The present invention relates to automatic telephone systems and more particularly concerns an arrangement for deviating the calls when the group of junction lines outgoing in the desired traffic direction are unavailable.

In the proposals hitherto made for such deviations it has been necessary either to provide the intermediate exchange, over which the deviated connection is taken, with special switches for setting up connections to the desired exchange, or to withdraw for this purpose a number of switches and junction lines from the local traffic in the intermediate exchange.

Now the object of the invention is in a simple manner to enable connections to be deviated without withdrawing from the general traffic the switches in the intermediate exchange. This is achieved by providing in the exchange, over which the deviated connections are passed, a group selecting stage with one or more contact groups, which, by means of selectively connectible devices, are connected to junction lines outgoing in the wanted traffic direction from another group selecting stage in this intermediate exchange. Preferably the special contact groups are located at the last selecting stage of the intermediate exchange, so that a minimum number of lines for the local traffic of the exchange need be sacrificed for effecting the deviation. By way of example the drawings show a circuit arrangement for systems, in which connections are set up by means of impulse storers.

The Figure 1 shows diagrammatically the setting up of connections in and between three exchanges A, B and C.

In the Figure 2 are shown a preselector connected to a subscriber of one of these exchanges and a first group selector accessible over this preselector. An auxiliary switch is associated with this first group selector; when the latter is taken into use, the auxiliary switch connects to it an impulse storer, which is shown in detail in Figure 3.

The general working of the whole arrangement will first be described with reference to the Figure 1. A, B and C are three automatic exchanges, which are interconnected by means of direct junctions, of which the drawing shows the lines 1, 2, 3, 4, 5 and 6. The junction line 1 goes from the exchange A to the exchange B, the junction line 2 goes from A to C, 3 goes from B to A, 4 from B to C, 5 from C to A and 6 from C to B. When a subscriber, for example N2 of the exchange A wishes to set up a call to a subscriber of the exchange B, a first group selector LGW 1 is taken into use over the preselector VW 1 and an impulse storer is connected up in known manner. After the trains of impulses transmitted from the calling subscriber's station have been received by the impulse storer, the latter transmits the trains of impulses required for setting up the connection. The first train of impulses raises the first group selector LGW 1 to the desired level and it then hunts for an idle junction line, for example 1, going to the exchange B. In the exchange B a second group selector II GW 1 is raised to the level corresponding to the selected 1,000 digit. In this level an idle third group selector, which is not shown, is hunted for, and over it and a final selector the connection is completed in known manner.

In order to set up a connection with a subscriber of the exchange C, the first group selector LGW 1 at A is raised to the third level and for example over the line 2 is seized a second group selector II GW 2. If all the junction lines going from the exchange A to C are either engaged or out of order, circuit changes are effected at the impulse storer, whereby the connection is deviated over the exchange B and a junction line going from the latter to the exchange C. In that case by means of auxiliary devices at the impulse storer the first group selector LGW 1 is raised to the fifth level and it seizes an idle junction line, for example 1, going to the exchange B. At the exchange B the second group selector II GW 1 is raised to the tenth level, to which are connected the third group selectors, one of which is designated III.GW 1 in the drawing. This third group selector is likewise raised to the tenth level and it hunts for an idle line, which is connected over the intermediate distributing frame ZV 1 to a group of junction lines going to the exchange C.
For example, if the line 4 be free, the second group selector LLGW 3 is taken into use at the exchange C and over a third group selector connected to the bank contact of this group selector the connection is completed in known manner over a final selector. If the group of junction lines going from the exchange A to B should be engaged or out of order, a connection is set up over the intermediate exchange C. The first group selector LGW 1 of A is raised to the third level and it takes into use an idle junction line, for example 2, going to C; this line terminates at the second group selector ILGW 2. The latter is raised to the tenth level and seizes a third group selector, for example III.GW 2, to the tenth level of which over its intermediate distributing frame ZV 2 is connected the group of junction lines going to the exchange B. If the line 6 shown in Figure 1 be free, then over it is seized the second group selector ILGW 4 of the exchange B. The connection to the subscriber of B is then completed in known manner over succeeding third group selector and connector. The traffic is dealt with in a similar manner when faults occur in the groups of junction lines going in the opposite direction or between the exchanges B and C, hence a further description thereof need not be given.

