor 105R increases the grid potential to a point where sufficient current may flow to operate relay 108. By means of these connections each momentary closure of the coin switch at one of the subscriber's stations momentarily actuates the corresponding relay 108 at the central station.

Each momentary actuation of the electromagnet 108 momentarily closes a pair of normally open switches 112 and 113. The operation of switch 112 completes a circuit from the alternating current power mains 30 for operation of an electromagnet 114. Said magnet forms part of a coin register device consisting of a ratchet wheel 115 normally urged in the clockwise direction by a coil spring 116. Said ratchet wheel is held in position by an escapement 117 operated by an electromagnet 118 and is moved against the action of spring 116 by means of a pawl 119 operated by the magnet 114. The ratchet wheel 115 carries a grounded contact member 120 adapted to engage a contact segment 121. In the normal idle position of the apparatus when no coin signals have been received from the subscriber's station, the contact member 120 is out of engagement with the contact segment 121 as shown in Fig. 7. Upon receipt of a coin having unit value the magnet 114 is momentarily actuated and operates the pawl 119 to move the ratchet wheel 115 to engage the contact members 120 and 121. Successive actuations of the magnet 114 by receipt of additional coins or by coins of more than unit value move the ratchet wheel 115 still farther in the counter-clockwise direction. The contact segment 121 is made sufficiently long to maintain contact through any desired number of such actuations. The checkoff magnet 118 is operated by the push button switch 16 previously mentioned which completes a circuit for said magnet from the alternating current power mains 30. The magnet 118 operates the escapement 117 to permit the spring 116 to move the ratchet wheel 115 one step in the clockwise direction. Obviously when the number of actuations of magnet 118 equals the number of coin values which have been registered by the magnet 114, the contact member 120 has returned to initial position and contact with the segment 121 is broken.

The engagement of contact members 120 and 121 completes a circuit for a pair of signal lamps 122 and 123, said circuit leading from a secondary winding 124 of transformer 33, through a conductor 135 to said lamps and thence through said contact members to ground and to a grounded terminal of winding 124. The lamp 122 is located on the operator's control board as shown in Fig. 2 and the lamp 123 is positioned behind said board as best seen in Fig. 6. The control board 11 is provided with a number of openings 134 behind each of which is positioned the coin register unit 42 of one of the subscriber's stations. In Fig. 6 the ratchet wheel 115 of one of said units is indicated and is mounted on an inclined shaft 135 carrying a transparent frustoconical member 136. Said member is positioned to be visible through the opening 134 and carries opaque figures 137, one of which is visible through said openings at each position of the ratchet wheel 115. The lamp 123 positioned

within the frusto-conical member as shown in Fig. 6 increases the visibility of the numbers 137.

By means of the construction just described, the signal lamps 122 and 123 are lighted for a given subscriber's station when a coin has been deposited at that station. Said lamps remain lighted until a corresponding number of selections have been checked off by operation of the push buttons 16. The position of the ratchet wheel 115 and the indication of said position afforded by the figures 137, visible through the opening 134, indicates to the central station operator how many selections are still to be delivered to that subscriber's station.

The operation of the switch 113 each time the electromagnet 108 is actuated completes a circuit from the positive direct current supply line 36a through a resistor 138, an electromagnetic relay 139 and switch 103 to ground. The relay 139 is of the type known as a "stick" relay,—that is, it is provided with a holding circuit which is completed when the relay is actuated and holds the relay in energized condition even though the original actuating circuit is broken. The holding circuit leads from said relay, through a switch 140, a conductor 141 and a normally closed switch 142 to ground. The switch 142 is opened by actuation of the push button 86 at the same time that the normally open switches controlled by said push button are closed. The switch 140 is closed to complete the holding circuit by the actuation of the magnet 139 and retains the magnet in the actuated condition after switch 113 is opened until switch 142 has been opened.

The actuation of magnet 139 closes a switch 143 which completes a circuit from the alternating current supply line 125 to a lamp 144, the opposite terminal of which is grounded. Said lamp therefore is lighted as long as the relay 139 is energized. By means of this arrangement the lamp 144 is lighted when a coin has been deposited at the corresponding subscriber's station. When the operator presses the key 86 to connect the central station receiver 19 to the transmitter at the subscriber's station, the switch 142 is opened, the relay 139 is deenergized and lamp 144 is extinguished. The lamp 144 thus performs a different function than the lamps 122 and 123 since it indicates only that a coin has been deposited but that no connection has yet been made for return talk from that particular subscriber's station. If a number of coin values have been received at the subscriber's station, the lamps 122 and 123 remain lighted until the corresponding number of selections have been delivered but the lamp 144 is extinguished as soon as the call from the subscriber's station has been answered. If another coin is inserted before the lamps 122 and 123 are extinguished, the lamp 124 is again lighted to indicate the receipt of the additional coin and to notify the operator that the subscriber's station must again be connected for return talk.

*Résumé of operation*

In the operation of the apparatus illustrated herein, the receipt of a coin at any subscriber's station causes the corresponding lamps 122, 123 and 144 to be lighted on the central station control board 11. The operator then presses the corresponding push button 86 extinguishing the lamp 144, connecting the subscriber's transmitter 27 to the central station receiver 19 and conditioning a circuit for connection of the central station transmitter 17 to the subscriber's speaker 58. The operator at the same time may operate the key 82 to complete the last named connection and to reduce automatically the volume level of the central station speaker 19. The operator then requests the customer to name his choice of music and the customer answers by speaking directly to the phonograph cabinet. It is also possible at this time that a pleasant-voiced central station operator may persuade the customer to make an additional deposit for more entertainment. When the customer has named the selection or selections he desires, the operator manually starts the corresponding phonograph mechanism 13 and at the same time checks off one coin value by operating the corresponding switch 16. When there is no occasion for conversation over the line, the operator will ordinarily release the key 82 to disconnect the central station transmitter 17 and will release all of the push buttons 86. However, the operator may at any time press one of the push buttons 86 and listen in on any of the subscriber's stations and may initiate conversations with customers at said stations if desired.

