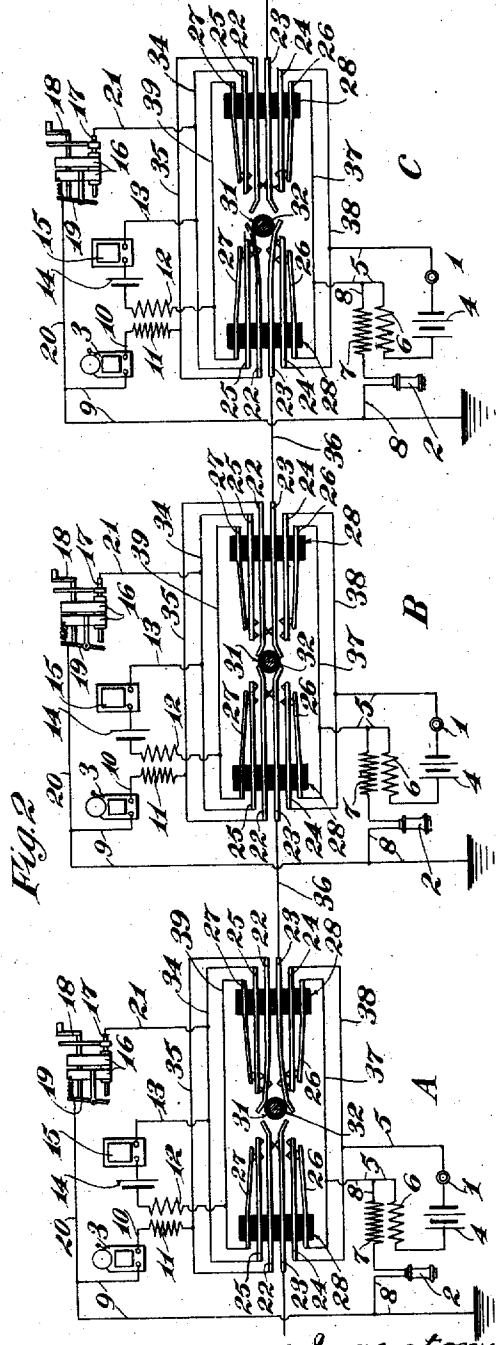
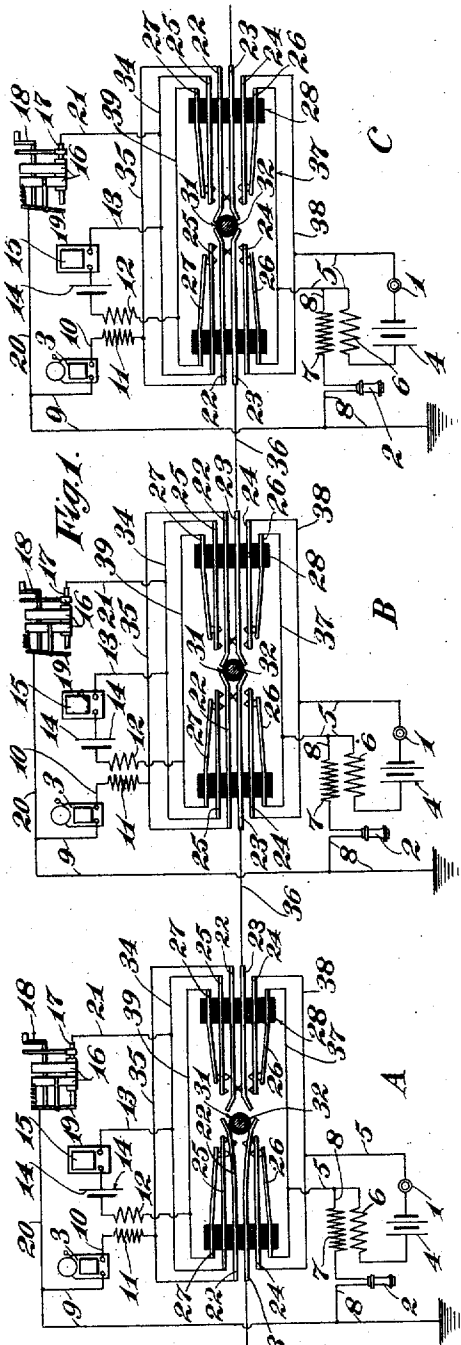


E. GOULD.
CUT-OUT TELEPHONE SYSTEM.
APPLICATION FILED OCT. 14, 1908.

Patented Dec. 6, 1910.

2 SHEETS—SHEET 1.

977,447.