The method of operating the impulse storer for setting up ordinary and devoted connections will now be described. If the subscriber N shown in Figure 2 wishes to set up a call to a subscriber of the exchange C, who is numbered 37913, he lifts his receiver and so starts up the preselector VW in known manner and it seizes an idle first group selector. Assuming that the group selector LGW is free, the following circuit is closed when the test wiper 7 of the preselector VW reaches the test contact of the first group selector; battery, winding I and II of relay T, wiper 7, winding of relay C, off-normal contact k of LGW, earth. The relay T closes its contact 8 t, which short circuits the high resistance winding I and so marks the group selector engaged in known manner. The relay C at its contact 9 c closes a circuit for the rotary magnet DM of the hunting switch DW as follows: earth, contacts 9 c, 10 t 1, winding of DM, contact 11 d m, battery, earth. At the same time as the preselector VW reaches the line of the first group selector LGW, the relay A is energized over the contacts 13 r and 13 p and the subscriber's loop. At the contact 14 e the following circuit is established for the relays E and V 1: earth, contact 14 e, wiper of relay E, winding of V 1, battery earth. The relay E closes a locking circuit for itself over its contact 15 e, which lies in parallel with contact 14 e. At the contact 16 e is prepared the circuit for positioning the succeeding switches and over

the contact 17 v 1 steering current is applied in a preparatory manner.

The hunting switch DW is moved on step by step by its rotary magnet DM until an idle impulse storer, such as that shown in Figure 3, has been found. The following circuit is then established: battery, winding I and II of relay T 1, test wiper 18 of DW, leads 33, winding of relay B (Figure 3), contact 19 a, earth. The relay T 1 at its contact 10 t 1 opens the circuit of the rotary magnet DM, thereby arresting the hunting switch DW; at contact 20 t 1 it opens the circuit of the slow relay R, which was closed at contact 21 c; at contact 22 t 1 it closes the impulse receiving circuit for the impulse storer, which extends over the wiper 23 of DW, lead 24 and over the contact 25 b to the wiper 26 of the side switch S 1. The high resistance winding I of relay T 1 is short circuited by the closing of the contact 27 t 1, thus in known manner marking engaged the impulse storer. When the wipers 28 and 29 of the hunting switch DW reach the lines 30 and 31 of the impulse storer, which are bridged by the impulse contact 32 a, the relay A 1 of the first group selector I. GW is energized over its windings I and II. At its contact 34 a 1 it short circuits the winding of relay V 1, relay VI deenergizes but this remains without effect in the present condition of the connection.

If the calling subscriber's station N now transmits the first train of impulses, the relay A is released at each impulse and its contact 35 a closes the following circuit: earth, contacts 35 a 22 t 1, wiper 23 of DW, lead 24, contact 25 b, wiper 26 of S 1, rotary magnet Dr of the impulse receiving device de, winding of the slow acting relay V, battery, earth. The rotary magnet Dr moves on three steps the wipers 36, 37 and 38 of the receiving device de, because the first train of impulses transmitted by the subscriber's station consists of three impulses. At the end of the first train of impulses the opening of the contact 35 a for some time interrupts the circuit of the relay V, hence the latter falls back and opens the circuit of the rotary magnet Dk 1 of the side switch S 1, which was closed over the contact 39 a. The magnet Dk 1 moves the wiper 26 onto the second contact. The transmission of the second train of impulses consisting of seven impulses energizes seven times the rotary magnet Dk connected to the second contact of the side switch S 1 and the magnet brings the wiper 40 of the impulse receiving device de into contact with the seventh contact of the contact row wiped by it. At the end of the train of impulses the relay V again falls back and the wiper 26 of S 1 connects the impulse circuit to the third bank contact, to which the rotary magnet Dh is connected. The third train of impulses, comprising 9 impulses, rotates the wiper 41 of the impulse receiving device de onto its ninth con-
tact, and at the end of the train of impulses the wiper 26 of the side switch S 1 is connected to the rotary magnet Dz. Hence the next train of impulses sets the wiper 42 of the impulse receiving device x onto the first contact, and the last train of impulses sets the wiper 45 of the impulse receiving device e onto its third contact by energizing the rotary magnet Dz.

