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TELEPHONE SYSTEM

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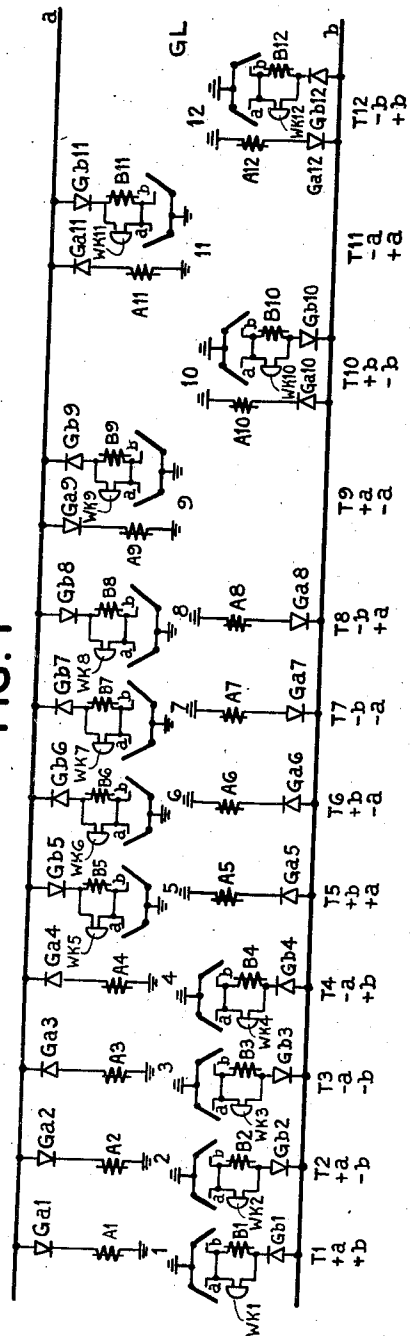


FIG. 1

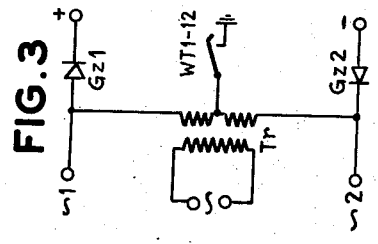


FIG. 3

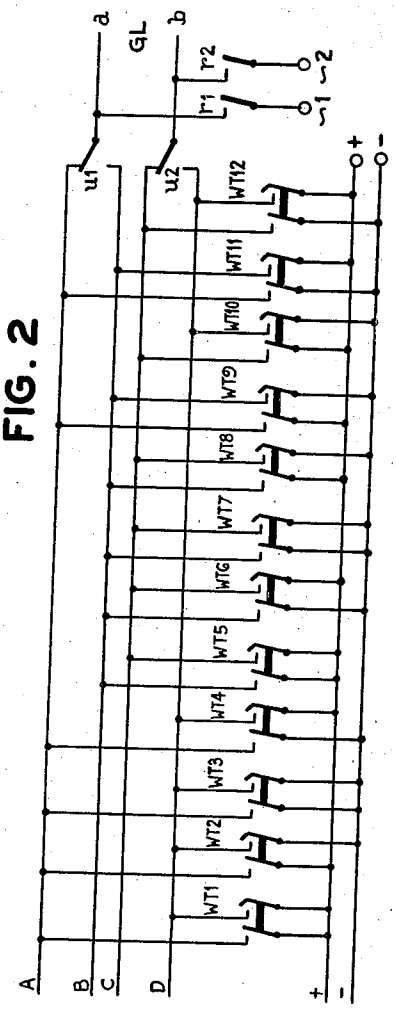


FIG. 2

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TELEPHONE SYSTEM

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3 Claims. (Cl. 179—86)

The invention relates to a circuit arrangement for remote communication systems and more especially for telephone systems with party lines, in which selection is effected by the kind of selecting current used and indicates a way in which the number of branch stations connected to a party line which can be called selectively, may be increased without the selecting devices at the branch stations becoming more complicated or occupying more space than in the known arrangements.

This is achieved in that during a selecting operation a plurality of currents are connected to the party line in succession to constitute the selecting current, the currents flowing either in the same direction over different leads or in different directions over different leads or in different directions over the same leads.

The system can advantageously be so arranged that the selecting currents produced (for example by means of a magneto) at the sending station are connected to the common line over a key set operated at this station and a switch controlling the succession of the selecting currents in a manner characterizing the wanted station. The switch possesses a number of contact positions corresponding to the particular number of selecting currents to be transmitted and over these positions the potentials determined by the selecting key contacts are connected to the party line. The control of the switch can take place automatically for example by a coupling which becomes effective after a definite number of rotations of the selecting current generator.

Alternatively the switching can be made dependent upon the calling subscriber in that the latter controls a separate switch or alternatively in that the subscriber operates for example the selecting keys in a special way, for example, depresses them further and thus brings them into another position.

At the wanted station switching means which are responsive to the direction of the current are successively connected to different leads or to the same lead of the common line and connect up the calling device under the influence of the selecting currents which are applied in succession. A plurality of switching means responsive to the direction of the current are provided at each branch station, one of which is permanently connected to the common line while a second switching means is connected to the common line when the first becomes operative, a third when the second becomes operative and so on according to the number of selecting currents.

Further details of the invention are set out in detail in the following description.

Embodiments of the invention are represented in the attached drawing but the invention is not to be considered limited to these.