Witnesses:
W. H. Souba.
Harry Opsahl.

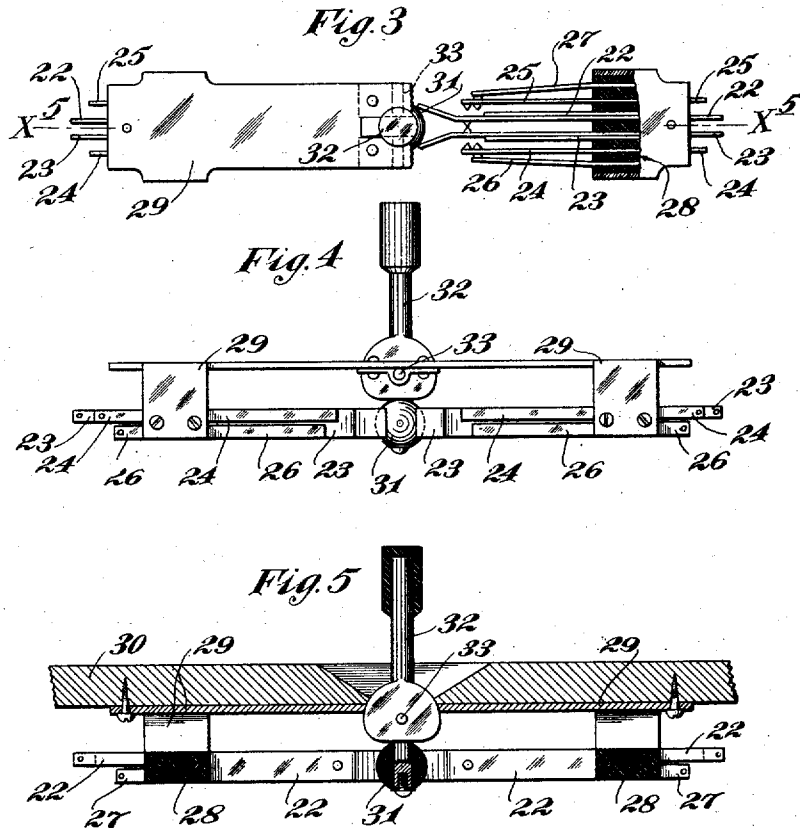
Inventor:
Edward Gould.
By his Attorneys:
Williamson & Merchant

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UNITED STATES PATENT OFFICE.

EDWARD GOULD, OF SPRING VALLEY, MINNESOTA, ASSIGNOR OF ONE-FOURTH TO SAMUEL C. PATTRIDGE, ONE-FOURTH TO WILLIAM D. INGALLS, AND ONE-FOURTH TO FAY VIALI, ALL OF SPRING VALLEY, MINNESOTA.

CUT-OUT TELEPHONE SYSTEM.

977,447.

Specification of Letters Patent.

Patented Dec. 6, 1910.

Application filed October 14, 1908. Serial No. 457,621.

To all whom it may concern:

Be it known that I, EDWARD GOULD, a citizen of the United States, residing at Spring Valley, in the county of Fillmore and State of Minnesota, have invented certain new and useful Improvements in Cut-Out Telephone Systems; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide an improved cut-out telephone system, and to this end, it consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

Particularly, this invention relates to telephone cut-out systems, wherein, by means of suitable selecting switches, the transmission line may be segregated or cut into sections and independent communication established between telephones located in non-interlapping zones or sections of the line, and in which any attempt of a person at a telephone intermediately of two telephones between which communication has been established, will result in further cutting of the line, so that it is impossible for a person that is at such intermediate telephone, to listen to the conversation which is being transmitted over the line between two other telephones of the system.

In the accompanying drawings which illustrate my invention, in what at present is believed to be the preferred arrangement thereof, like characters indicate like parts throughout the several views.

Referring to the drawings: Figures 1 and 2 are diagrammatic views showing the manner in which the invention is connected or wired in a telephone system, and illustrating the operation thereof. Fig. 3 is a plan view showing in detail one of the improved selecting switches. Fig. 4 is a side elevation of the said switch. Fig. 5 is a vertical section taken on the line $x^5 x^5$ of Fig. 3.