At the end of the last train of impulses, when the rotary magnet Dz of S 1 falls back, the relay F is energized over the wiper 44. The relay over its contact 45 f and over the contact 46 e energizes the relay H, which connects up the rotary magnet Dabs over its contact 47 h and over the interrupter U. The wipers 48 and 49 of the switch ABS are now moved on step by step until the wiper 48 reaches its fourth contact, which over the intermediate distributing frame ZV and over the contact 50 g is connected to the third contact of the contact row of the receiving device at wiped over by the wiper 36. The following circuit is now closed for the winding 1 of the relay P: battery, winding I of P, wiper 48, contact 51 of the switch ABS, contact 52 of the intermediate distributing frame ZV, winding 1 of relay N contact 50 g, contact 53 of the intermediate distributing frame, contact 54 and the wiper 36 of the receiving device at, wiper 55 of the side switch S 2, earth. The purpose of the relay N which is also energized in this circuit will be explained later.

The relay P at its contact 56 p opens the circuit of the impulse relay J, which was energized over the contact 57 dabs and over the contact 58 e each time the rotary magnet Dabs was operated. Hence the relay J was energized at each step of the switch ABS and at its contact 59 j it interrupted the above described circuit for the impulse receiving relay A 1 of I.G.W. In this manner the relay A 1 was released three times and repeated in known manner the received impulses to the not shown lifting magnet of the group selector. When the relay P operated at the same closed a locking circuit for its winding 11 over its contact 59 p and over the contact row wiped over by the arm 49. The contacts in this row are all interconnected, so that it can comprise a contact segment. The circuit of the rotary magnet Dabs however remains closed over the contact 47 h, hence the wipers 48 and 49 of the switch ABS are moved on step by step until the wiper 49 reaches the normal position and the slow acting relay K is energized over the contacts 60 f and 61 i. Relay K at its contact 62 k closes a circuit for the relay L, which is slightly slow acting.

The relay L at its contact 60 k opens the circuit of the relay II and at contact 61 i it opens the circuit at operation of contact 47 h the rotary magnet Dabs is disconnected, while the relay K only opens its contact 62 k after a little time has elapsed and then causes the relay L to fall back. During the time the relay L takes to fall back, the following circuit is closed for the rotary magnet De 2 of the side switch S 2: earth, front contact 63 l, back contact 64 k, bank contacts and wiper 65 of S 2, self interrupting contact 66 da 2, winding of the rotary magnet Dz 2, battery and earth. The rotary magnet Dz 2 is energized and brings the wipers 65 and 66 of the side switch S 2 into contact with its second bank contacts. The rotary magnet Dz 2 of the side switch S 2 is now energized over the contact 67 a and the wiper 65, hence the side switch reaches the position 3, in which over the contact 68 y the rotary magnet De 2 is again energized. Therefore the wipers 55 and 65 of the side switch S 2 reach the fourth bank contact of their levels.

In the meantime the relay L has fallen back and at its contact 46 l it has energized the relay II, which again connects up the rotary magnet Dabs. The switch ABS is now moved on step by step until the wiper 48 reaches the seventh contact. In this position the following circuit is closed for the winding 1 of the relay P: battery, winding I of P, contact 69 of ABS, contact 70 of the receiving switch t, wiper 40 thereof, wiper 55 of the side switch S 2, earth. The relay J has been energized seven times, hence seven impulses have been transmitted to the receiving relay A 1 of the first group selector. It should also be mentioned that after the first group selector I.G.W has been raised to the desired level, it is rotated over the bank contacts thereof until an idle succeeding switch (for example I.G.W 2 in the exchange C) has been found. In that case the relay P 1 was operated in the following circuit: battery, contact 71 e, windings I and II of P 1, wiper 72 of I.G.W, winding of relay C 1, of the seized line, earth. The relay P 1 at its contacts 73 p 1 and 74 p 1 closes the impulse and steering circuit for positioning the succeeding group selector over the wipers 75 and 76. Relay P 1 at its contact 77 p 1 short circuits its high resistance winding II. On operating, the relay C 1 closed the contact 78 c 1 for the purpose to be described hereafter.

Each time the relay A 1 falls back it closes the following circuit for positioning the succeeding group selector: earth, contacts 79 a 1, 16 e and 73 p 1, wiper 75 and upper speaking lead to the impulse receiving relay of the succeeding group selector. At the same time at each impulse received by the relay A 1 the contact 34 a 1 removes the short circuit from the winding of the relay V 1, which is then operated and applies steering current for the succeeding group selector over its contact 17 e 1 and the contact 74 p 1 as well as over the upper speaking lead, the relay V 1 is again short circuited at the end of each impulse, but being short circuited, it is rendered slow act-
ing and remains in its operated position during the short pause between the individual impulses of current. The positioning of the succeeding switches takes place in a known manner, so that a detailed description thereof does not concern the present invention.

