

July 14, 1942.

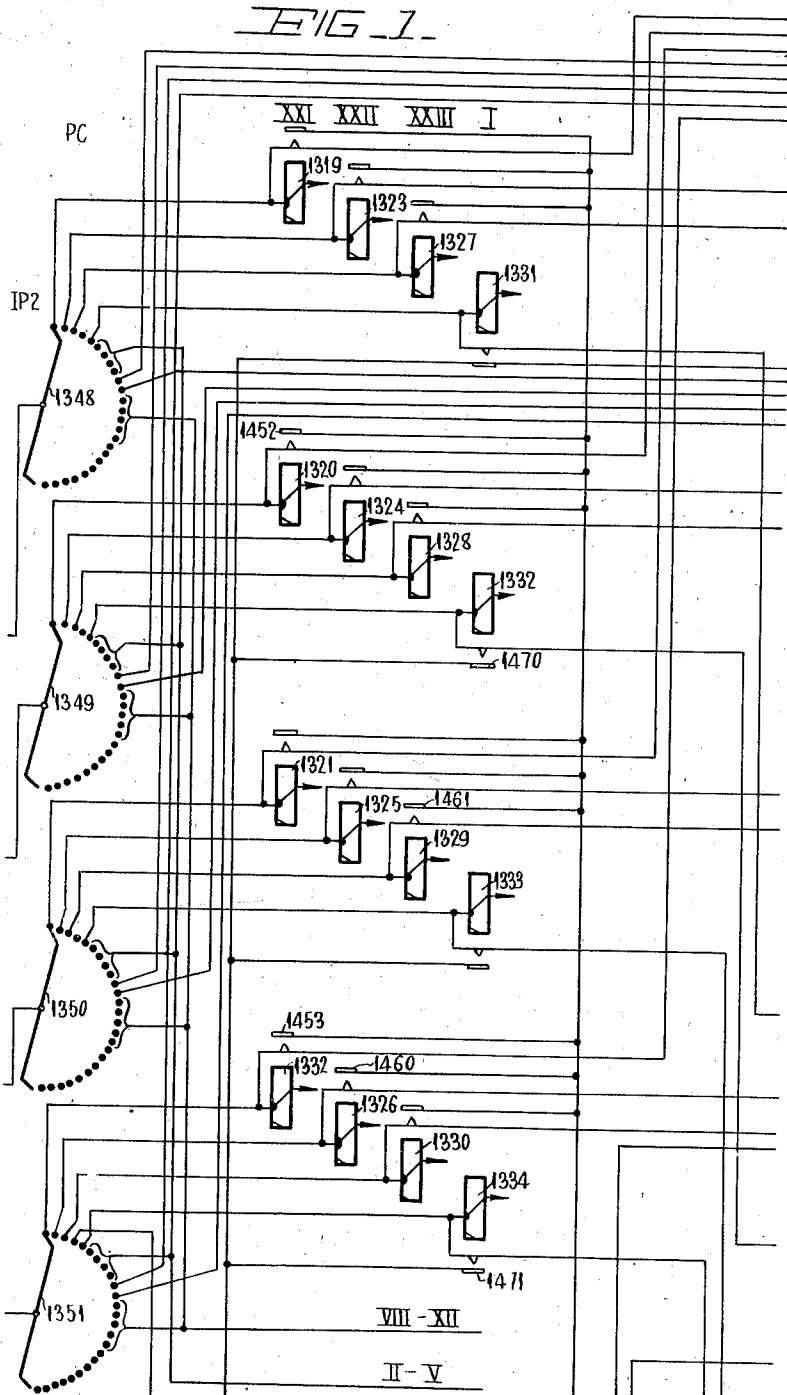
R. F. STEHLIK

2,289,939

TELEPHONE SYSTEM

Filed Dec. 18, 1939

19 Sheets-Sheet 1



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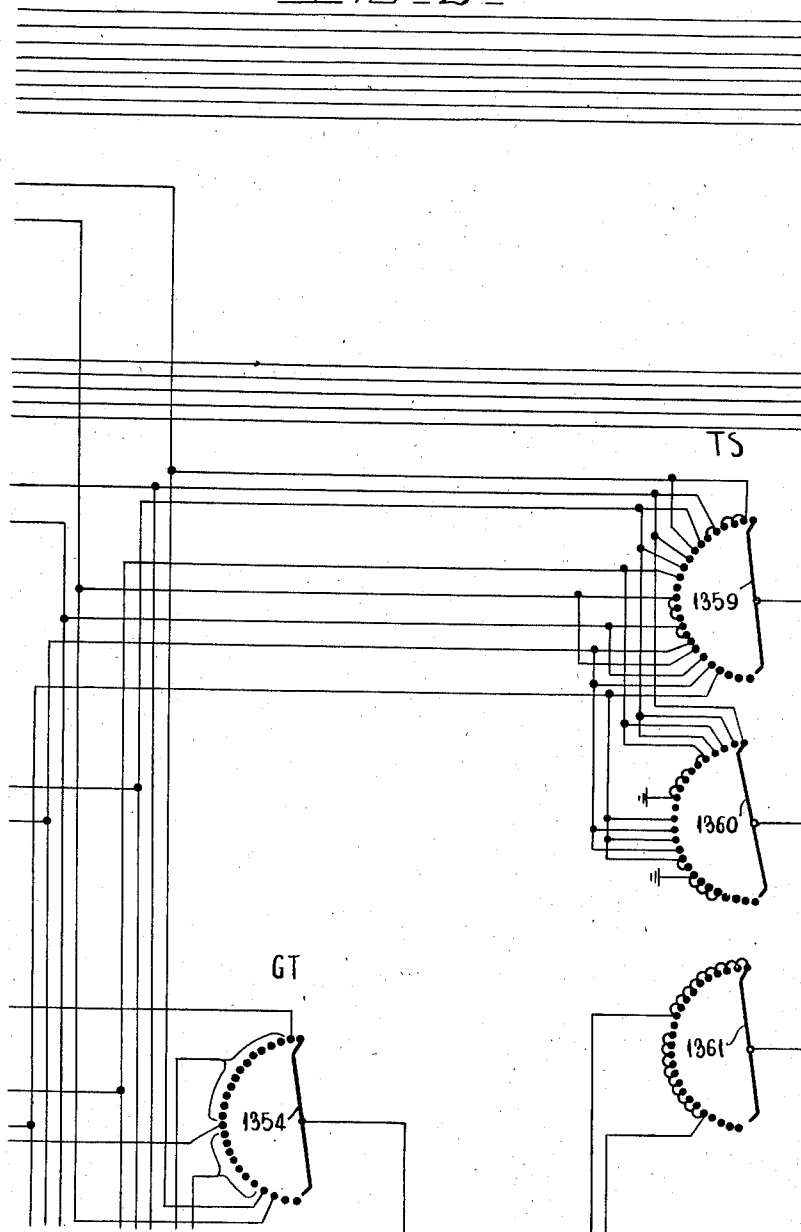
