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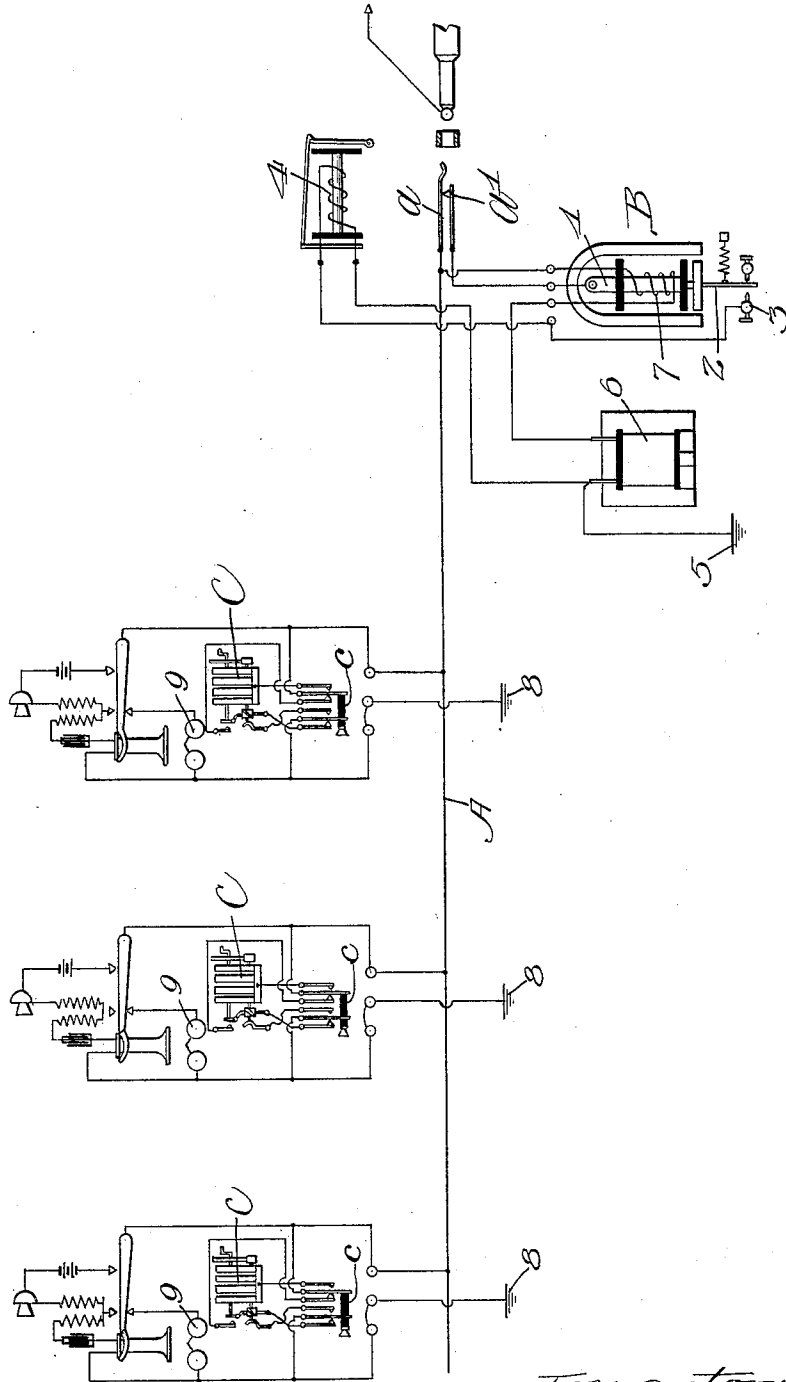
H. P. CLAUSEN.

PARTY LINE TELEPHONE SYSTEM.

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1,041,965.

Patented Oct. 22, 1912.



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UNITED STATES PATENT OFFICE.

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PARTY-LINE TELEPHONE SYSTEM.

1,041,965.

Specification of Letters Patent.

Patented Oct. 22, 1912.

