

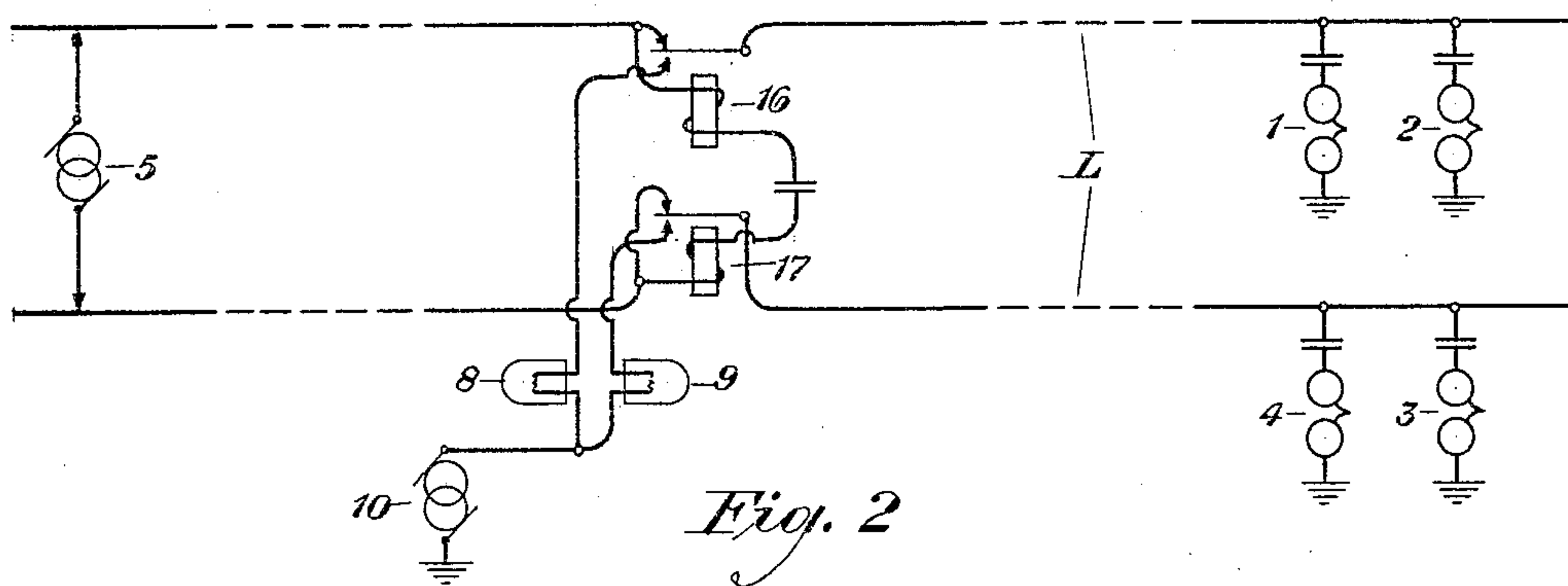
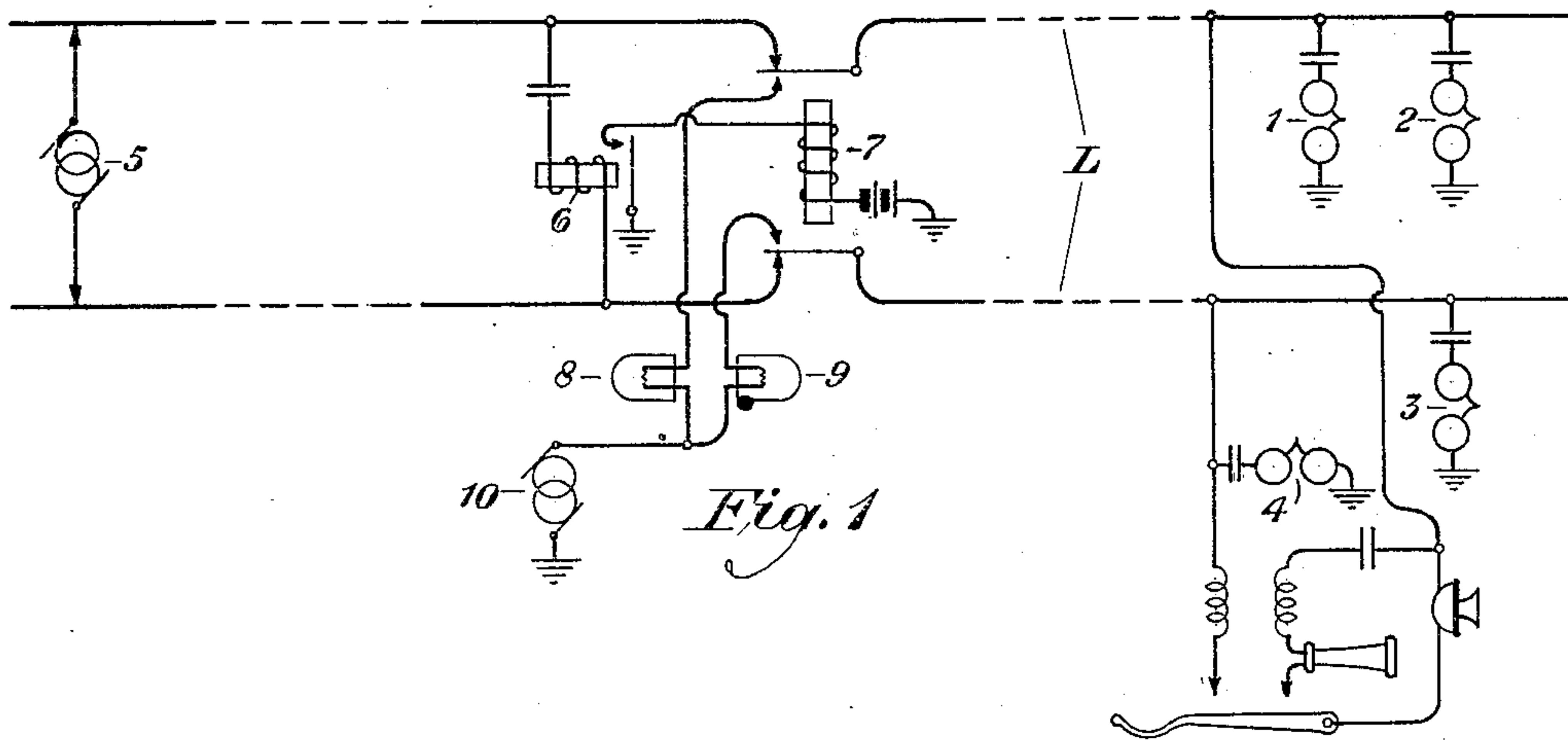
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SIGNALING SYSTEM FOR PARTY TELEPHONE LINES