When the switch ABS has again completed a rotation, the rotary magnet Ds 2 of the side switch S 2 is energized over the contacts 63 l and 64 k, and the side switch is moved on one step. The other trains of impulses comprising 9, 1 and 3 impulses takes place in similar manner to that just described for the first two trains of impulses and the connection is completed in known manner. At the end of the last train of impulses the side switch S 2 reaches the position 7, in which the relay O is energized over the wiper 55. The relay at its contact 19 o interrupts the test circuit of the hunting switch DW, thereby causing the relays B and T 1 to fall back. At the same time a circuit for the rotary magnet DS 1 of the side switch S 1 is closed at the contact 50 a, thus over the contact 81 o is operated the rotary magnet Ds 2 of the side switch S 2. The side switch S 2 is brought back to its normal position, thereby opening the circuit of the relay O. The opening of the contact 80 o causes the rotary magnet Ds 1 of the side switch S 1 to fall back, hence this also returns to its normal position. Thereby is opened the circuit of relay F, which at its contact 45 f prevents the relay H being again operated after relay L has fallen back. Upon the operation of the relay O the relay T 1 was by force released and at its contact 22 t 1 it opens the circuit of the rotary magnet of the receiving device of the impulse storer, at its contact 20 t 1 it closes a circuit for the relay R and at contact 10 t 1 it prepares the circuit for the rotary magnet DM of the hunting switch DW once more. This circuit has already been opened at contact 9 e when the group selector was positioned, because the relay C is released when the off-normal contact k is opened at the first step of this switch, but the blocking circuit of the first group selector is maintained over the resistance W and the contact a of the not shown release magnet of LGW. The relay R opens its contacts 12 r and 13 r, hence the relay A falls back and closes its contacts 82 r and 83 r, thereby the relay A 1 is maintained energized over the line loop of the calling subscriber's station N. At the same time the contacts 84 r and 85 r open the impulse circuit of the impulse storer for the trains of impulses to be transmitted.

The arrangement shown in Figures 2 and 3 for deviating calls will now be described in detail. If all the junction lines going to the exchange C and accessible over the first group selector LGW be engaged, the contacts 78 e 1 and the other contacts designated by e 1 belonging to other group selectors having access to the same group of junction lines will have been operated, hence the relay G is operated. This relay can also be manually operated over a key US, if the cable going to the exchange C is out of order. When the relay G operates, it opens the contact 50 g and closes the contacts 86 g, 87 g and 88 g. If the subscriber N now wishes to set up a connection with the same subscriber No. 37,913 of the exchange B, then after the receiving devices st, t, A, and c of the impulse storer have been positioned, during the first rotation of the switch ABS the relay P is not energized until the contact 89 is reached, the energizing circuit extending over the contact 90 of the intermediate distributing frame ZV, contact 86 g, contact 53 of ZV, contact 54 and wiper 36 of st and over the wiper 55 of the side switch S 2. Hence the relay J transmits five impulses to the relay A 1 of the first group selector LGW, raising the latter to the fifth level, and it then hunts in this level for an idle junction line going to the exchange B (Figure 1). At the end of the first rotation of the switch ABS, when the side switch S 2 reaches its position 2, the relay X is energized over the wiper 87 of the receiving device st and over the contact 87 g. The relay X closes its contact 91 w and so prevents the side switch moving beyond its position 2, hence only at the next rotation of the switch ABS is it arrested on its tenth contact, because this is directly connected to earth over contact 93 n and wipers 88 and 55. Therefore 10 impulses are transmitted, which raise a second group selector II.GW 1 (Figure 1) to the tenth level. At the end of the rotation of ABS the side switch reaches its position 3, owing to its magnet Ds 2 being energized over the contacts 63 l, 64 k and 91 w; in this position the relay Y is energized over the wiper 83 of the receiving device st over the contact 88 g. The relay opens its contact 68 y and closes its contact 92 y, thereby preventing the third position being jumped over at the side switch S 2. Now ten impulses are again transmitted, because the relay P is operated only at the last contact of the level wiped over by the wiper 48. Thereby the third group selector III.GW 1 in the exchange B is raised to the tenth level and it then hunts for an outgoing line connected to a junction line going to the exchange C over the intermediate distributing frame ZV 1 (Figure 1). The switches in the exchange C are then positioned on the line of the wanted subscriber in accordance with the trains of impulses transmitted by the impulse storer in the manner described above.

