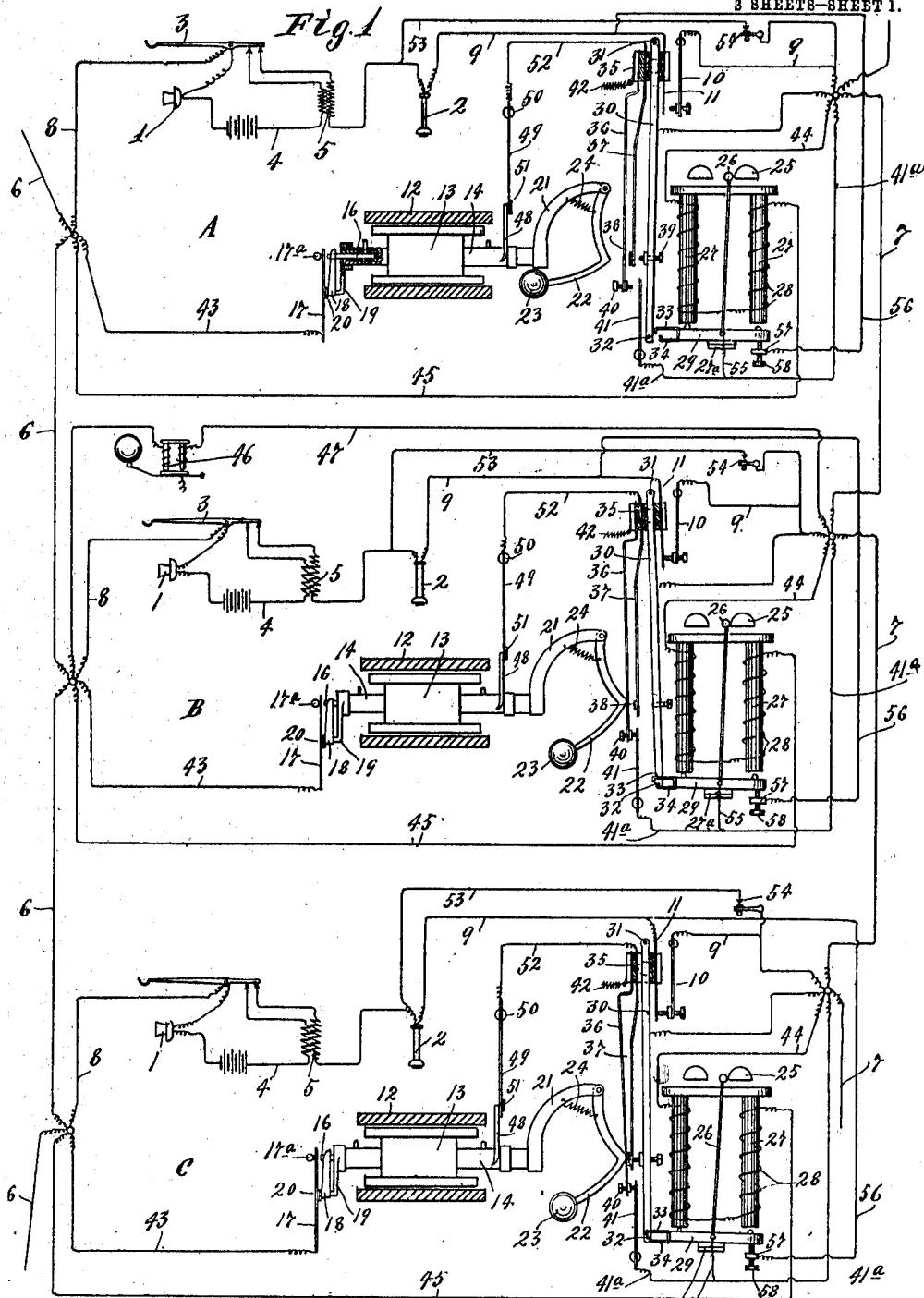


A. SWENSON.
LOOK-OUT PARTY LINE TELEPHONE SYSTEM.
APPLICATION FILED MAR. 22, 1907.

982,546.

Patented Jan. 24, 1911.

3 SHEETS-SHEET 1.



Witnesses
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3 SHEETS—SHEET 2.

Fig. 2.