At each station, there is of course, the usual telephone unit, comprising the transmitter 1, a receiver 2, and electrically actuated bell 3, which parts are indicated in diagram in Figs. 1 and 2. The transmitter 1 is connected in a local circuit, which includes a battery 4, wires 5, and a primary coil 6 of a transformer 6-7, the secondary coil 7 of

which, by means of a wire 8, is connected to the ground and to the local circuit wire 5. One binding post of the bell 3 is connected by wire 9 to the ground, through wire 8, and the other binding post of said bell, is connected to a wire 10 that includes the primary coil 11 of a transformer 11-12, the secondary coil 12 of which, is connected by a wire 13 to a battery cell 14 and to an electrically actuated buzzer 15, or other secondary signaling device of suitable construction. At each station also, there is a bell actuating magneto preferably comprising permanent magnets 16 and armature 17, and an armature driving crank 18 of any suitable construction, which is arranged to automatically close the bell actuating circuit under motion or movement of said crank. As a simple way of accomplishing this result, the crank shaft 18 is mounted for endwise, as well as rotary motion, and is arranged to act upon a small spring pressed contact lever 19, that is normally held out of engagement with the shaft of the armature 17, but is adapted to be engaged therewith by endwise movement of said crank 18. The contact lever 19 is connected, by a wire 20, to the grounded wire 8, through the wire 9. The wire 21 extends from the shaft of the armature 17, and is connected in the system in a manner presently described.

Each selecting switch, as shown, comprises two sets of spring contacts 22, 23, 24, 25, 26 and 27, preferably arranged in right and left pairs. All of these contacts are rigidly secured to an insulating support 28. The two insulating bars 28 of each selecting switch are, as shown, secured to depending lugs of a metal plate 29, which in turn is secured to and located within the customary battery box 30, or to any other suitable support.

The opposing ends of the two coöperating pairs of contacts 22-23 are caused to diverge or flare, for engagement with the insulated head 31 of a switch lever 32, which as shown, works through a slot in the plate 29, and box 30, and is pivotally connected to the former at 33. In fact, usually this switch device will be applied in lieu of the standard switch hook, and an ordinary rigid receiver supporting hook will be applied to the outside of the box.

Normally, it will be noted, contact points

on the adjacent contacts 22—23, are engaged and the circuit is broken between these contacts and all of the other contacts of the two groups. It will also be understood that normally, the switch lever 32 will be held in its intermediate position, by the camming actions of the opposing pairs of contacts 22 and 23 on the head 31 of said switch levers.

By reference to Fig. 4, it will be noted that the contacts 24 and 26 are vertically offset from each other, and it should also be understood that the contacts 25 and 27 are vertically offset in the same manner, so that the said contacts are never directly engaged with each other.

Operation: For our first illustration, we will assume that a person at the left hand station, in respect to Figs. 1 and 2, and which station is designated by the letter A, wishes to call the right hand station, designated as station C. As the initial step in this manipulation, the free end of the switch lever 32 is moved toward the right, or in the direction of the station which it is desired to call; and this moves the lever head 31, toward the left or into the position shown in Fig. 1, thereby, separating the two left hand contacts 22 and 23, at station A, and forcing the same respectively into engagement with the cooperating contacts 25—27 and 24—26. The magneto crank 18, at station A, is then moved endwise so as to engage the cooperating contact lever 19, with the magneto shaft 17, thereby closing the magneto circuit 17; and then, by the proper turn of the said crank, the proper signal or bell call is sent out over the line. The circuit thus closed through the magneto, traced from the ground at station A, is as follows: through wires 8—9—20, magneto and wire 21 of said station A, to and through a part of a wire 34, to left hand contact 25 of station A; thence through left hand contact 22 and a wire 35 to right hand contact 22 of said station A, thence to right hand contact 23, and line wire 36, to left hand contact 23 of station B; thence through left hand contact 22, of station B, and through wire 35 of said latter station to right hand contact 22; thence through right hand contact 23 of said station B, and through line wire 36, to left hand contact 23 of station C; thence through left hand contact 22 and wire 35 of said station C, to coil 11 and wire 10, to the bell 3 of said station C, and from the said bell, through wires 9 and 8 to the ground. Of course, a portion of the current, in like manner, will pass through the bell of intermediate station B and through the bells of all intermediate stations. The person answering the call at station C, in order to connect the said station C into speaking and listening communication with station A, must move the lever 32 in a direction to carry its head 31 toward the left, to-wit;—into the