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FIG. 2



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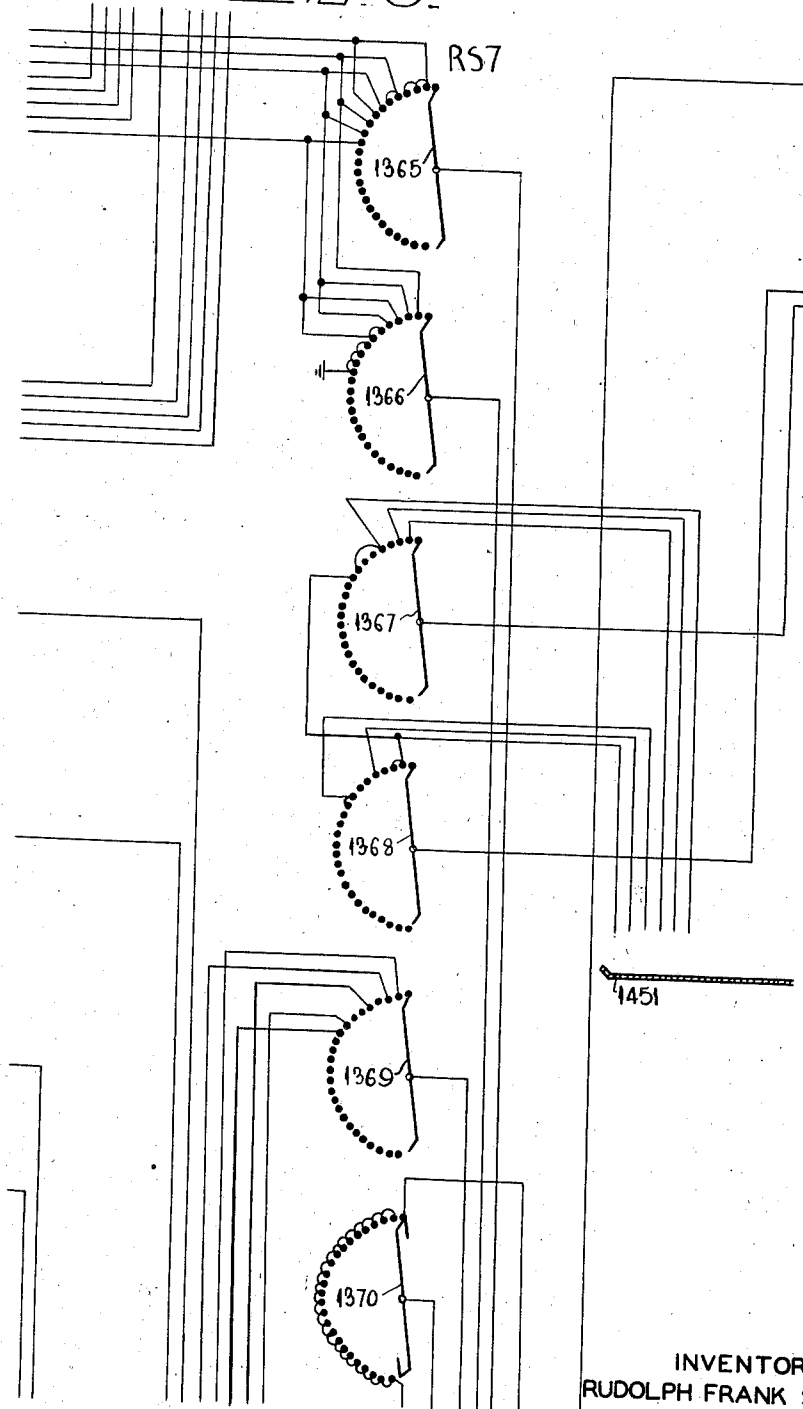
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FIG. 3.