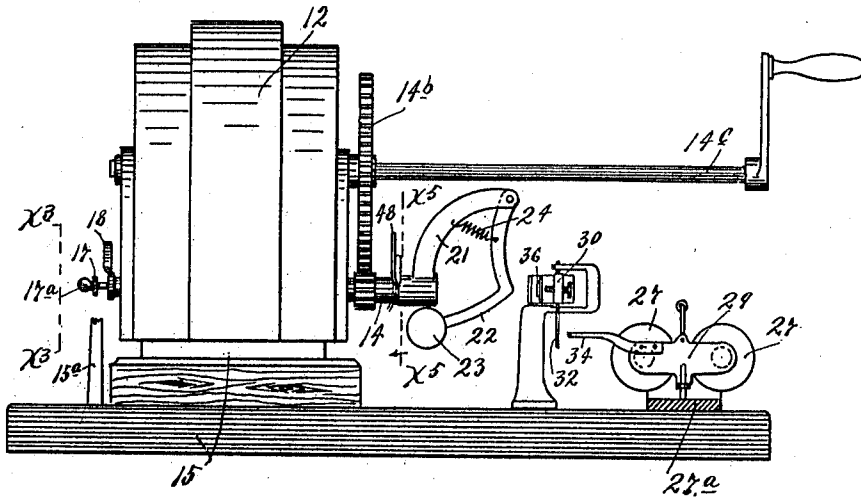


Fig. 3.

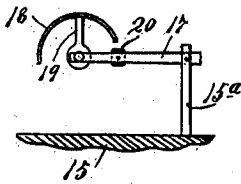


Fig. 5.

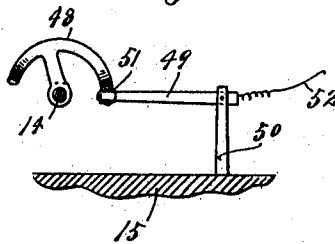


Fig. 4.

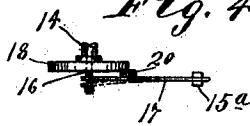
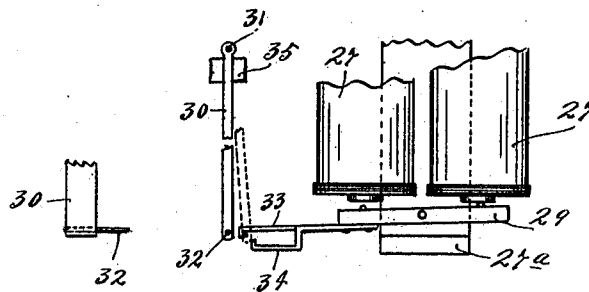


Fig. 6.



