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PATENTED MAY 19, 1908.

T. L. WILLSON.
PARTY LINE TELEPHONE SYSTEM.

APPLICATION FILED MAY 28, 1907.

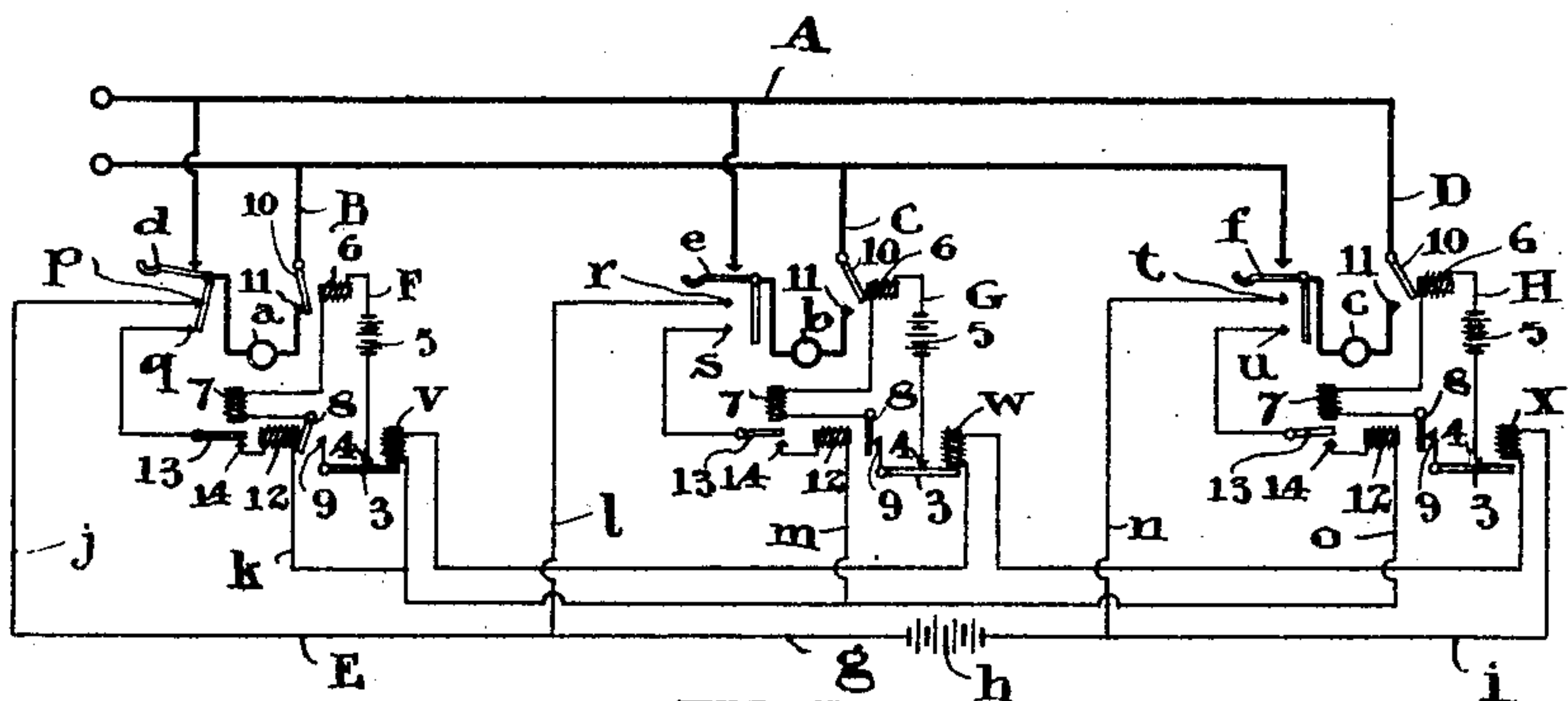


FIG. 1.