position as shown in Fig. 2; and the person at station A must move the switch lever 32 into position to carry its head 31 to the right, as also shown in Fig. 2. The said diagram view Fig. 2, shows the two stations A and C connected into speaking and listening communication, or in other words, so connected that conversation may be carried on between the said two stations, while all other telephones will be cut out of the line. Furthermore, the intermediate station or station B, cannot be connected in a circuit with either station A or station C without cutting a line between said stations A and C. The speaking circuit between the said two stations A and C, with the parts positioned as shown in Figs. 1 and 2, is as follows: from the ground at station A through wire 8, receiver 2, coil 7, a portion of wire 5, and through a wire 37, to right hand contact 26 of said station A; from thence through engaged contact 23 and line wire 36, to left hand contact 23 of station B; thence through left hand contact 22 and wire 35, to right hand contact 22 of said station B; thence through right hand contact 23 and line wire 36, to left hand contact 23, of station C; and from thence through left hand contact 26 and portions of wires 37 and 5, and through coil 7, receiver 2 and wire 8, to the ground at said station C. It will also be observed that the local circuits of batteries 4 of stations A and C, through cooperating transmitters 1 and primary induction coils 6, are at the same time closed through wires 5, contacts 23, 24 and 26, and through a wire 38 which connects the corresponding contacts 24. Thus, both the speaking and listening communication between the said station A and C is established. When station A is connected with station C, as shown in Fig. 2, the local circuit of battery 14 is closed through the buzzer 15, as follows: from said battery through primary induction coil 12 and local wire 39, right hand contacts 22—25 and 27 of station A, through portions of wires 34 and 13 and through the said buzzer 15 back to the said battery 14. When this circuit is closed, an alternating current is induced in secondary coil 11, at said station A, and this induced current is sent out through a portion of wire 35, through left hand contacts 22 and 23 of said station A and through that portion of the line 36 which extends to the left or in the opposite direction from the station with which speaking communication has been established. If now, a person at a station at the left of station A should set his switch lever 32 in the position shown in Fig. 2 at station A, in an attempt to establish speaking communication with a station at the right of station A, the receiver at such station, at the left, will be connected in the main line and the alternating current sent out over the line toward the left from the

buzzer 15 of station A, will vibrate the diaphragm of such receiver, thereby producing a buzzing sound indicating that the line at the right is in use.

5 Directing attention to position of the contacts of the selecting switch, as shown at station B in Figs. 1 and 2, it will be noted that the magneto circuit is normally broken on both sides of the magneto. This effectively prevents the magneto from becoming short circuited, by dust or foreign material, and furthermore, protects the magneto armature from all possibility of being burned out by lightning which frequently strikes the line. Also the arrangement above described affords an apparatus or device requiring but two hands to manipulate the same, to-wit; one hand to hold the switch lever 32 in the proper position, and the other hand to operate the crank of the magneto of the calling station.

It is further very important to note, that if a person at intermediate station B should attempt to interrupt conversation between stations A and C, the buzzer of station B, by vibration of diaphragm at station A, would notify the operator at station A of the interruption or intrusion. Furthermore, the noise always produced by connection of the receiver and transmitter with the line, would be conveyed to station C, and thereby notify the operator at said station C of such interruption or intrusion, at the intermediate station.

35 What I claim is:

1. In a telephone system having magneto circuits and having bells that are normally grounded at the several stations, a selecting switch mechanism operating normally to establish the line circuit through the several stations and to normally break the magneto circuits on both sides thereof, and movable to connect the operated magneto with bell circuits on either side of the line and to establish speaking and listening communication with telephones on either side of the line.

2. In a telephone system having a magneto circuit, selecting switches at different

stations, normally establishing the line circuit therethrough and breaking the magneto circuits on the opposite sides thereof, but movable to connect the magneto circuits with bell circuits on either side of the line, and operating under another movement to establish speaking and listening communication with telephones on either side of the line.

3. In a telephone system having magnetos at different stations, arranged to close the magneto circuits, by a crank movement, of selecting switches at different stations, normally establishing the line circuit therethrough, movable in one direction to connect the respective magnetos with bell circuits on either side of the line, and movable in another direction to establish speaking and listening communication with telephones on the same side of the line.

4. In a telephone system having a magneto circuit, selecting switches at different stations comprising two sets of contacts, and a switch lever, certain of which contacts normally holds said lever in an intermediate position and establishes the line circuit, the said lever being movable in one direction to connect the respective magnetos with bell circuits on either side of the line and movable in another direction to establish speaking and listening communication with telephones on the same side of the line.

5. In a telephone system, a buzzer, or secondary signal devices connected at different stations, and selecting switches at such stations normally establishing the line current therethrough, and arranged by movement in either one of two directions to establish speaking and listening communication with telephones on one side of the line, and to render said buzzer operative to send a current to the other side of the line, indicating in telephones at the cut-out side of the line, that the other side of the line is in use.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD GOULD.

Witnesses:

J. AARON INGALLS,
SIDNEY J. HUNTLEY.