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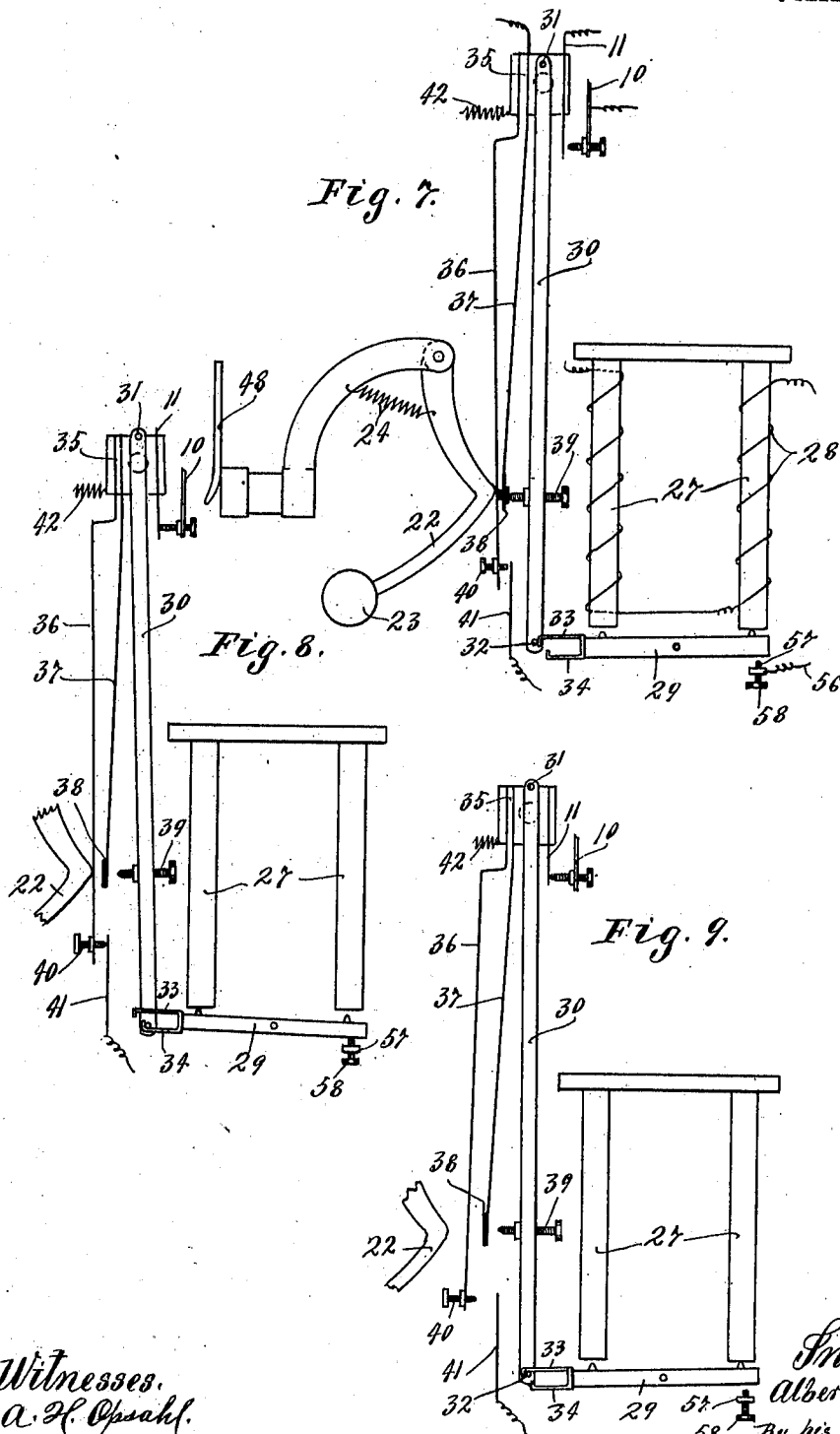
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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LOCK-OUT PARTY-LINE TELEPHONE SYSTEM.

982,546.

Specification of Letters Patent. Patented Jan. 24, 1911.

Application filed March 22, 1907. Serial No. 363,913.

To all whom it may concern:

Be it known that I, ALBERT SWENSON, a citizen of the United States, residing at Willmar, in the county of Kandiyohi and State of Minnesota, have invented certain new and useful Improvements in Lock-Out Party-Line 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 relates to party line telephone systems in which there is a plurality of telephones having individual calls; and the object of the invention is to provide an improved "lock-out" device, whereby when the calling telephone is in speaking circuit with the called telephone it is impossible to establish listening communication at any third telephone.

As a brief outline of the mechanism hereinafter described in detail the following statement of facts may be made.

This improved device is applicable both to party lines which have and those which have not a central station in the ordinary sense of the word. One of the telephones on this line, however, may, by an improved device hereinafter described, be utilized as a central or controlling station, to the extent, at least, that from this station or telephone speaking communication between two connected telephones may be broken, whenever a conversation is carried on to an excessive length of time.

Each telephone involves a magneto or dynamo, by means of which a call may be sent out over the line, that is, by giving the proper combination of rings, the party wanted may be called, and incidentally the bells of the other telephones on the system will be rung, and the party wanted in responding establishes communication with the calling telephone and locks out the other telephones of the system.

The invention consists of the novel devices and combinations of devices, hereinafter described and defined in the claims.

In the accompanying drawings which illustrate the invention like characters indicate like parts throughout the several views.

Referring to the drawings:—Figure 1 is a diagrammatic view illustrating my invention as applied to a party-line telephone system. Fig. 2 is a view in side elevation show-

ing the magneto and associated parts of one of the telephones. Fig. 3 is a detail view showing certain parts of the magneto which are directly to the right of the line marked $x^3 x^3$ of Fig. 2. Fig. 4 is a plan view of the parts shown in Fig. 3. Fig. 5 is a detail in section on the line $x^5 x^5$ of Fig. 2, some parts being removed. Fig. 6 is a plan view showing the bell magnet and armature and certain other parts, some parts being broken away, and Figs. 7, 8 and 9 are diagrammatic views, with parts broken away, illustrating different positions of the switch lever and cooperating mechanism.