A short description will now be given of the method of operation of the relay N mentioned above. If there is only one line idle leading from the first group selector in the desired direction, after the setting of this se
lector which will be effected on the first rotation of the switch ABS relay C1 associated with the seized line will be energized and over its contact 75 C1 and similar C1 contacts which were closed on the seizure of the remaining lines leading in this direction will complete a circuit for relay G.

As already described above, on the first rotation of the switch ABS the relay N will be energized over its winding 1 and will complete a locking circuit for itself for its winding 2 over its contact 95 N this circuit extending over the contact 965. At contacts 93 N and 94 N the completion of circuits for the relays X and Y is prevented so that no transmission of additional impulses can take place. When all the trains of impulses necessary for the establishment of the connection have been sent out from the register, relay O will be energized as previously described, and will open the circuit of the relays B and T1, thereby at contact 965 the holding circuit of relay N is opened and it falls away. If in the meantime another impulse storer has been connected up over the hunting switch for the establishment of a connection in the same direction, then in this impulse storer contact 507 is opened and contact 867 is closed, so that the relay N cannot operate and the connection is routed through another exchange.

What is claimed is:
1. In an automatic telephone system including a number of exchanges interconnected by trunks, a device for automatically deviating calls between two exchanges through a third exchange in case all of the trunks connecting the two exchanges are busy, and
2. In a telephone system, a register sender normally operable in a given manner, means automatically operated under predetermined conditions to cause said register sender to operate in a different manner, and additional means manually operated for causing said first named means to operate regardless of the happening of the predetermined conditions.
3. In a register sender, means for registering groups of digit impulses, means for transmitting groups of impulses corresponding to the impulses registered, means effective under predetermined conditions for automatically changing the number of impulses corresponding to one of the digits, and for transmitting additional groups of impulses.
4. In a telephone system, a plurality of groups of trunks, a register sender, means for conditioning said register sender to transmit a number of impulses corresponding to a desired group of trunks, means effective upon all of the trunks in the desired group becoming unavailable for automatically conditioning the register sender to transmit a different number of impulses, and manually operated means for rendering said last named means effective regardless of the busy condition of the trunks.
5. In a telephone system, a plurality of groups of trunks, a register sender, means for conditioning the register sender to transmit a number of impulses corresponding to a desired group of trunks, means effective upon all of the trunks of the desired group becoming busy for automatically conditioning the register sender to transmit a different number of impulses, manually operated means for rendering said last named means effective regardless of the busy condition of the trunks, and means for transmitting extra groups of impulses when said second named means has operated.
6. In a telephone system, a plurality of offices, an automatic switch, a plurality of groups of trunks accessible to said switch, each group of trunks terminating in a different office, a sending apparatus conditioned for transmitting impulses to direct said switch to a desired group of trunks, means controlled in accordance with traffic conditions in the desired group of trunks for altering said sending apparatus before it starts so that it will send a different series of impulses to direct said switch to a different group of trunks, and means effective when said first named means operates for causing the sender to operate automatic switches in the office terminating the selected group of trunks to extend a trunk of said group to the desired office.
7. In an automatic telephone system including a number of exchanges interconnected by trunks, means including an impulse storing device for storing and later transmitting groups of digit impulses representing a called subscriber's number, means in the device effective if the call is for a subscriber in a different exchange and all of the trunks between the two exchanges are unavailable to cause the impulse storer to transmit a number of impulses required to extend a connection to the desired exchange, and to cause the device to transmit additional impulses, automatic switches in the third exchange controlled by said additional impulses to extend
9. In a multi-office telephone system, a register sender for registering a telephone number and for sending digit impulses to trunk the call to its destination, and means effective when all the trunks leading directly to the desired office are busy for altering said sending apparatus before it starts so that it will transmit impulses to route the call to its destination over a new inter-office trunk path by way of an intermediate office.

