

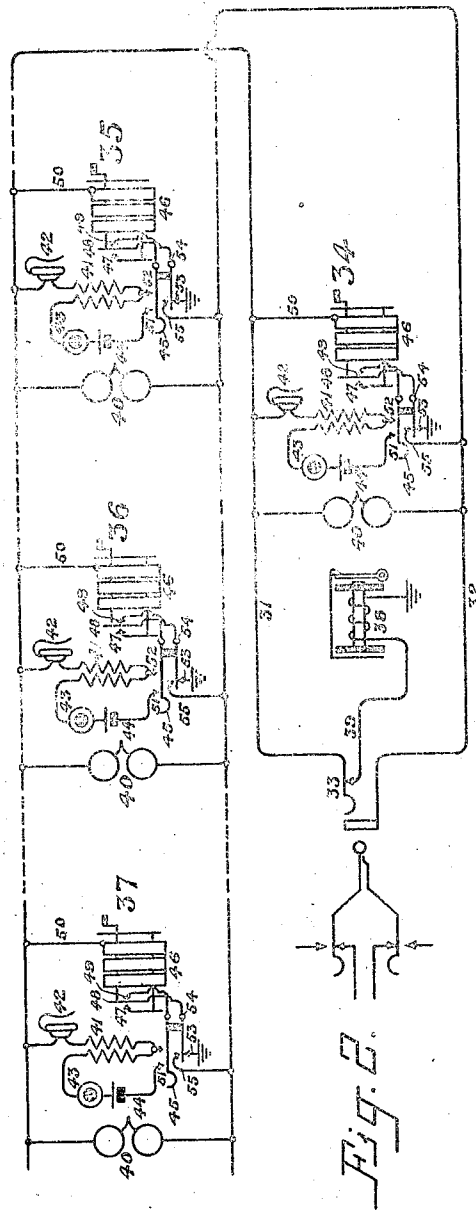
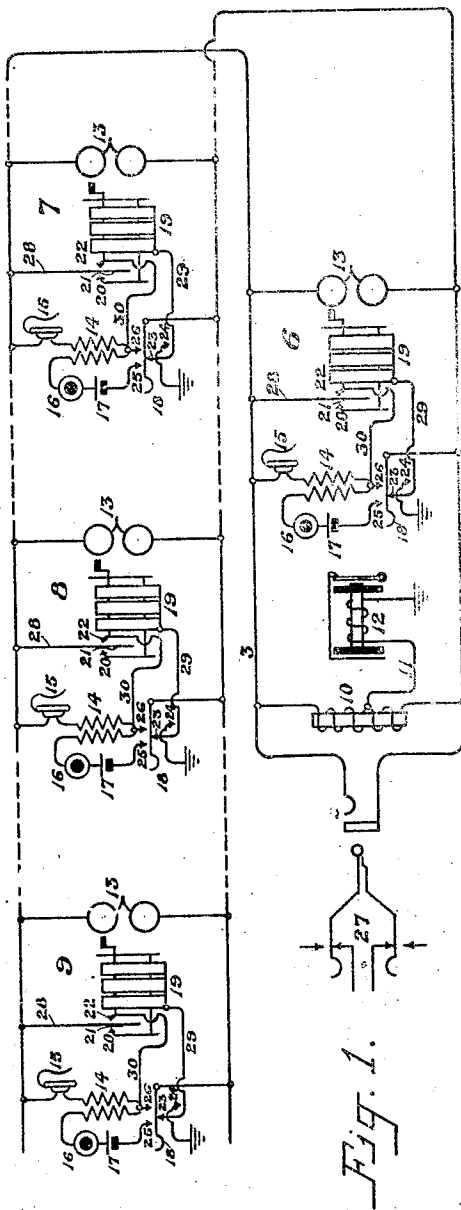
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W. R. BROWN.

NON-INTERFERING PARTY LINE TELEPHONE SYSTEM.

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NON-INTERFERING PARTY-LINE TELEPHONE SYSTEM.

No. 878,434.

Specification of Letters Patent.

Patented Jan. 14, 1908.

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To all whom it may concern:

Be it known that I, WILLIAM R. BROWN, a citizen of the United States, residing in La Fayette, county of Tippecanoe, and State of Indiana, have invented certain new and useful Improvements in Non-Interfering Telephone Party-Lines Systems, of which the following is a specification.

My invention relates to systems in which means are provided whereby subscribers on the same party line may call one another without signaling the operator at the central office, or may call the central office without operating the annunciators at the other subscribers' stations.

The object of my invention is to simplify the apparatus or systems of the above class, and particularly to provide a system in which no auxiliary apparatus such as a push-button is needed at the subscriber's station in order to change the circuit arrangement from that of signaling central to that of signaling another party.