In the diagram view of Fig. 1 I have illustrated a party-line comprising only three telephones, the said three telephones being indicated as entireties by the letters A, B, C, but in practice a larger number of telephones would be included in the system. Each telephone further involves as follows: a transmitter 1, a receiver 2, a hook switch 3, a battery circuit 4, and an induction coil 5, said parts being wired and connected in the usual way. One of the line wires is indicated by the numeral 6, and the other line wire is indicated by the numeral 7. The hook switches 3 of the several telephones are connected to the line wire 6 by wires 8, and the receivers 2 and secondaries of the induction coil 5 are connected to the line wires 7 by circuit wires 9. Each speaking circuit wire 9 has interposed therein a pair of contacts 10 and 11, the former of which is fixed and the latter of which is movable. Each telephone also involves a magneto or dynamo and a cooperating bell mechanism, which latter includes a switch lever and certain associated devices.

Of the parts of the magneto it is only necessary to note the permanent magnets 12 and rotary armature 13, which latter has a metal shaft 14 mounted in suitable bearings on the frame 15 of said magneto. Mounted in one end of the armature shaft 14 and projecting therefrom is a metal pin 16, that is insulated from said armature shaft and is electrically connected to one end of the coil of said armature, the other terminal of said coil being electrically connected to said armature shaft.

Secured at one end to a post 15^a on the base of the armature frame is a spring contact 17, the free end of which tends normally to engage with the projecting end of the contact pin 16 in said armature shaft, but

is adapted to be intermittently disengaged therefrom, by a segmental cam 18, shown as carried at the free end of an arm 19 secured on the adjacent end of the armature shaft 14.

5 On the contact 17 is a small plate 20 of insulating material, with which the cam 18 directly engages. This insulating plate 20 may, if desired, be faced with metal to prevent rapid wear.

10 On the free end of the spring contact 17 there is, as shown, a knob or press-button which, when pressed upon, will hold the end of said contact in continuous contact with the end of the contact pin 16, in spite of the action of the cam 18. On the other end of the armature shaft 14 is an arm 21, to which is pivoted a bent lever 22 which at its free end is provided with a ball or weight 23. A light coil spring 24 applied to said lever and arm tends to draw the weight inward or toward the axis of the armature shaft.

20 The bell mechanism, except as hereinafter specified, is of the usual construction, and involves a pair of bells 25, a bell hammer 26, cores 27, coils 28, and an intermediately pivoted armature 29, to which armature said bell hammer is secured. Under the armature 29 is a permanent magnet 27^a.

30 The numeral 30 indicates the so-called switch lever, which at one end is pivoted at 31, and at its free end is provided with a laterally-projecting pin 32, which pin is arranged to vibrate in the vicinity of one end of the vibratory armature 29. For coöperation with the pin 32 of said switch lever 30, the adjacent end of the armature 29 is provided with two oppositely turned hooks 33 and 34, the former of which is longer than the latter. Just below its pivot 31 the switch lever 30 carries a block 35 of insulating material, which constitutes a holder and carrier for the movable contact 11 already noted, and for a long depending spring contact 36 and for a depending flat spring 37. 45 The spring 37 is between the arm 30 and the spring contact 36, and at its free end carries a small plate 38 of insulating material which is adapted to directly engage with the said spring contact 36. The free end of the spring 37 is adapted to be pressed against a screw 39 in the switch lever 30. In the free end of the contact 36 is a contact screw 40 that is adapted to engage with a fixed contact 41. This contact 41 is connected by a wire 41^a 55 to the line wire 7. The switch levers 30 are yieldingly drawn toward the left by means of light coiled springs 42 see particularly Figs. 7, 8 and 9. When the armature is rotated rapidly the weighted lever 22 will be thrown outward, and its elbow portion will engage the spring contact 36 and operate thereon and on certain other parts in the manner fully set forth in the description of the operation. The spring contacts 17 are 65 connected to the line wires 6 by wires 43.