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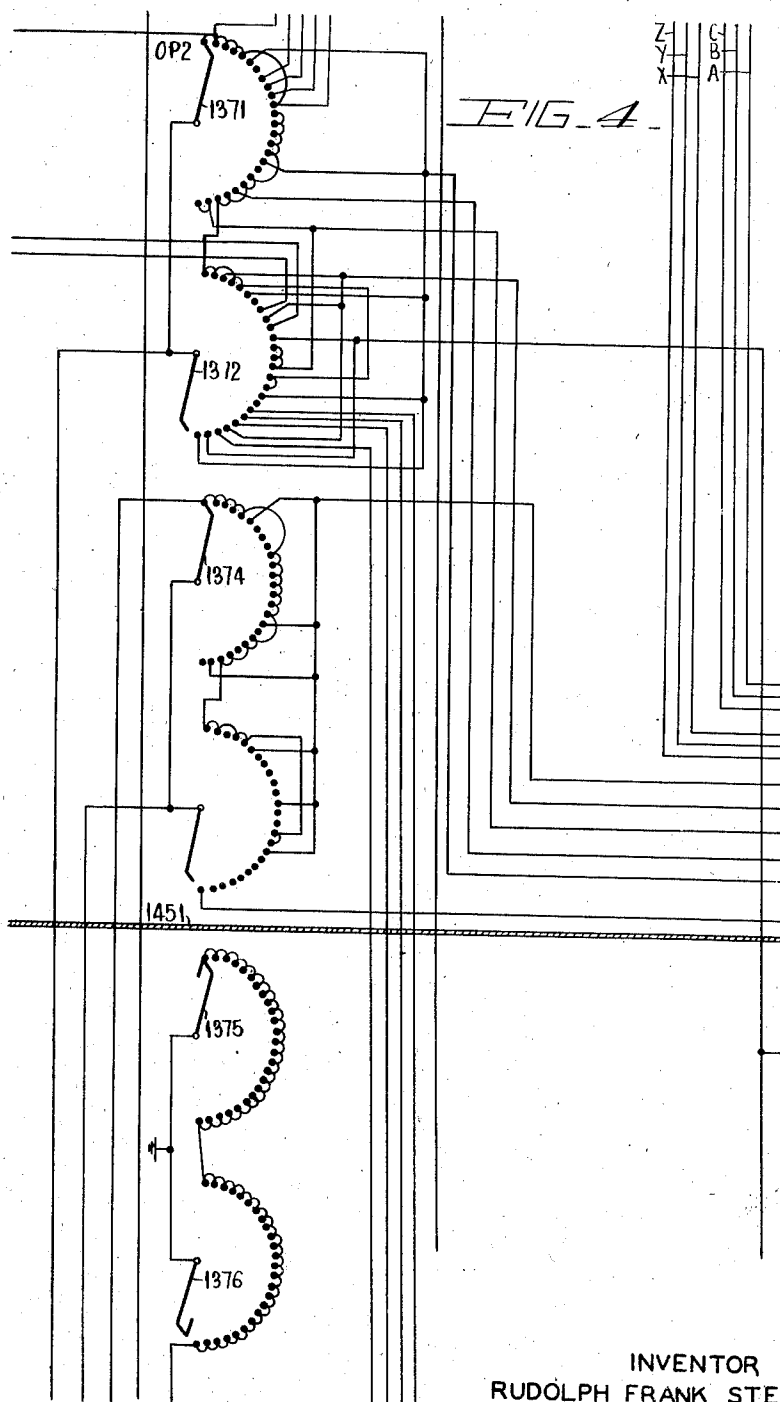
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19 Sheets-Sheet 4