Application filed March 27, 1907. Serial No. 364,827.

To all whom it may concern:

Be it known that I, HENRY P. CLAUSEN, a citizen of the United States of America, and resident of Chicago, Cook county, Illinois, have invented a certain new and useful Improvement in Party-Line Telephone Systems, of which the following is a specification.

My invention relates to telephone systems of that character in which several substations are connected on the same telephone line, arrangements of this kind being ordinarily known as party line systems.

The object of my invention is the provision of an improved arrangement by which any subscriber on the line can send current to the central station for the purpose of operating the line signal, without operating any of the bells at the different substations along the line, and whereby each subscriber can signal another on the same line without operating the line signal at the central station.

As herein disclosed, the line consists of a single wire, and each subscriber is provided with a magneto which will transmit a direct current for operating the line signal, and which can also be used for transmitting alternating currents when one subscriber desires to signal another on the same line. The line signal apparatus is adapted to respond to such direct current, but not to alternating currents. At each substation, a bell or ringer is employed for signaling the subscribers, each bell or ringer being responsive to an alternating current, but not to a direct current. In this way, each subscriber can operate his magneto to transmit a direct current for causing the display of the line signal, without danger of operating any of the bells along the line. The line signal apparatus is preferably made non-responsive to the alternating ringing currents by which the subscribers call each other on the same line, by employing an impedance coil in circuit with the relay which controls the line signal. In this way, the direct currents can pass through the impedance coil and through the relay, when a subscriber desires to call the operator; but the alternating ringing currents cannot pass through the relay. It will also be seen that the impedance coil prevents the voice currents from passing through the relay, which latter is grounded. The nature and

advantages of my invention will, however, hereinafter more fully appear.

The accompanying drawing is a diagram of a telephone party line system embodying the principles of my invention.

As thus illustrated, the party line A leads to the tip spring *a* of the spring jack at the central station. This tip spring rests normally upon a series contact *a*¹, which latter is connected to the core 1 of the line relay B. Said core is electrically connected with the armature 2, and the latter is adapted to be attracted against a contact 3. This contact 3 is, in turn, connected with a coil 4 of a drop or other line signal, and the other terminal of the said coil is connected to ground at 5. One terminal of the impedance coil 6 is connected with the conductor which thus extends to ground, and the other terminal of said impedance coil is connected to one terminal of the relay coil 7. The other terminal of the said relay coil is then connected to the line spring *a*, as shown in the drawing. When the relay B is energized by a flow of direct current in the line—which flow of current passes through the coil of the relay, thence through the impedance coil 6 and to ground at 5—a circuit is then closed from the line through the contacts *a* and *a*¹, through the core 1 and the armature through the contact 3 to the coil 4, thence to ground at 5. This energizes the coil 4 of the drop or line signal, causing a display of the line signal. In other words, the flow of direct current in the line first energizes the relay B, and this closes a parallel circuit through the line signal 4, causing a display of the latter. This direct current flow in the line may be produced by any one of the magneto generators C, which are located at the different substations along the line; for each generator or magneto when in its normal condition is adapted to transmit a direct current. The return conductor for the circuit of each magneto is through the ground between the ground connections 5 and 8, one of the latter being provided for each subscriber's telephone. At each telephone is a bell or ringer of any suitable, known or approved character. These ringers, however, are each responsive to alternating current, and do not respond to direct current. Consequently, it is necessary for the operator to project alternating currents onto the line in order to ring the

said bells or ringers. When this is done, the relay B cannot respond, inasmuch as the alternating current would have to pass through the impedance coil 6; and furthermore the contacts $a-a^1$ are open, thus preventing the operation of the line signal when the operator calls out on the line. Furthermore, this impedance coil will not permit a wasteful flow of voice currents through the relay to ground, as the impedance coil is connected to ground. With this arrangement, any subscriber can signal the operator without ringing any bell along the line, and the operator can ring any bell on the line without causing a display of the line signal. The relay has an impedance coil included in its energizing circuit, and hence only direct current can flow through such circuit.