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SIGNALING SYSTEM FOR PARTY TELEPHONE LINES

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This invention relates to telephone systems and more particularly to improved arrangements for signaling over party lines of such systems.

5 The arrangements of the invention are particularly adapted for use on party telephone lines which would have a number of ringers connected to the line at different stations thereon, which ringers would be operated by
10 code signals sent over the line. The arrangements of the invention provide for connecting high impedance ringers at the various stations to ground instead of using bridged ringers and also provide means for so dividing
15 the telephone line that ringing may take place over both sides of the line to ground simultaneously instead of ringing over a full metallic circuit. By thus dividing the line to provide separate paths with individual ring-
20 ers, the number of ringers per circuit is halved and the resistance of the loop over which the station is being rung is cut in two, thereby providing approximately four times as much ringing current through the ringers
25 as would ordinarily be obtained by ringing in the regular way. The arrangements of the invention will tend to improve ringing margins and performance of long multi-party code ringing lines. They will furthermore
30 increase the reliability of operation of the ringers and considerably improve the clarity of the code ringing. A further advantage of the arrangements of the invention resides in the fact that as ringers on both sides of the
35 line are rung simultaneously, if the subscriber takes his receiver from the hook during the ringing period, there is no effect equivalent to the cross ringing tendency on divided code ringing lines where only the ringers on one
40 side of the line are supposed to be rung at one time. Furthermore the code rings are not interrupted prematurely inasmuch as the ringers are not shunted by the talking circuit of the subscriber's set when the receiver is re-
45 moved from the hook. Other objects and features of the invention will appear more fully from the detailed description thereof hereinafter given.