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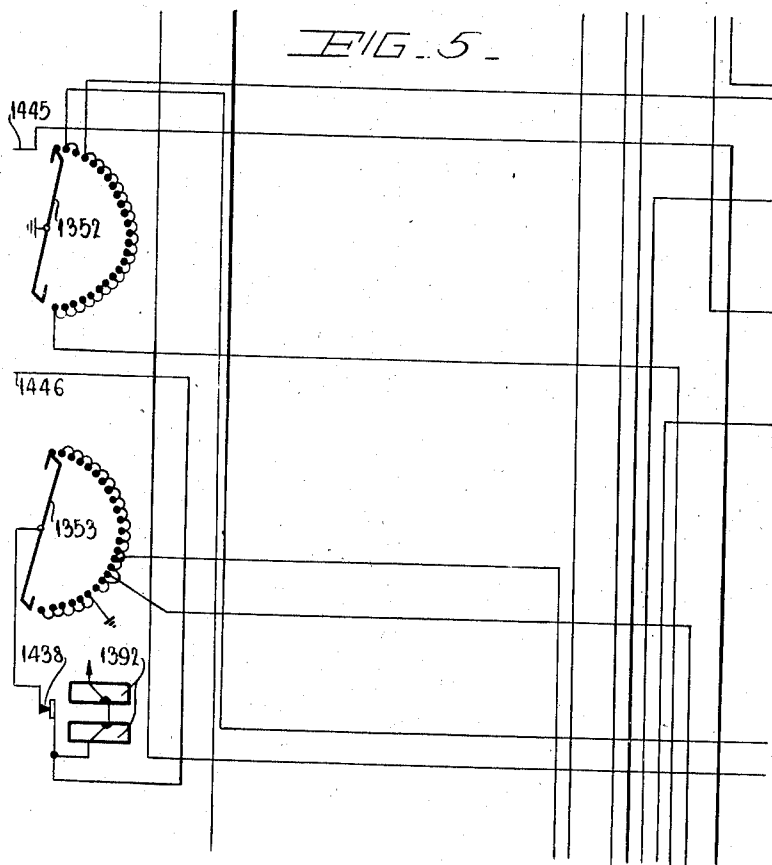
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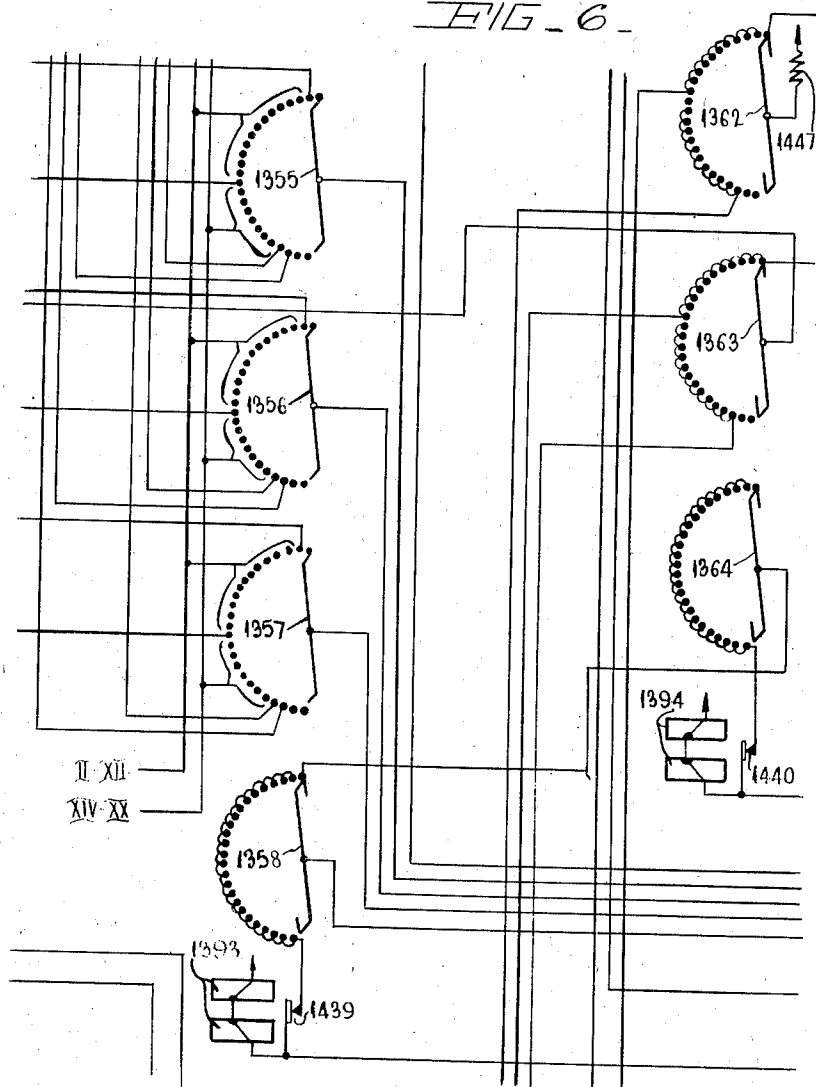
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FIG. 6.



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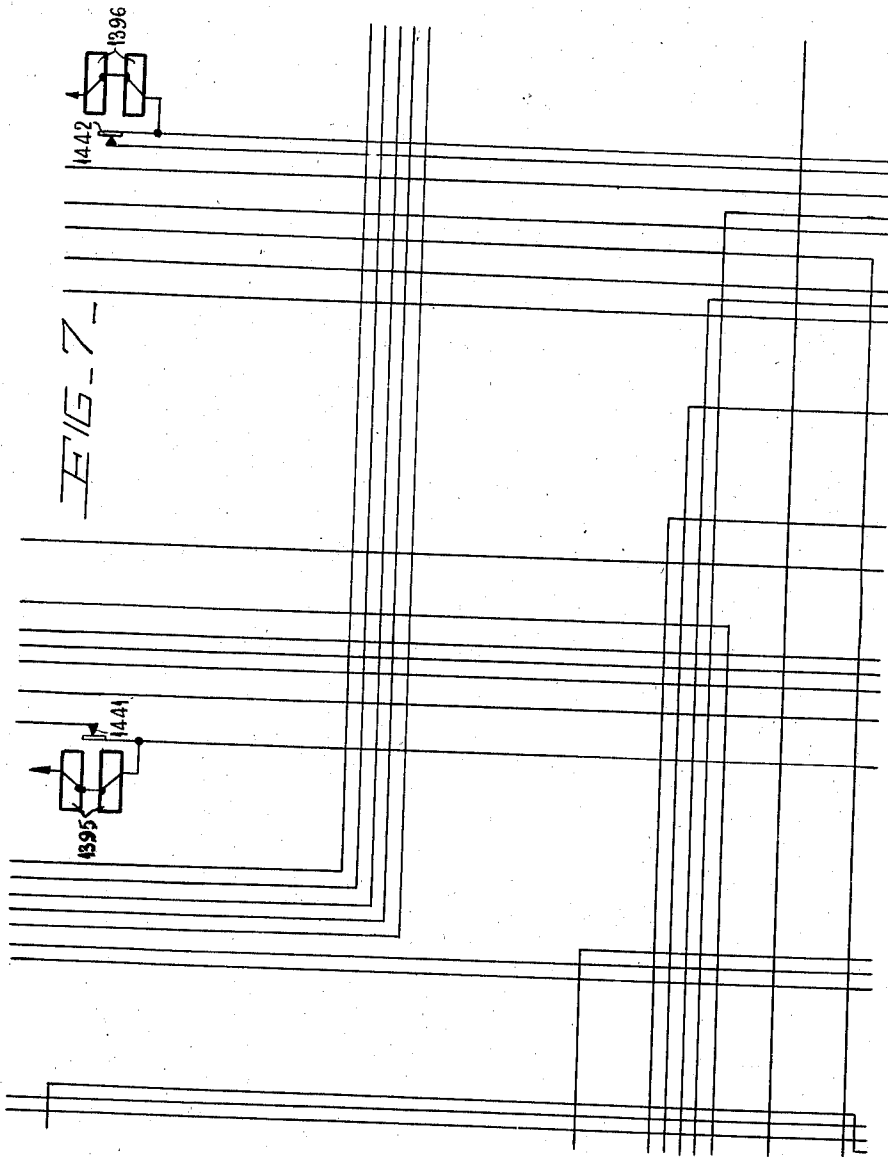
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19 Sheets-Sheet 7