One terminal of the bell magnet coil 28 is connected to the line wire 7 by wire 44, and the other terminal thereof is connected to the line wire 6 by wire 45. The permanent magnet 27^a is connected to the cores 27 of the bell magnet, and we will assume that the extended end of said permanent magnet is positive, and hence that the cores 27 are normally negative. When a current is transmitted through the coils 28 in one direction, 75 it will tend to make one of the cores 27 more negative and demagnetize the other core; and when the current is reversed it has just the reverse effect on the two cores. Hence, under the action of an alternating current 80 the two magnets 27—28 will vibrate the armature 29 and the hooks 33—34 carried thereby. It also follows that when the current is intermittently transmitted in one direction only, under the action of the segmental cam 18 on the contact 17, it will cause said armature to be moved and held in one position, for instance, in the position shown in Figs. 1 and 8. 85

I have now described those parts which, 90 or their equivalents, are essential to the operation of the lock-out system proper, and the operation thereof is substantially as follows: We will assume that the telephone marked "B" desires to call a person at the telephone marked "C". The person at the telephone B rotates the crank shaft 14^c in the proper direction, say in the direction of the hand of a clock, and at the same time presses the free end of the contact 17 and 100 holds the same in engagement with the projecting end of the contact pin 16, so that said contact will not be intermittently thrown out of engagement with said contact pin by the action of the cam 18. In this way an alternating current is sent out over the entire line and under the action of the several bell magnets the armatures 29 of all the telephones of the system will be vibrated, and hence all of the bells will be 110 sounded. The calling party at the telephone B, after giving the proper combination of rings, by successively pressing on the push button 17^a of the spring contact 17, should release the contact 17 and continue the rotation of the armature a little after the last release of the spring contact 17, so that the bell hammers will all be left standing at one side, to-wit, as illustrated, toward the right with respect to Figs. 1 and 8. This cam 18 120 is approximately semi-circular, and is so timed for action on the spring contact 17 that it will intermittently make and break the circuit, and transmit current in one direction only. When the party at the calling station B rotates the armature of the instrument at that station, the weighted arm 22 will be thrown against the spring contact 36, thereby carrying the contact screw 40 into engagement with the contact 130

41, thereby closing the ringing circuit, and in sending out the call to all of the other telephones of the system this movement of the spring contact 36 toward the right and into the position shown in Fig. 8 moves the switch lever 30 toward the right and into the position shown in Fig. 8, so that when the said calling party continues rotation of the magneto armature, with the contact 17 released, and sends out the intermittent current in one direction, as above stated, the armature 29 at the said calling instrument will be set in the position shown in Fig. 8, and the hook 34 will engage the pin 32 of said lever 30 and hold the latter as shown in said Fig. 8. Furthermore, when the switch lever 30 is held in the position shown in Fig. 8, the contacts 10—11 are held in engagement, thereby closing the speaking circuit at the calling instrument. The intermittent current in one direction sent out from the calling station by the continued rotation of the armature, after the call has been sent out, sets the armatures 29 of all of the other instruments of the system in the said position shown in Figs. 1 and 8. The person at the station called steps to the telephone and gives the magneto armature of that instrument a backward turn, thereby sending out an intermittent current in a constant direction, but in a direction reverse to that sent out by the calling station at the completion of the call. Under this backward turn of the magneto armature at the called station "C", the spring contact 36 and switch lever 30 of that instrument are moved toward the right, and the contacts 40—41 are brought together, thereby closing the ringing circuit; and the contacts 10—11 are brought together, thereby closing the speaking circuit at that instrument. The engagement of the pin 32 of the switch lever with the hook 34, it should be noted, does not prevent engagement of the contacts above noted. The reverse direction current sent out by the backward movement of the magneto armature at the called station causes the bell magnets 27—28 to throw the armatures 29 of all of the instruments of the system into the position shown in Fig. 9. Hence, when the said backward movement of the magneto armature at the called station ceases, the weighted arm 22 and the spring contact 36 will recede, thereby breaking the ringing circuit; but the hook 33 of the instrument at the called station will catch the pin 32 of the cooperating switch lever 30 and thereby lock said switch lever in position to hold the contacts 10—11 in engagement, and thereby maintain a closed speaking circuit at the said "called station."

When under the action of the reverse current sent out from the called station, as just above described, the armature 29 of the instrument at the calling station was moved

from the position shown in Fig. 8 into the position shown in Fig. 9, the pin 32 of the switch lever 30 slipped off from the hook 34, but was caught by the long hook 33 and was thereby locked in the position shown in Fig. 9, with its contacts 10—11 in engagement, thereby maintaining the closed speaking circuit at the calling station.

The manner in which speaking communication is established between the calling and called stations has now been described. The manner in which all other instruments of the system are locked out of the speaking circuit so that they cannot be listening to the conversation going on between the two connected telephones is illustrated in Fig. 7, by reference to which it will be noted that if the weighted lever 22 be thrown against the spring contact 36 by rotation of the magneto armature of one of the locked-out instruments, the pin 32 of the switch lever 30 will be thrown against the outer portion of the long hook 33; and the movement of said lever toward the right will be intercepted in a position in which the contacts 40—41 of the ringing circuit are held out of engagement thereby preventing bells from ringing, and the contacts 10—11 of the speaking circuit are also held out of circuit at that instrument.