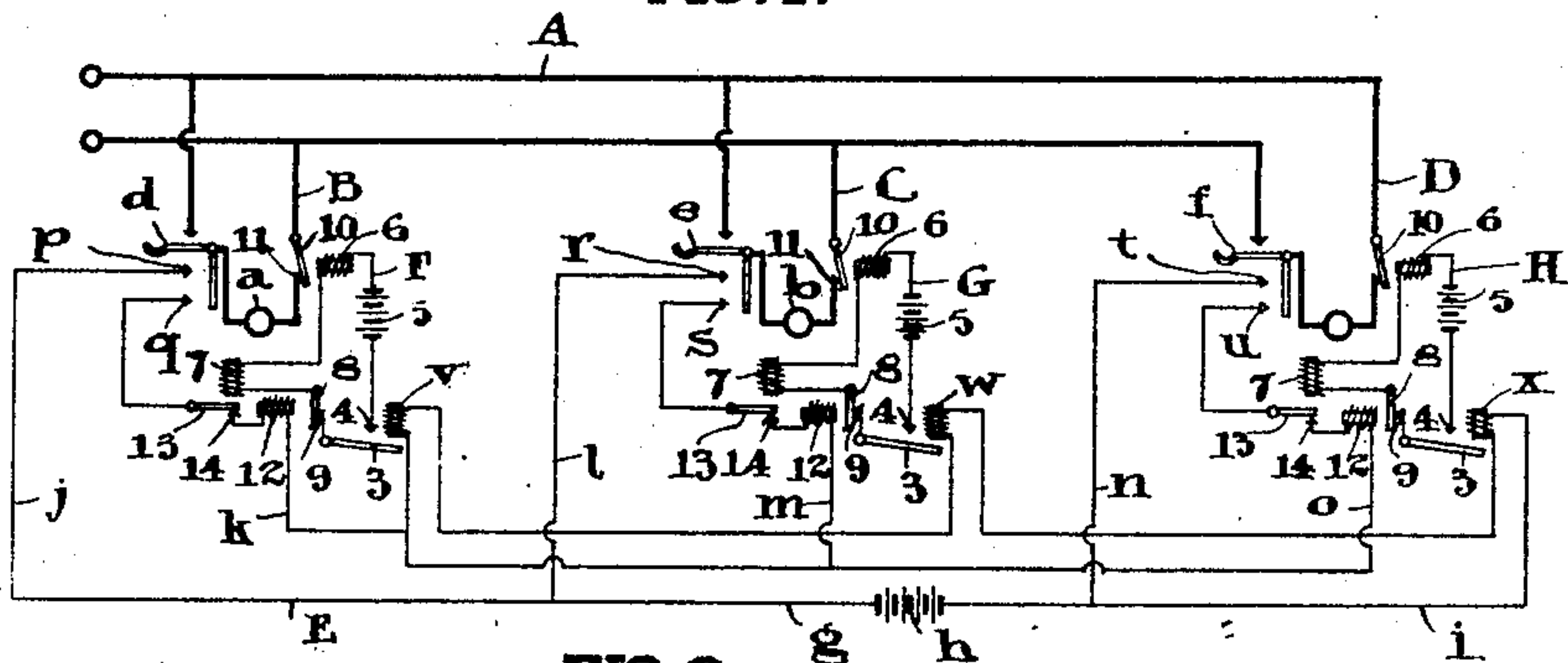


FIG. 2.