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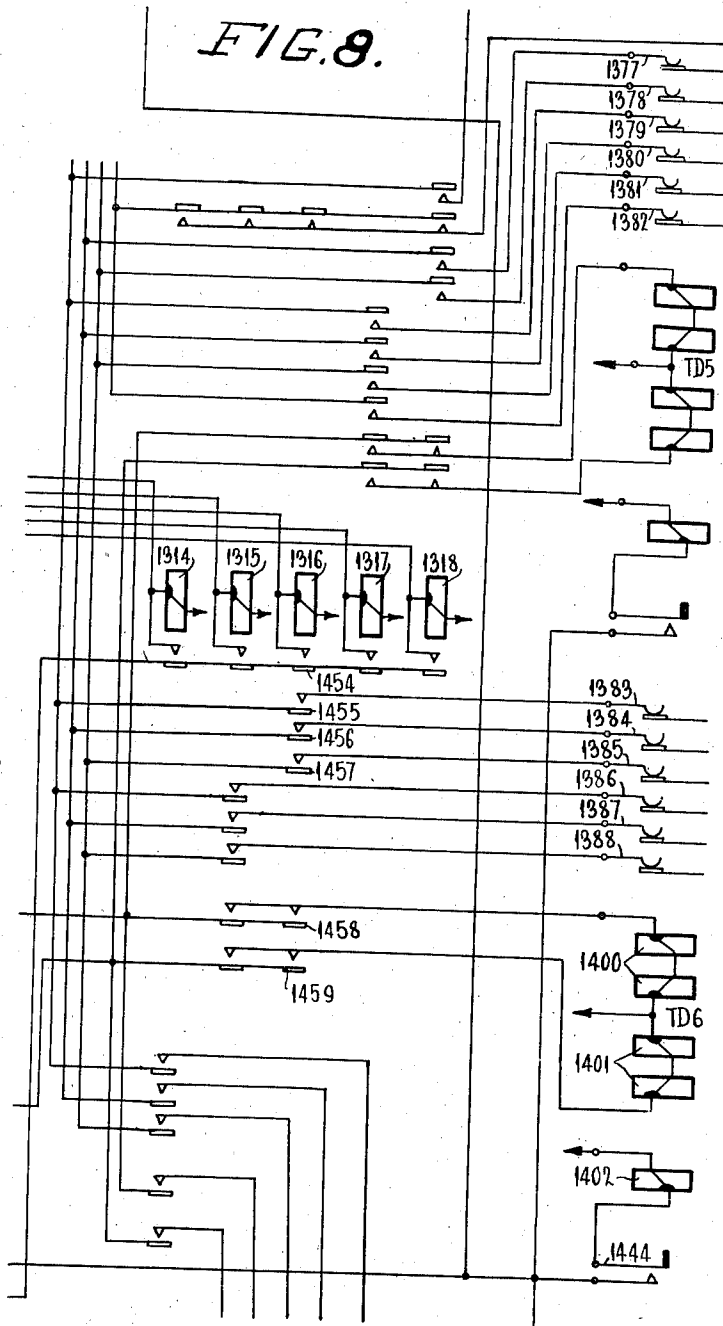
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19 Sheets-Sheet 8