50 The invention may be more fully understood from the following description together

with the accompanying drawing in the Figures 1 and 2 of which the invention is illustrated. Fig. 1 is a circuit diagram embodying a preferred form of the invention. Fig. 2 shows a modification thereof. Similar reference characters have been utilized to denote like parts in both figures.

In Fig. 1 is shown a party telephone line L to which a plurality of subscribers' sets might be connected. At each subscriber's set
60 would be ringing apparatus, such as the ringers 1, 2, 3 and 4. The subscriber's set with which ringer 4 is connected is shown in detail. The other sets would be substantially similar thereto. Each of these ringers would
65 be connected from the tip or the ring side of the line to ground. The various stations would be rung by sending code signals from the central office to all of the stations simultaneously. The generator 5 is shown at the
70 central office for applying alternating current code signals to the line. These signals would operate the alternating current relay 6 which in turn would operate the relay 7 in accordance with the code signals. The operation of
75 relay 7 would in accordance with the code signals connect the tip and ring sides of line L to separate circuits, each of which would include ballast lamps such as 8 and 9, and
80 thence to a circuit including a source of alternating current 10 connected to ground. Impulses in accordance with the code signals would be sent from source 10 over each side of the line L simultaneously and through the
85 individual ringers to ground.

It will be seen that in the above arrangements the current from 10 will be applied over each side of the line L to ground simultaneously and hence each side of the line will be at approximately the same potential.
90 Hence when the subscriber at a station removes the receiver from the switchhook, the code rings are not interrupted prematurely. Furthermore, compared to a system in which the ringers are bridged across the line, it will
95 be seen that in the arrangements of the invention the number of ringers will be halved and the resistance of the loop over which the station is being rung is cut in two. The arrangements of the invention accordingly
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provide approximately four times as much ringing current through the ringers as would ordinarily be obtained by ringing in the regular way.

5 In Fig. 2 is shown a modification of the arrangements of the invention. Similar reference characters have been utilized to denote like parts with respect to Fig. 1. The arrangements are substantially similar to
10 those heretofore described except that two alternating current relays 16 and 17 are bridged across the line and serve to connect the tip and ring sides of line L to the generator 10 in response to the code signals from
15 the central office.

While the invention has been disclosed as embodied in certain specific arrangements which are deemed desirable, it is understood that it is capable of embodiment in many and
20 other widely varied forms without departing from the spirit of the invention as defined by the appended claims.

What is claimed is:

1. A party telephone line connecting a plurality of subscribers' sets with a central office, ringers at each of said subscribers' sets connected from either side of the line to ground, means for applying signal currents to said line at the central office, means responsive to
25 said signal currents for dividing said telephone line, and means for applying signaling currents over the divided sections of said line and through said ringers simultaneously to ground.

35 2. A party telephone line connecting a plurality of subscribers' sets with a central office, ringers at each of said subscribers' sets connected from either side of the line to ground, means for applying signals to said line at the
40 central office, relay means connected to said line and responsive to said signals, means controlled by said relay means for connecting the tip and ring sides of said line to a local circuit, and a source of signaling current connected to said local circuit and ground.
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3. A party telephone line connecting a plurality of subscribers' sets with a central office, ringers at each of said subscribers' sets connected from either side of the line to ground, means for applying signals to said line at
50 the central office, a relay bridged across said line and responsive to said signals, a second relay controlled by said first mentioned relay, a local circuit having a source of signaling
55 current connected thereto and to ground, and means controlled by said second relay for dividing said telephone line into sections and for connecting the tip and ring conductors of one section of said line to said local circuit.
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4. A party telephone line connecting a plurality of subscribers' sets with a central office, ringers at each of said subscribers' sets connected from either side of the line to ground,
65 means for applying signals to said line at the

central office, relays bridged across said line and responsive to said signals, a local circuit having a source of signaling current connected thereto and to ground, and means controlled by said relays for dividing said telephone line into sections and for connecting the tip and ring conductors of one section of said line to said local circuit.

In testimony whereof, I have signed my name to this specification this 4th day of January, 1932.

RAYMOND C. BRADFORD.

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