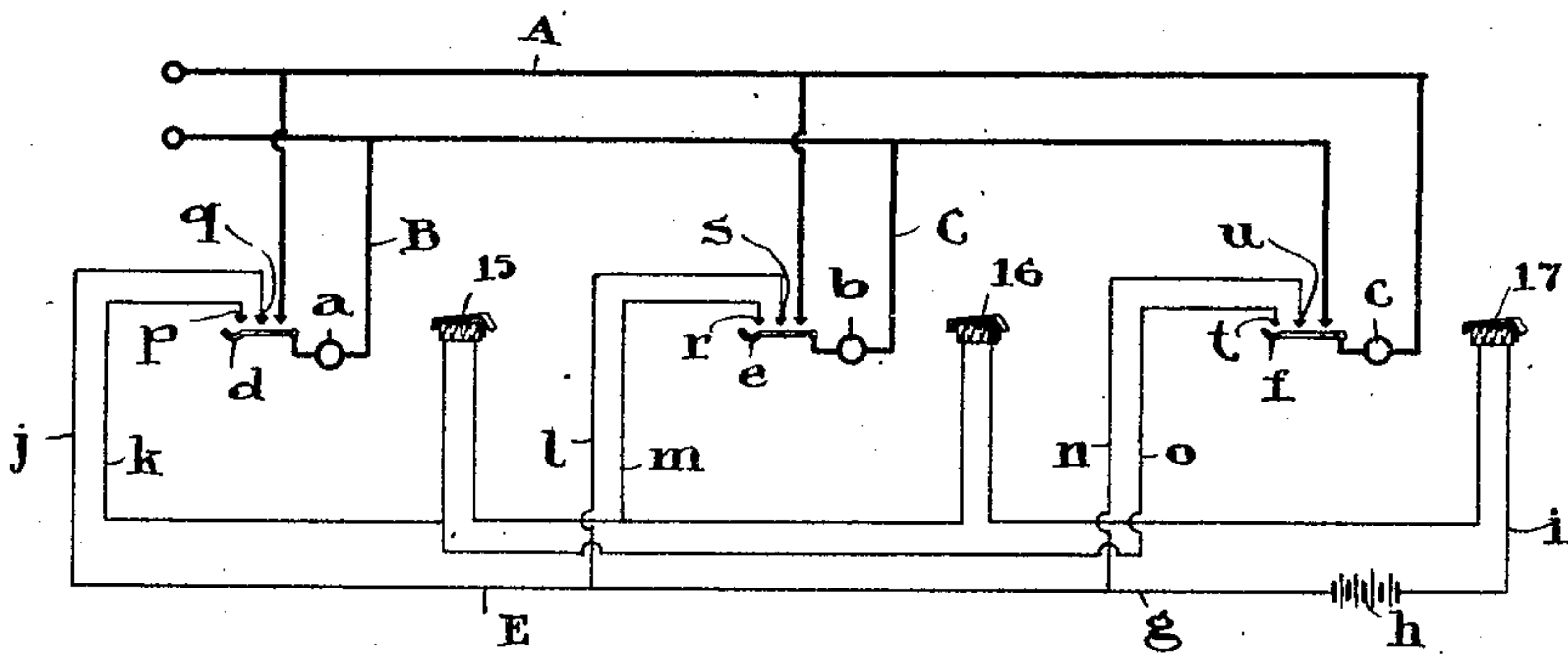


FIG. 3.

WITNESSES

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THOMAS LEOPOLD WILLSON, OF OTTAWA, ONTARIO, CANADA.

PARTY-LINE TELEPHONE SYSTEM.

No. 837,857.

Specification of Letters Patent.

Patented May 19, 1908.

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To all whom it may concern:

Be it known that I, THOMAS LEOPOLD WILLSON, of the city of Ottawa, in the county of Carleton, Province of Ontario, Canada, have invented certain new and useful Improvements in Party-Line Telephone Systems, of which the following is a specification.

My invention relates to telephone sub-stations, where a plurality of telephones are connected in multiple with the outside line, and its objects are to provide simple and effective means operated automatically by the use of any one telephone for cutting out the remainder or operating a "busy" signal before them.

I am aware that in party line systems, various forms of automatic devices are used, both to display a "busy" or like signal, and also to lock out the party telephones not in use. In these, however, the main line is made use of in whole or in part to carry the signaling current, and this necessitates a considerable amount of apparatus to prevent interference with the telephone circuits.

My invention, which is applied only to a plurality of telephones, which are located within a short distance of each other, employs an independent signaling circuit on separate conductors, and having a different source of power from that of the telephone circuits, whereby, its operation is entirely distinct therefrom. This use of the independent signaling circuit enables my device to be applied with great readiness to any system already installed, without, in any way, interfering with the internal connections thereof.

An embodiment of the invention is described more fully in detail, in the accompanying specifications and drawings.

In the drawings, Figure 1 is a diagrammatic view showing the connections with the receiver off the hook of one telephone. Fig. 2 is the same connection with all the receivers on. Fig. 3 is a diagrammatic view of the alternative form of the invention.

Referring first, to the form illustrated in Figs. 1 and 2, A is the outside line, and B, C and D are a plurality of telephone circuits connected in parallel across the same and each comprising the usual apparatus and connections employed with individual sub-stations, and which are only indicated diagrammatically by the circles *a*, *b* and *c*, the receiver hooks *d*, *e* and *f* being indicated separately, as the tilting of these, when the re-

ceiver is removed, is made use of in my system, to complete the auxiliary signaling circuit.

E is the primary auxiliary signaling circuit, which comprises a conductor *g* connected to one side of the battery *h*, and a second conductor *i* connected to the opposite side. This circuit is normally incomplete, and a plurality of pairs of leads *jk*; *lm*; *no*; lead from opposite sides of the circuit to corresponding pairs of contact points *pq*; *rs*; *tu*; each pair of which are so disposed with reference to the respective receiver hooks *d*, *e* and *f* that the tilting of any one of the hooks will connect the pair of contact points corresponding thereto, and so complete the auxiliary circuit, through the medium of the leads connected thereto.