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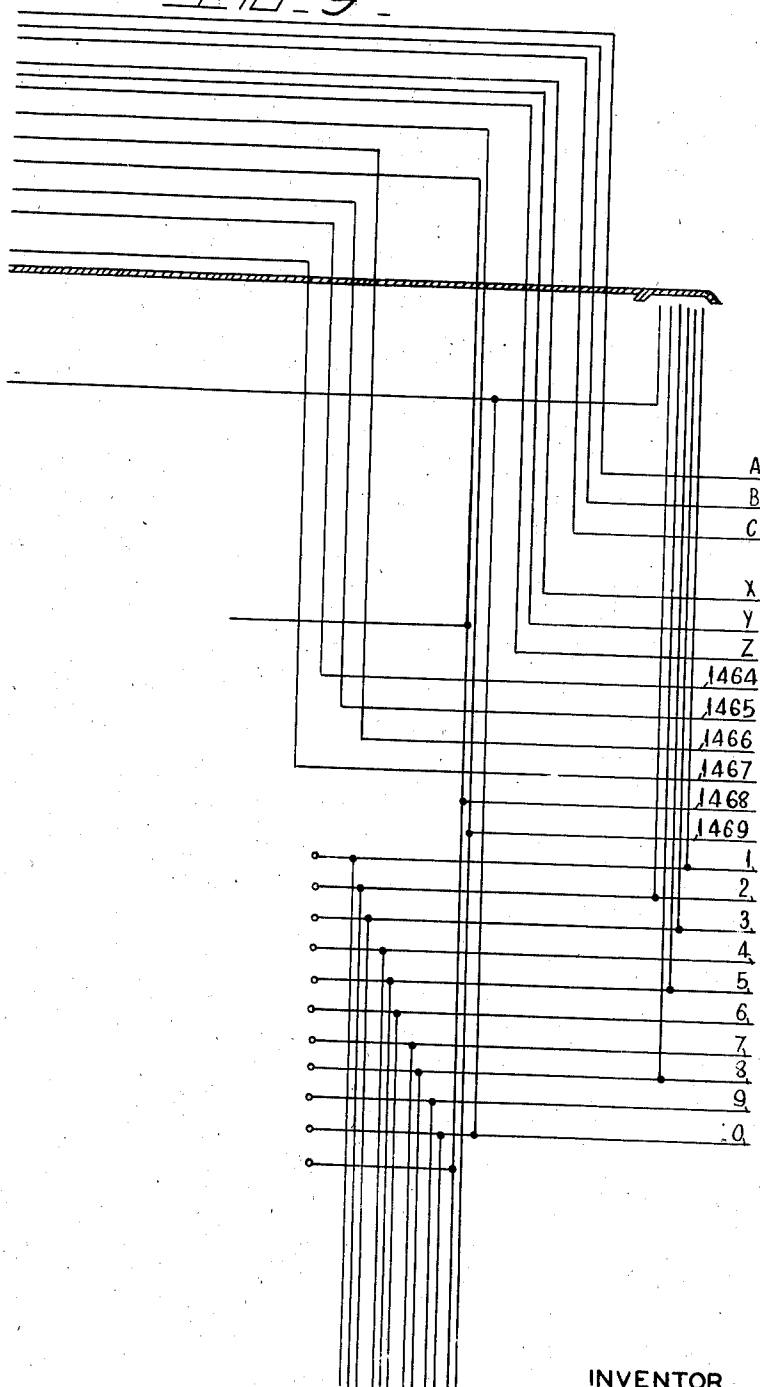
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FIG. 9



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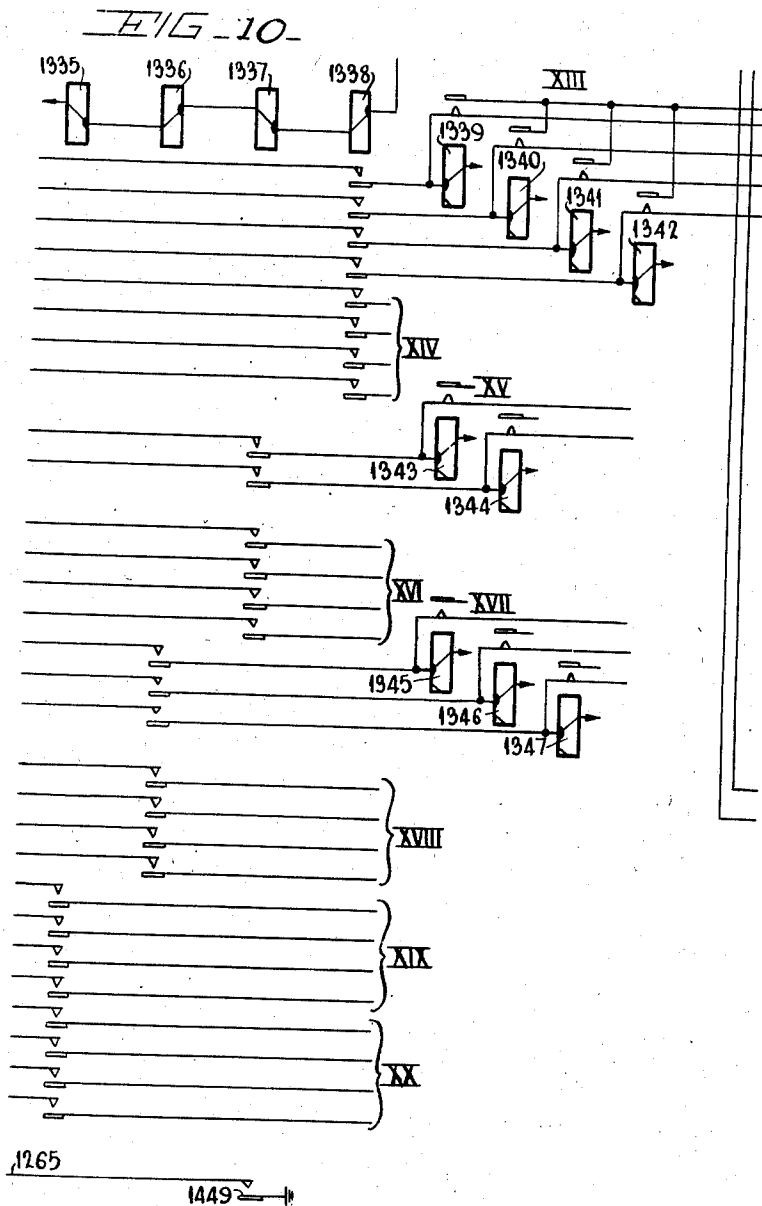
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19 Sheets-Sheet 10