We will assume that the instrument at station B is to be used as a control, or in a sense as a central station, from which any two instruments that are connected in speaking circuit with each other may be disconnected or thrown out of speaking connection. To adapt this instrument at station B for the above use, the setscrew 39 in the switch lever 30 should either be removed or screwed back into an inoperative position, so that the said setscrew will not intercept the movement of the spring contact 36; but on the contrary will, when the magneto armature of this instrument is rotated, permit the weighted lever 22 to force said spring contact 36 toward the right and close the circuit between the contacts 40—41, even when the said switch lever 30 is held in the position shown in Fig. 7 by the long hook 33. Hence, it follows that the operator at this station B may at any time, by rotation of the magneto armature in either direction, send out an alternating current over the entire line, thereby vibrating the armatures 29 and ringing the bells of all the instruments of the line including the two telephones that were connected into speaking circuit. When the armatures 29 of the two telephones connected in listening circuit are vibrated, their switch levers 33 will be unhooked or released and thrown toward the left, by their springs 42, thereby breaking the speaking circuit at the said two previously connected instruments, as shown at station A in Fig. 1.

The purpose of the above noted provision whereby the operator at the station selected as a controlling station may interrupt and stop communication between two connected instruments of the line is to prevent two persons from monopolizing the line for any undue length of time. Hence, provision is also made whereby a party at any locked-out station may at any time, but without being able to break the speaking communication between two connected telephones, send a signal to the so-called controlling station which will be understood as a request to have the party at the said controlling station cut out the two connected telephones by breaking their speaking circuit. This signaling device comprises an ordinary electrically-actuated bell 46 which is located at the central or controlling station, to-wit, as assumed the station B. This bell 46 is bridged across the line from the wire 6 to the wire 7, by a wire 47. The shaft 14 of each magneto armature carries a segmental approximately semi-circular contact 48 (see Figs. 1, 2 and 5) that is electrically connected to the said shaft and to the armature coil 13. The opposite ends of this contact 48 are curved laterally in opposite directions for a purpose which will presently appear. This contact 48 operates upon a spring contact 49 which, as shown, is supported by a post 50 on the insulated base of the magneto frame 15. The spring contact 49, on one side, at its free end, is provided with a thin insulating plate 51, with which the rotary segmental contact 48 engages under certain conditions presently to be noted. The spring contacts 49 are connected to the respective vibratory springs 37 already described, by means of wires 52.

The reverse laterally curved ends of the segmental contacts 48, on the armature shaft, are arranged for such camming action on the end of the spring contact 49 that the said contact 48 will engage with the insulating portion of said contact 49, when the magneto armature is rotated forwardly, and will not close the signal circuit which includes the bell 46; but when the said magneto armature is turned backward (which is the same direction of movement that set all of the bell armatures 29 in the position shown in Figs. 7 and 9), the said rotary contact 48 will engage the metallic face of said contact 49, and thereby close the signal circuit through the bell 46 at the central or controlling station. The segmental contact 48 is so timed that it will engage the metallic face of the contact 49 while the circuit is closed between the spring contact 17 and the contact pin 16, and hence will transmit an intermittent current in one direction only. It therefore follows that the current sent out through the bell 46 at the central or controlling station for the purpose of calling

the attention of the operator at such station to the fact that a conversation is being carried on for an undue length of time, between two connected telephones, will also pass, in part, through the bell magnets of the several instruments, but will have the effect only of more firmly holding the bell armatures 29 in the said position shown in Figs. 7 and 9.