The completion of the auxiliary signaling circuit is caused to automatically throw out the circuits of the remaining telephones not in use, and the means I show for effecting this, are substantially as follows: Connected in series in the circuit E are a plurality of electro-magnets *v*, *w* and *x*, which, when energized, are adapted to complete secondary signaling circuits F, G and H, through the medium of armatures 3 and contact points 4, in each of the circuits. Each of the circuits F and G are the same and comprise batteries 5, electro-magnets 6 and 7, armatures 8, contact points 9, armatures 3 and contact points 4, all connected in series as illustrated. Co-acting with the electro-magnets 6 are armatures 10 and contact points 11 placed in each of the telephone circuits B, C and D, whereby when the electro-magnets 6 are energized, it will lift the armature and so break the circuits B, C and D. Co-acting with the armatures 8 are electro-magnets 12 connected in series with the leads *k*, *m* and *o*, and adapted, when energized, to lift the armature 8 off the contact point 9 and so break the circuits F, G, or H, in which the armatures are located. Co-acting with the electro-magnet 7 are armatures 13 and contact points 14 connected in series, in the leads *k*, *m* and *o*, whereby, when the electro-magnet 7 is energized, it will raise the armatures and place a break in the leads.

Having now described the various parts of the system I will briefly point out the method of operation of the same: Assuming that the receiver has been taken down from the telephone in the circuit B, this will connect the contact points *p* and *q*, and so complete the

primary auxiliary circuit E, energizing the electro-magnets *v*, *w* and *x* in the circuit E and the magnet 12 in the lead *k*. The energizing of the electro-magnets *w* and *x* will raise the armatures 3 and complete the circuits G and H, which, energizing the electro-magnet 6, will lift the armatures 10 in the circuits C and D, and place breaks in these circuits. Further the energizing of the electro-magnet 7 will raise the armatures 13 in the leads *m* and *o*, and prevent any current passing therethrough to energize the electro-magnets 12 in these leads, which, if it took place, would result in the breaking of the circuits G and H, through the armatures 8 and this would allow the telephones corresponding to these circuits, to be used.

The completion of the circuit F, which corresponds to the telephone circuit B is prevented by the operation of the electro-magnet 12, which raises the armature 8 off the contact point 9 and so prevents completion of the circuit F. It will thus be seen that as long as the telephone circuit B is in use, it is impossible to use either of the telephone circuits C or D. The electro-magnets 12 in the leads serve to prevent the completion of the secondary signaling circuits, corresponding to the telephone being used, and the electro-magnets 7 co-act with the armature 13 and contact point 14 to prevent an interruption of these secondary circuits by the energizing of the electro-magnets 12 in those circuits, which are not being used.

In the alternative form of invention illustrated in Fig. 3, the main circuit A and the separate telephone circuits B, C and D are the same, as are also the circuit E, the leads *jk*; *lm*; *no*; and contact points *pq*; *rs*; *tu*. The electro-magnets *v*, *w* and *x*, are, however, replaced by drop annunciators 15, 16 and 17, or other suitable form of signaling devices, which are located near the telephones in the circuits B, C and D. When the telephone receiver corresponding to one of the circuits B, C or D is removed, it will complete the signaling circuit E through the medium of the leads and contact points corresponding to that particular telephone circuit and thus will operate all the drop annunciators 15, 16 and 17, and so place a signal at all the telephones, that one telephone is, at that time, in use.

The invention will be found of great use in business offices, where for example, two or three desk telephones are employed connected in multiple, to the same outside circuit.

The arrangement is simple in the extreme and being operated by an independent signaling circuit may be applied to any form of system already installed without in any way, interfering with the operation thereof. It depends, for its operation, on the mechanical movement of the telephone receiver

hook, and thus, in no wise, interferes with the internal connection of the telephone circuits. It will be readily understood, however, that it is not essential that the telephone hooks should be used for the completion of the signaling circuit, but in the present state of the art, this appears to be the simplest automatic movement which can be made use of. The exact connections employed to enable the signaling circuit to automatically cut out the telephone circuits not in use, are simply one form of many which might be utilized to accomplish this purpose.

While, therefore, the invention has been described, for the sake of clearness, with great particularity of detail, yet it will be readily understood that in carrying out the same, changes may be made therein, without departing from the spirit of the invention.

What I claim as my invention is:—

1. In a telephone sub-station, the combination with a plurality of telephones connected in multiple of an auxiliary independent signaling circuit, normally incompletable, a plurality of pairs of leads extending from opposite sides of the auxiliary circuit to the respective telephones, and means operated by the use of any one telephone for connecting the pair of leads corresponding thereto:

2. In a telephone sub-station, the combination with a plurality of telephones connected in multiple of an auxiliary independent signaling circuit, normally incompletable, a plurality of pairs of leads extending from opposite sides of the auxiliary circuit to the respective telephones, means operated by the use of any one telephone for connecting the pair of leads corresponding thereto, and means operated by the completion of the signaling circuit for cutting out the telephones not in use.