It will be seen that when an operator's cord plug is inserted in the jack, the springs a and a^1 are thereby separated, thus opening the circuit through the line signal 4, terminating the display of the latter.

It will be understood that any suitable means can be employed for projecting the alternating ringing currents onto the line, for the purpose of ringing the bells of different substations. For example, the magnetos C can have push buttons c for changing their circuits to produce alternating currents when one subscriber desires to call another on the same line; and the operator can have any suitable kind of a ringing key for putting alternating current on the line to call the subscribers. By operating a generator and at the same time pressing the button c , an alternating current is produced. In this way, the subscribers can call each other without operating the line signal, and can call the operator without ringing each other. By means of the push buttons c , it will be seen that the selective apparatus by which the parties on the line selectively signal either the central office or the other parties on the line may be changed from one condition to another, whereby either the central office or another party on the line may be signaled by a calling subscriber, as may be desired. If the subscriber desires to call the operator at the central office, then the condition of the calling generator at the substation remains unchanged, as for this purpose direct current is required. If, however, the calling subscriber desires to signal another subscriber on the same line, then the push button c at the calling substation is operated, thus changing the condition of the selective apparatus, and causing alternating current to be supplied to the line, which current will ring the bells on the line, but will not operate the line signal at the central office. To signal central, it will be seen that the switches c remain normal. To signal each other, the different subscribers

move their switches c , thus changing the character of the signaling current. In this way the current for signaling the central operator is produced by allowing the switches c to remain in normal position while current for signaling between the different subscribers is produced by operating these switches. Broadly considered, therefore, the central operator is signaled by allowing a switch of any suitable character at the calling subscriber's station to remain normal—that is to say, to remain normal at least while the operator is being signaled; and the subscribers signal each other by operating said switches and moving the same from normal position.

What I claim as my invention is:

1. A telephone party line system comprising a line, a plurality of substations thereon, a line relay for said line, an impedance coil in circuit with said relay, means by which any subscriber on the line can cause a direct current to flow through said relay and impedance coil, a ringer at each substation, and means by which a subscriber on the line can ring with alternating current to signal another subscriber on the same line, said impedance coil preventing energizing of the relay when alternating ringing currents are projected on the line.

2. A party line telephone system comprising a line, a plurality of substations thereon, a line relay for said line, an impedance coil in circuit with said relay, a direct current generator at each substation for energizing the relay, a ringer at each substation, and means for enabling a subscriber to change the current to alternating when another subscriber on the same line is desired, said impedance coil preventing energizing of the relay when alternating ringing currents are projected on the line.

3. A party line telephone system comprising a grounded telephone line, a plurality of substations thereon, a line relay therefor, a grounded impedance coil in circuit with said relay, a direct current generator at each substation for energizing the relay over the line and to ground, a bell or ringer at each substation, and means for changing the current of said generator to alternating, said impedance coil preventing energizing of the relay when alternating ringing currents are projected onto the line.

4. A party line telephone system comprising a line relay, an impedance coil in circuit with said line relay, a line signal controlled by said relay, and means by which the subscribers on said line call each other with alternating current, said impedance coil permitting the passage of direct current through said relay, but preventing the passage therethrough of alternating current.

5. A party line telephone system comprising a line, a line relay therefor, an im-

pedance coil in circuit with the line relay, a line signal connected in parallel with said line relay and impedance coil, and normally closed jack-springs connected in circuit with
5 said line signal.

6. A party line telephone system comprising a grounded telephone line, a plurality of grounded bells on said line, a direct current generator associated with each bell,
10 a relay for said line, an impedance coil connected between one terminal of said relay and ground, a line signal controlled by said relay, means for retiring the line signal when a call is answered, and a push button

for each generator for changing the current 15 thereof to alternating to signal each other, said impedance coil permitting the direct current of the generators to pass through said relays, but preventing energizing of the relay when alternating ringing currents are 20 projected onto the line.

Signed by me at Chicago, Illinois, this 20th day of March, 1907.

HENRY P. CLAUSEN.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