It has now been shown how the operator at the central or controlling station may be called while a conversation is going on between two connected telephones, and it has just previously been shown how the operator at this so-called central or controlling station may at any time cut two connected telephones out of speaking communication in response to a signal from a locked-out party making that request. In this system I also preferably provide additional means whereby a party at any locked-out telephone, without being able to listen to the conversation which is taking place between two connected telephones, may nevertheless talk to parties at these two connected telephones and request them to give up the line. In this way it is usually made unnecessary for the "locked-out party" requesting the line, to call up the central or controlling station in order to have the "central operator" cut out the said two connected telephones. This latter noted device comprises at each instrument or station a shunt 53 which extends from one side of the line, for instance, from the line wire 7, to a point past the receiver 2, or to a point in the speaking circuit between the receiver and the transmitter. In the shunt 53 is a push button circuit closer 54 that is normally open. When the circuit is closed through the shunt 53 and a person at that station talks into the transmitter 1 of that instrument, the transmitting circuit will be closed through the transmitter of the instrument where the interruption takes place and through the receivers of the two connected instruments; but the circuit through the receiver of the said instrument, where the interruption takes place, remains broken between the contacts 10-11 of that instrument, so that the party interrupting the conversation or requesting the line cannot hear the conversation that is taking place between the two connected instruments. Provision is also made in the system illustrated whereby when the bell armatures 29 stand in the position shown in Fig. 8 speaking circuit may be established between any two instruments of the system without requiring manipulation of the switch levers 30 and coöperating contacts 10-11; but when the system is used in this manner it will operate in the usual way, and a person at any telephone of the system may listen to a conversation which is going on between any other two of the telephones of the system. These connections are, as shown, made

as follows: A short wire 55 electrically connects each bell armature to the corresponding circuit wire 41^a, and another wire 56 connects the corresponding circuit wire 9 to a fixed binding post 57. A contact screw 58 in the binding post 57 has contact with one end of the corresponding bell armature 29 when the said armature stands in the position shown in Figs. 1 and 8, thereby normally closing the speaking circuit at this point. Otherwise stated, the speaking circuit is always closed when the bell armatures are in the positions just noted, except where broken when the receiver of the telephone is hung up on the hook 3. It will therefore be understood that when a person is called the line will remain as an ordinary line, unless the said called party in answering gives the magneto armature of his telephone a backward turn, which, as already described, will change the system into a locked-out system.

I claim as my invention:

1. In a telephone system having a multiplicity of normally open listening circuits, located at the different stations and adapted to be connected to the transmission line, of means including a vibratory switch lever, a magnet and an armature subject to said magnet and having a hooked end for action on said switch lever, whereby an operator in answering at the called telephone will lock open all of the listening circuits except the one at the telephone called, and will lock in circuit with the main transmission line the listening and speaking circuits of the calling and called telephones, substantially as described.

2. In a telephone system having connections whereby speaking and listening communication may be established between the several telephones of the system, means including a vibratory switch lever, a magnetically actuated armature operative to lock said switch lever, and a centrifugally actuated circuit closing device operative on said switch lever, the said parts so arranged that an operator in answering at the called telephone may lock out of listening communication all other telephones except the telephone at the calling station, substantially as described.

3. In a telephone system wherein the several instruments are provided in their ringing circuits with magnetos and bells, said magnetos having rotary armatures, of means whereby a backward movement of the magneto armature at the called telephone will lock out of listening communication all other

telephones of the system, except the calling telephone, substantially as described.

4. In a telephone system, the combination with magnet-actuated armatures and listening circuit and bell circuit closing contacts at the several telephones, of means independent of the receiver supporting hook switch whereby an operator at the "called" telephone in responding to a call may lock out of contact the listening-circuit-closing contacts of all other telephones, except the calling telephone, substantially as described.

5. In a telephone system, means whereby an operation at one of the telephones will lock out of listening communication all other telephones, except the telephone with which communication is desired, in combination with means whereby the telephones locked out of listening communication may be connected into speaking communication with the two connected telephones, substantially as described.

6. In a telephone system wherein the instruments at the several stations have magnetos and bells in their ringing circuits, means for rotating the armatures of the several magnetos at will, a centrifugally-actuated arm carried by the armature of each magneto, a switch lever operated by said arm and carrying contacts for closing the ringing and speaking circuits, and lock-out devices carried by the armatures of said bells and operative on said switch levers, whereby the operator at a called station may lock out of listening communication all other telephones, except the telephone at the calling station, substantially as described.

7. In a telephone system wherein the instruments at the several stations have magnetos and bells in their ringing circuits, a switch lever having contacts for closing the ringing circuits and speaking circuit, and lock-out devices carried by the armatures of said bells, means actuated by the armatures of said magnetos to throw the respective switch levers into circuit-closing positions, and means whereby at will either an alternating current or a continuous intermediate current in a constant direction may be sent out from any of said magnetos, substantially as described.

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

ALBERT SWENSON.

Witnesses:

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E. OHSBERG.