Fig. 1 shows the receiving devices of a branch station connected to a party line, one of which is adapted to be selected by two successive selecting currents. Fig. 2 shows a sending device and Fig. 3 the circuit of the current generator for the selecting and ringing currents. In the twelve branch stations T1—T12 shown in Fig. 1, of which only the calling devices with which the invention is concerned are shown in detail, while the other devices can be constructed in the known manner, the calling devices at each station comprise two relays A, B each in association with a rectifier, and a bell WK. The relays are associated with the leads *a*, *b* of the party line GL in different ways at the different branch stations, thus for example in the case of the first four subscribers T1—T4 the A relays are connected to the *a*-lead, while in the case of subscribers T5—T8 they are connected to the *b*-lead. Furthermore, in the case of both these subscribers, i. e., T1—T8, only one relay is associated with each lead of the party line while in the case of the subscribers T9—T12 two relays are connected to one and the same lead. By means of the rectifier G*a*, G*b* disposed in series with each relay (A, B) the relays can only be influenced by current in a particular direction.

If now subscriber T4 for example is to be called a current impulse of negative direction is first transmitted over the *a*-lead. Consequently relay A4 at the station T4 energizes. In addition to this relay the relays A3 and A11 of the subscribers' stations T3 and T11 are connected up. All three relays operate their contacts (*a*) and thereby connect the associated relays B3 and B4 and also B11 to the *b*-lead in preparation. If now following the first impulse a second impulse is transmitted this time in the positive direction over the *b*-lead, this can operate on the relays which have been connected up in preparation only in respect of the relays B3 and B4 connected to the *b*-lead. On account of the particular direction (positive) of the selecting impulse only relay B4 however, and the bell W*k*4 at the station T4 are influenced. Relay B4 closes its contact *b* so that it is maintained operated as is also the bell W*k*4 throughout the duration of the second selecting impulse which also constitutes the ringing current. The relays A5, A6 and A10 at the stations T5, T6 and T10 which respond to this direc-

tion of current are also energized by the ringing current transmitted over the *b*-lead. False calls are not occasioned thereby since for these subscribers' stations the ringing current flows in the other lead or in the other direction.

The selection of another subscriber for example subscriber T7 occurs in a corresponding way. In this case an impulse in the negative direction is first transmitted over the *b*-lead whereupon relay A7 energizes and contacts relay B7 to the *a*-lead over its contact (*a*). The succeeding negative impulse over the *a*-lead switches on relay B7 and the bell Wk7.

If the subscriber T11 is wanted, an impulse in the negative direction is first transmitted over the A-lead and this as has already been described causes relays A3, A4 and A11 to energize. The subsequent impulses in the positive direction over the *a*-lead allows only relay B11 of the preparatorily connected relays B3, B4 and B11 to operate. The bell Wk11 is operated at the same time as relay B11. The relays A1, A2 and A9 respond to the ringing current but do not cause the associated calling devices to operate.

Fig. 2 shows the arrangement of a key set which enables the individual subscribers to be selected. This key set can be provided either at the central station of the party line or at the subscribers' stations. Its mode of operation is as follows:

If the key WT4 is operated in order to call subscriber T4 for example, negative potential is connected to the lead A and positive potential to the lead D. The negative potential connected to the lead A, since the switch U with its contacts *u1*, *u2* are in the rest position, is immediately connected to the *a*-lead of the party line GL, while the potential connected to lead D is only connected to the party line after the switching over of the switch U which takes place after a definite interval. The mode of control of the switch is not shown in the embodiment. The switch can either be made as a manually operated switch and can be switched over by the calling subscriber after a certain time, or it can be coupled to the current generator, i. e., a magneto, in such a way that after a definite number of rotations of the magneto shaft it is automatically brought into the rest or operated position respectively. Other time switching devices may be used to become operative after a definite interval after the initiation of a selecting operation and bring about the operation of the switch. The restoration of the switch takes place on the termination of the selecting operation (on the termination of the rotation of the magneto).

Fig. 3 shows a source of current which supplies the current necessary for the selection and ringing. This source of current can for example be a magneto generator which is connected to a transformer Tr from whose secondary side both alternating current can be taken and also direct current by a suitable arrangement of rectifiers. Earth can be connected to a metal tapping on the secondary side over a contact controlled by the selecting keys WT1–WT12.

In addition to the twelve subscribers' stations shown in the embodiment two further subscribers' stations can be called selectively if calling devices are provided at these stations in bridge across the two leads of the party line, these calling devices only responding to direct current in a particular direction if this is transmitted over the double line.

If the calling of these two subscribers is not to be provided for, the transmission of ringing current alone over the double line can be used for conference calls, for calling of the subscribers of the party line simultaneously. In this case a further ringing device bridged across the party line at each station is required. Therefore, by operation of a special conference call switch, which is not shown here, alternating current is transmitted over the contacts *r1* and *r2* over both leads of the party line. On this account the conference calling devices are operated at all the branch stations.

What is claimed is:

1. In a selecting system, a line having a pair of leads and having a plurality of stations thereon, a pair of relays at each station connected to the leads thereof only through unidirectional devices, a signalling device at each station also connected to a lead of the line only through a unidirectional device, sources of current of different polarity, and means for successively connecting a pair of said sources to the leads of the line to successively operate the pair of relays associated with a particular station, and for then operating the signalling device associated with that station only.

2. In a selecting system, a line having a pair of leads and a plurality of stations on the line, a first relay for each station normally connected to the particular lead of the line, a second relay at each station normally disconnected from the line and connected to a particular lead only by the operation of the first relay at that station, each of said relays responsive only to a particular polarity and means for successively connecting said sources to the leads of said line to selectively signal only a particular one of said stations.

3. In a telephone system, a party line having a pair of leads and a plurality of stations, sources of current of different polarity and a source of ringing current, a pair of relays at each station responsive to a particular source, and means for successively applying either one of said sources to first one and then another of said leads or to one of said leads, or for successively applying one of said sources to one of said leads or to first one and then another of said leads to selectively signal a particular one of said stations.

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