10. In a telephone system, three offices, trunks connecting each office with the other two, a register sender in one of said offices for recording and sending digit impulses corresponding to a desired office, means in each office controlled by the register sender for extending a connection to either of the other two offices, means effective when all the trunks leading to the desired office are unavailable for altering said register sender before it starts so that it will directly control the means in its office to extend a connection to the third office and then to directly control the means in the third office to extend a connection to the desired office.

11. In a telephone system, a first office, a second office, a third office, trunks connecting each office with the other two, a register sender in the first office normally effective for routing calls from the first office to the second office by way of trunks connecting the two offices, means effective when all of the trunks connecting the first office with the second office are unavailable for preconditioning the register sender to route calls intended for the second office to the third office, and means in the third office controlled by the register sender for extending the calling connection from the third office to the second office.

12. In a telephone system, three offices, trunks connecting each of the offices with the other two, a register sender in the first of said offices normally set to translate the office designation of said second office into a code which will trunk a call over a trunk line connecting the two offices, and means effective in case all of the trunks connecting the two offices are busy for changing said code before transmission so that the call will be trunked over a trunk line connecting the first and third offices.

13. In an automatic telephone system including a number of offices wherein connections between subscribers are established by means of sequentially operated automatic switches, trunks leading from switches of a certain order in each office to the other offices, and multiple connections to said trunks from other switches of a higher order.

14. In an automatic telephone system including a number of offices wherein connections between subscribers are established by means including sequentially operated automatic selectors, trunks leading from selectors of a certain order in each office to the other offices, and multiple connections to said trunks from the last of said sequentially operated selectors.

15. In a register sender, means for registering groups of impulses corresponding to dialed digits, means normally effective for transmitting certain groups of impulses determined by the digits registered, a relay, means controlled by said relay for adapting said second means for transmitting different groups of impulses, and manually controlled means for operating said relay.

16. In a register sender, means for registering groups of impulses corresponding to dialed digits, means normally effective for transmitting groups of impulses corresponding to the digits registered, a relay, means controlled by said relay for adapting said second means for transmitting groups of impulses differing from the digits registered, and manually controlled means for operating said relay.

17. In a telephone system including a plurality of exchanges interconnected by trunks, an impulse storing device and means for registering the digits corresponding to a telephone number thereon, a sending device normally effective to transmit certain groups of impulses responsive to such registration, means automatically responsive when all trunks between two exchanges become busy for adapting said sending device to transmit different groups of impulses, said last means becoming effective immediately when the last idle trunk between the two exchanges is seized and means for rendering said last means ineffective with respect to the call taking into use the last idle trunk between the two exchanges.

18. In a telephone system, two groups of trunks, a register sender and means for registering groups of impulses corresponding to dialed digits thereon, means in the register sender normally effective for transmitting certain groups of impulses determined by the digits registered to extend a connection over a trunk of one of said groups, means effective when all trunks of said one group are busy for adapting said second means to transmit different groups of impulses to extend a connection over a trunk of the other group, and means for rendering said last means ineffective with respect to said second means when all trunks of the one group become busy after the first group of impulses has been transmitted.

19. In a telephone system, a line, a selector repeater accessible to said line, automatic switches accessible to said selector repeater, a register sender, a relay in said selector repeater controlled over said line for setting said register sender, a second relay in said selector repeater controlled by said register...
sender, means controlled by said second relay for operating said selector repeater and said automatic switches to extend a connection from said line, and means responsive when a connection is extended for bridging said second relay across the conductors of said line.

20. In a selector repeater, incoming conductors and outgoing conductors, a relay normally connected to said incoming conductors, a register sender controlled by said relay, a second relay controlled by said register sender, means controlled by said second relay for transmitting impulses over said outgoing conductors, and means for disconnecting said first relay from the incoming conductors and for connecting said second relay thereto.

21. In a telephone system, a trunk line comprising three sections, the first and second sections being normally disconnected, the second and third sections being connected through condensers, a relay normally connected to the first section of the trunk, a register sender controlled by said relay, a second relay connected to the second section of the trunk, said second relay being under the control of said register sender, means controlled by said second relay for transmitting impulses over the third section of the trunk, and means for disconnecting the first section of the trunk from said first relay and for connecting it to said second relay via the second section of the trunk.

In witness whereof, I hereunto subscribe my name this 29th day of December, A. D. 1926.

FRITZ LUBBERGER.