I accomplish the foregoing object by the use of additional contacts upon the switch-hook so connected that when the hook is in one position and the generator is rotated the circuit arrangement will be such as to signal the central operator, and when the switch-hook is in its other position and the generator rotated the circuit arrangement will be such as to signal the other subscribers on the telephone line.

My invention is illustrated in the accompanying drawing, in which,

Figure 1 represents a telephone line provided with four stations connected with the central office terminal and annunciator, in accordance with one system, and, Fig. 2 represents the same with a modified circuit arrangement.

Referring to Fig. 1, the line wires 3 and 4 extend from the jack 5 to the substations 6, 7, 8 and 9. At the central office an impedance coil 10 of comparatively high resistance is bridged between the limbs 3 and 4 and has tapped from the central point of its winding the conductor 11 which leads through the coil of the drop 12 to ground. Each substation is provided with the usual bridged bell or annunciator 13, an induction coil 14, the secondary of which is connected in series with the receiver 15, and the primary of which is connected in series with the transmitter 16 and battery 17, this primary circuit being

adapted to be closed by the removal of the receiver from the hook 18, and the generator 19 carrying the three-contact springs 20, 21 and 22, which stand normally out of connection one with the other, but which are adapted to be bunched by the rotation of the generator crank. The switch-hook 18 when in its normal position connects the line 4 through contact 23 with one terminal of the generator, the other terminal of the generator being connected with the spring 20. When the receiver is removed from the hook the contact 23 moves upward sufficiently for the contact 24 to come into connection therewith before the hook makes connection with contacts 25 and 26.

In the operation of the system of Fig. 1 the operator, having inserted her plug, throws her ringing key 27 and rings all of the annunciators on the telephone line, a small part of the current also passing through the impedance coil 10, but none of it passing through the drop 12, because the operator's generator is not grounded. With this system it is necessary to use code signals in order to indicate which of the subscribers on the line is desired. Thus far the operation of the system is the same as any ordinary party line. When a subscriber desires to signal another party whom he knows to be on his own line he turns his generator crank without removing his receiver from the hook. This sends current from the generator through contact 20, the contacts 20, 21 and 22 being bunched during ringing, over conductor 28 to the line conductor 3, and from the other pole of the generator over conductor 29 and contact 23 of the switch-hook to the other line conductor 4. Thus, there is no tendency to throw the drop 12 at the central office, but the generator current will pass through all of the annunciators at the different substations, and by using the proper code the desired party may be signaled. If, however, the subscriber desires to be connected with a party whose telephone is not on this line he first removes his receiver from its hook. This connects one terminal of the generator through the contact 24 with ground, and makes connection between the contact 26 and the switch-hook 18. When the generator crank is turned and the contacts 20, 21 and 22 are bunched a short circuit is placed about the secondary of induction coil 14 and the receiver 15, and

the second terminal of the generator is connected by means of the conductor 28 and the conductor 30 and the switch-hook with both line conductors 3 and 4 such that current from the generator passes over conductors 3 and 4 in parallel through each path of the impedance coil 10, conductor 11 and the coil of drop 12, thus throwing this drop and signaling the central operator without having any tendency to ring the other annunciators on the line.

In Fig. 2 a system is shown having the line conductors 31 and 32 extending from the central office terminal 33 to the subscribers' stations 34, 35, 36 and 37. This system is provided at the central office with the drop 38 connected by conductor 39 with the line conductor 31 through normal contacts of the jack 33. It is to be understood, however, that the conductor 39 may be permanently legged to conductor 31 without in any way interfering with the operation of the system here disclosed. Each of the subscribers' stations comprises the usual annunciator 40 bridged between the line conductors, the induction coil 41, having its secondary connected in series with the receiver 42, and its primary connected in series with the transmitter 43, and local battery 44, this primary circuit being adapted to be closed by the removal of the receiver from the hook 45, and the generator 46 carrying three contact springs 47, 48 and 49, the first two of which are normally separated but adapted to be brought into contact by the rotation of the generator crank, and the second two of which are normally connected but adapted to be separated when the generator is in use. One terminal of the generator is permanently connected with line conductor 31 through the conductor 50, the other terminal being connected with the normally isolated spring 47. In addition to the usual contacts 51 and 52 associated with the hook-switch 45 are the normally closed contacts 53 and 54, the spring 54 being adapted to separate from contact 53 and make connection with contact 55 when the receiver is removed from the switch-hook.