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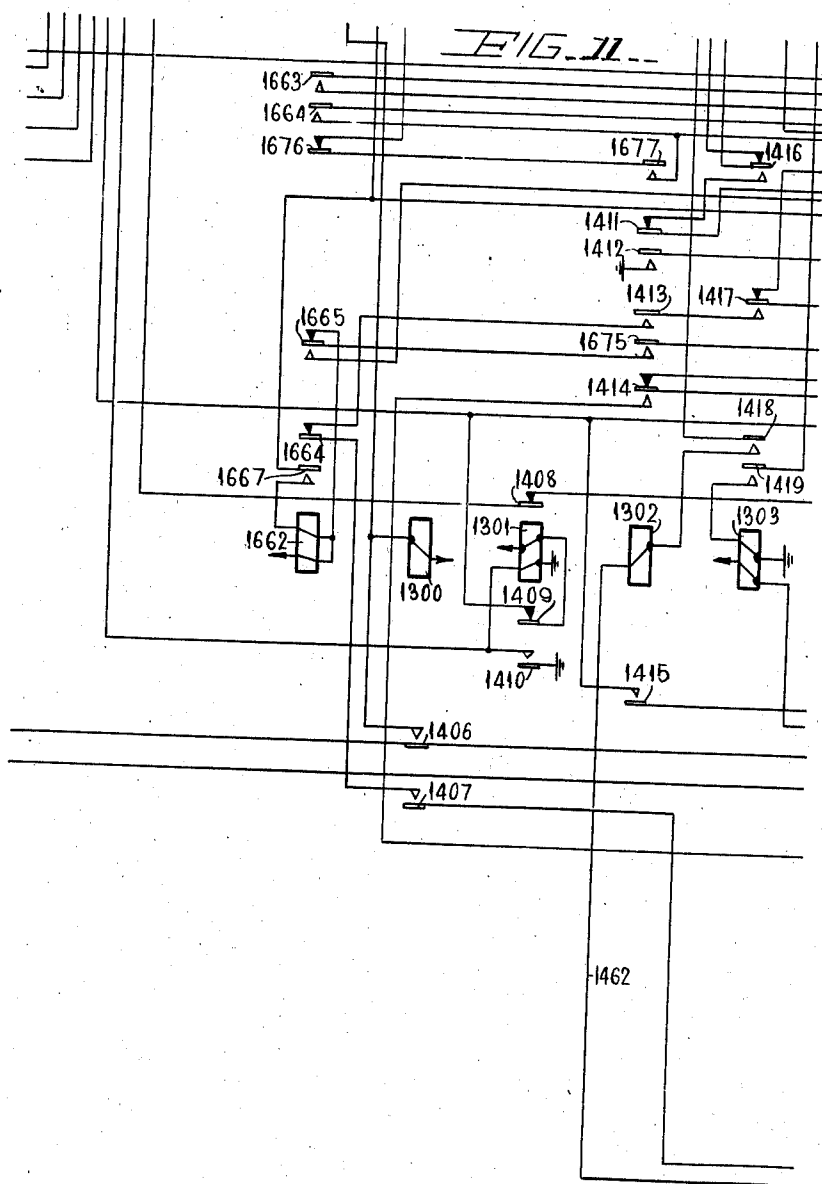
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19 Sheets-Sheet 11



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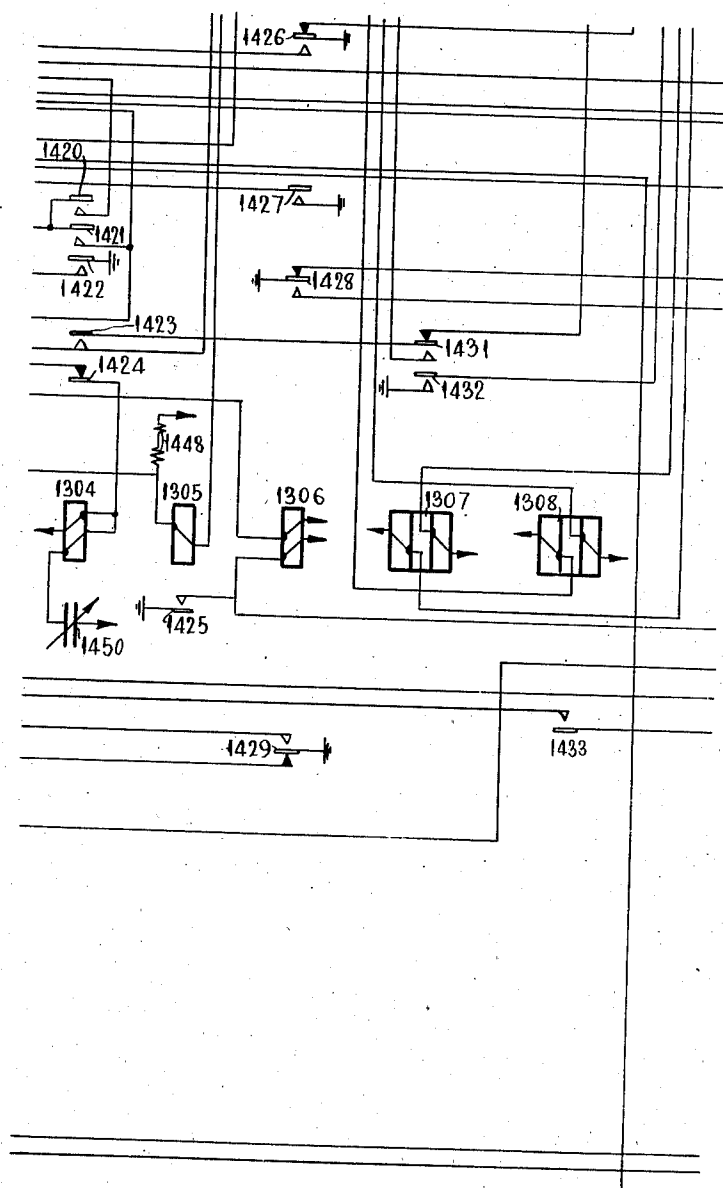
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FIG. 12.