The invention has been described in one of its preferred forms, the details of which may be varied between wide limits without departing from the scope of the invention as defined in the appended claims.

The invention claimed is:

1. In a communication system having a central station and a subscriber's station, a phonograph reproducer mechanism, a coin register device, a telephone receiver, and a telephone transmitter located at said central station, a speaker, a transmitter and a coin receiving device at said subscriber's station, a two-wire metallic electric circuit between said stations, said circuit connecting said reproducer mechanism and said speaker, keying means adapted to connect the central station transmitter in said circuit, electrical connections associated with said two-wire circuit at each station and forming therewith a grounded half-phantom circuit between said stations, said coin register device and said coin receiving device being connected in said half-phantom circuit and said receiving device being adapted to actuate said register device through said circuit upon receipt of a coin, and keying means adapted to connect the subscriber's transmitter and the central station receiver through said half-phantom circuit.

2. The combination defined by claim 1 with the addition of a magazine phonograph mechanism at said subscriber's station, a magazine switch connected to control operation thereof, and a cutover switch and associated wiring adapted to disconnect said speaker and coin receiving device from said two-wire circuit and said half-phantom circuit respectively and to connect the same to said magazine phonograph mechanism and to said magazine switch respectively.

3. In a communication system having a central station and one or more subscriber's stations, a plurality of phonograph reproducer mechanisms, a receiver and a telephone transmitter located at said central station, a speaker and a transmitter located at each of said subscriber's stations, electrical connections between said central station and each of said subscriber's stations adapted to connect the speaker at each station to a corresponding reproducer mechanism, keying means associated with said electrical connections and adapted selectively to connect the

central station receiver to any one of the subscriber's transmitters, switching means adapted to connect the central station transmitter to the speaker at the subscriber's station whose transmitter is so connected, an amplifier operating the central station receiver, a volume control unit associated therewith, and switching means automatically operated with said first mentioned switching means and adapted to control said volume control unit to reduce the volume level of the central station receiver when the central station transmitter is so connected.

4. In a communication system having a central station and one or more subscriber's stations, a plurality of phonograph reproducer mechanisms, a receiver and a telephone transmitter located at said central station, a speaker and a transmitter located at each of said subscriber's stations, a two-wire metallic circuit connecting the speaker at each subscriber's station to a corresponding phonograph mechanism, electrical connections asociated with each of said two-wire circuits and forming therewith a plurality of corresponding grounded half-phantom circuits each connected to the corresponding subscriber's transmitter, keying means adapted selectively to connect the central station receiver to any one of said half-phantom circuits and to condition a connection for the central station transmitter to the corresponding two-wire circuit, and switching means adapted to complete said last mentioned connection.

5. In a communication system having a central station and one or more subscriber's stations, a plurality of phonograph reproducer mechanisms, a receiver and a telephone transmitter located at said central station, a speaker and a transmitter located at each of said subscriber's stations, a two-wire metallic circuit connecting the speaker at each subscriber's station to a corresponding phonograph mechanism, electrical connections associated with each of said two-wire circuits and forming therewith a plurality of corresponding grounded half-phantom circuits each connected to the corresponding subscriber's transmitter, keying means adapted selectively to connect the central station receiver to any one of said half-phantom circuits and to condition a connection for the central station transmitter to the corresponding two-wire circuit, switching means adapted to complete said last mentioned connection, an amplifier operating the central station receiver, a volume control unit associated therewith, and switching means automatically operated with said first mentioned switching means and adapted to control said volume control unit to reduce the volume level of the central station receiver when the central station transmitter is so connected.

6. In a communication system having a central station and a subscriber's station, a phonograph reproducer mechanism, a coin register device, a signal relay, a signal lamp, a telephone receiver and a telephone transmitter located at said central station, a speaker, a transmitter and a coin receiving device at said subscriber's station, electric circuits between said stations adapted to connect the phonograph reproducer and the central station transmitter to the speaker, to connect the coin receiving switch to the coin register to actuate the latter each time said switch is actuated and to connect the subscriber's transmitter to the central station receiver, a normally open switch connected to make and break the last mentioned connection, an electric circuit for said signal relay controlled by operation of said coin register and actuating said relay, a hold-in circuit for said relay adapted to retain the same in actuated condition thereafter, a circuit for said signal lamp controlled by said relay to actuate said lamp when said relay is actuated, and a normally closed switch in said hold-in circuit automatically operable with said normally open switch to release said relay and extinguish said lamp when said normally open switch is closed.

7. In a communication system having a phonograph mechanism at a central station, and a speaker at a subscriber's station electrically connected to and operated by said phonograph mechanism, the combination of a transmitter at said subscriber's station, a receiver at said central station, electric connections between said transmitter and receiver including a normally open switch for making and breaking said connections, a coin operated switch at said subscriber's station, a signal lamp at said central station, a normally closed switch automatically operated with said normally open switch, and electrical means for actuating said lamp including a stick relay operated by actuation of said coin switch and released by opening of said normally closed switch.

LA MAR E. HAYSLETT.
FRANCIS M. SCHMIDT.