In operation, the system of Fig. 2 is in accordance with the usual non-selective party line when the call is sent on to the line from the central office, the operator simply inserting her plug and actuating her ringing key in accordance with the code of the subscriber she wishes to signal. If one of the subscribers of this line desires connection with a subscriber on another party line the calling subscriber rotates his generator crank without removing his receiver from the hook. The circuit is then completed through the normal contacts 53 and 54, springs 48 and 47 of the generator, the armature of the generator, conductors 50, 31 and 39, and the coil of the drop 38 to ground. It is thus seen that the

drop at the central office will be thrown without signaling any of the other parties on this same party line. If, however, the calling subscriber wishes to signal a party, whom he knows to be situated on this same party line he first removes his receiver from its hook. This removes the ground connection from spring 54 of the switch-hook and connects such spring with line conductor 32 through contact 55 and includes the generator armature in a bridge between the two line conductors. At the same time the movement of spring 48 severs the connection between such spring and contact 49, such that the receiver circuit is opened and none of the generator current will be caused to pass through the receiver, which may or may not at this time be at the ear of the calling subscriber. It is thus seen that the current will not pass through the drop at the central office for the reason that there is no ground connection at any of the subscribers' stations, but that the calling party may now signal the desired substation by the use of the proper code.

It will be seen that the two systems here shown in Figs. 1 and 2 differ both in principle of operation and in the actual manner of calling, inasmuch as in Fig. 1 the receiver is left on the hook to call other subscribers on the party line, while in Fig. 2 the receiver is left on the hook to call central office. These circuit arrangements are shown and described with respect to certain details to which I do not wish to be unduly limited, it being possible to produce the same result with other circuit arrangements without departing from the spirit or scope of my invention.

What I claim as new and desire to secure by Letters Patent is:

1. In a telephone system, the combination with a party telephone line, of a generator at each substation wherewith the parties on the line may selectively signal either central office or the other parties on the line, and means depending upon the position of the switch-hook for changing the selective apparatus from one condition to another, substantially as described.

2. In a telephone system, the combination with a party telephone line having a normally grounded branch at the central office, a magnetic signaling device in said grounded branch, and an annunciator at each subscriber's station bridged between the limbs of the telephone line, a current generating device at each subscriber's station, and means depending upon the position of the switch-hook for including said generator either in a bridge of the line conductors or between the telephone line and ground, when the generator is in operation, substantially as described.

3. In a telephone system, the combination with a party telephone line, of an impedance coil bridged between the limbs of the line

at the central office, a magnetic signaling device connected between an intermediate point of said impedance coil and a third conductor, a bridged annunciator at each of the subscribers' stations, a generating device at the subscriber's station, and means depending upon the position of the switch-hook for connecting said generator in a bridge of the telephone lines or between said lines and said third conductor when the generator is in operation, whereby current may be sent either through the signal at the central office or the annunciators at the other subscribers' stations, substantially as described.

4. In a telephone system, the combination with a party telephone line, of a signal at the central office and an annunciator at each of the subscribers' stations, a generator at each of the subscribers' stations, means to direct the current of said generator through the signal at the central office when the receiver hook is in one position and the generator is rotated, and means to direct the current of said generator through the annunciators at the subscribers' stations when the receiver hook is in the other position and the generator is rotated, substantially as described.

5. In a telephone system, the combination with a party telephone line, of a signal at the central office, and an annunciator at each of the subscribers' stations, a generating device at each of the subscribers' stations, means for directing current from said generating device through the annunciators at the subscribers' stations and for excluding the current from the central office signal when the receiver hook is in one position, and means for directing the current of said generator through the central office signal

and excluding the current from the line annunciators when the receiver hook is in its other position, substantially as described.

6. In a telephone system, the combination with a party telephone line, of a signal at the central office, and an annunciator at each of the subscribers' stations, a generating device at each of the subscribers' stations, and means for directing current from said generator through the subscribers' station annunciators only when the receiver is on the hook, and means for directing the current of said generator through the central office signal only when the receiver is off the hook, substantially as described.

7. In a telephone system, the combination with a party telephone line having means whereby the subscribers may attract the attention of the central office operator without calling the other subscribers, or may call the other subscribers without attracting the attention of the central office operator, said means depending for its operation upon the position of the switch-hook at the calling subscribers' station, substantially as described.

8. In a telephone system, the combination with a party telephone line, of means at the subscriber's station for signaling either the central office or the other parties of the telephone line selectively, a switch hook, the mode of connection of such means with the line depending upon the position of the switch hook, substantially as described.

Signed by me at La Fayette, county of Tippecanoe, and State of Indiana, in the presence of two witnesses.

WILLIAM R. BROWN.

Witnesses:

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ROY C. STREET.