3. In a telephone sub-station, the combination with a plurality of telephones connected in multiple, of a primary auxiliary signaling circuit independent of the main line, automatically completed by the use of any one telephone, electro-magnets in said circuit, secondary circuits completed by the operation of the electro-magnets when energized, means operated by the closing of the secondary circuit for placing a break in each of the telephone circuits and means for preventing the completion of the particular secondary circuit corresponding to the telephone being used, as and for the purpose specified.

4. In a telephone sub-station, the combination with a plurality of telephones connected in multiple, of a primary auxiliary incompletable signaling circuit independent of the main line, a plurality of pairs of contact points corresponding to the number of telephones, separate pairs of leads extending

from opposite sides of the incompleted primary signaling circuit to the respective contact points, means operated by the use of any telephone for connecting the contact points corresponding thereto, whereby the primary auxiliary signaling circuit is completed, a plurality of secondary signaling circuits normally incompleted, means operated by the completion of the primary signaling circuit for completing each of the secondary signaling circuits, means operated by the completion of the secondary circuits for placing a break in each of the telephone circuits and means in one of each of the pairs of leads operated by the passage of a current therethrough, for automatically breaking the secondary signaling circuit corresponding to the telephone to which that lead belongs, as and for the purpose specified.

5. In a telephone sub-station, the combination with a plurality of telephones connected in multiple, of an auxiliary incompleted primary signaling circuit independent of the main line, a plurality of pairs of contact points corresponding to the number of telephones, separate pairs of leads extending from opposite sides of the incompleted primary signaling circuit to the respective contact points, means operated by the use of any one telephone for connecting the contact points corresponding thereto, whereby the auxiliary signaling circuit is completed, a plurality of secondary signaling circuits normally incompleted, a plurality of electro-magnets in the primary signaling circuits, armatures and contact points co-acting therewith to complete the secondary signaling circuits when the electro-magnets are energized, electro-magnets in the secondary signaling circuits, armatures and contact points co-acting therewith to place breaks in the circuits of the different telephones, an electro-magnet in one of each pair of leads, armatures and contact points co-acting therewith to break the secondary signaling circuits corresponding to that particular lead, when the electro-magnet therein is energized, as and for the purpose specified.

6. In a telephone sub-station, the combination with a plurality of telephones connected in multiple, of an auxiliary incompleted primary signaling circuit, a plurality of pairs of contact points corresponding to the number of telephones, separate pairs of leads extending from opposite sides of the incompleted primary signaling circuit to the respective contact points, means operated by the use of any one telephone for connecting the contact points corresponding thereto, whereby the auxiliary signaling circuit is

incompleted, a plurality of secondary signaling circuits normally incompleted, a plurality of electro-magnets in the primary signaling circuits, armatures and contact points co-acting therewith to complete the secondary signaling circuits when the electro-magnets are energized, electro-magnets in the secondary signaling circuits, armatures and contact points co-acting therewith, to place breaks in the circuits of the different telephones, an electro-magnet in one of each pair of leads, armatures and contact points co-acting therewith to break the secondary signaling circuits corresponding to that particular lead, when the electro-magnet therein is energized, second electro-magnets in the signaling circuits, armatures and contact points co-acting therewith, adapted to place a break in the leads when the electro-magnet is energized, as and for the purpose specified.

7. In a telephone sub-station, the combination with a plurality of telephones connected in multiple, of an auxiliary primary incompleted circuit independent of the main line, a plurality of separate pairs of leads extending from opposite sides of the incompleted auxiliary circuit to the different telephones, means operated by the use of any one telephone for connecting the leads corresponding thereto, a plurality of secondary signaling circuits normally incompleted, means operated by the completion of the primary signaling circuits for completing each of the secondary signaling circuits and means operated by the completion of the secondary signaling circuits for both breaking the circuits of the telephones corresponding thereto, and placing breaks in the leads extending between these telephones and the primary signaling circuits, as and for the purpose specified.

8. In a telephone sub-station having a plurality of telephones connected in multiple, the combination with the telephone receiver hooks, of an auxiliary signaling circuit normally incompleted, independent of the main line and having a separate source of power therefrom leads extending from both sides of the said circuit to the respective telephones, and means operated by the tilting of the hooks for connecting the leads corresponding to that telephone, as and for the purpose specified.

Signed at the city of Ottawa, Province of Ontario, this 19th day of May, 1907.

THOMAS LEOPOLD WILLSON.

Witnesses:

RUSSEL C. SMART,
M. C. LYON.