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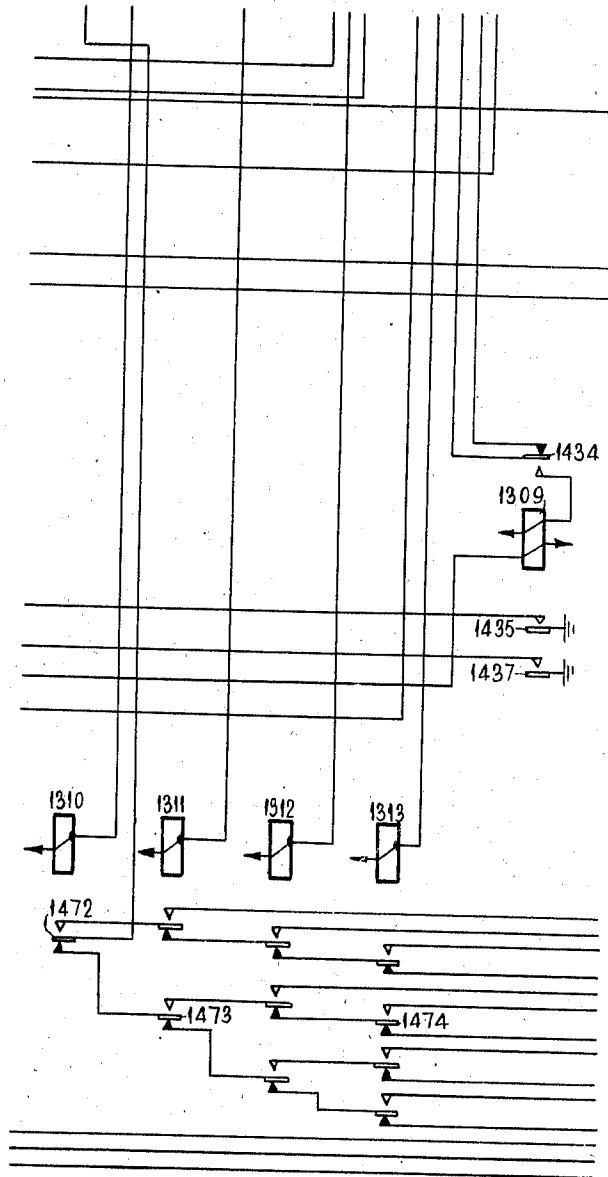
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FIG. 13.



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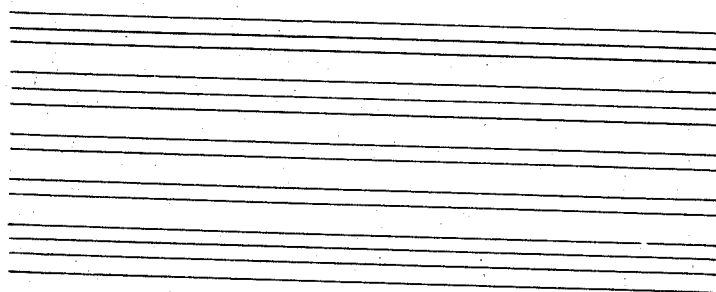
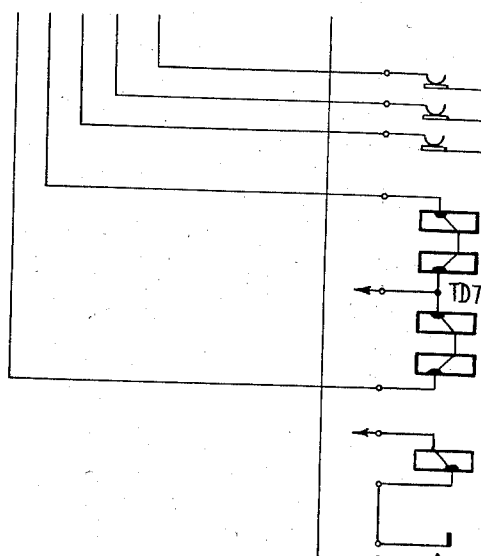
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FIG. 14.



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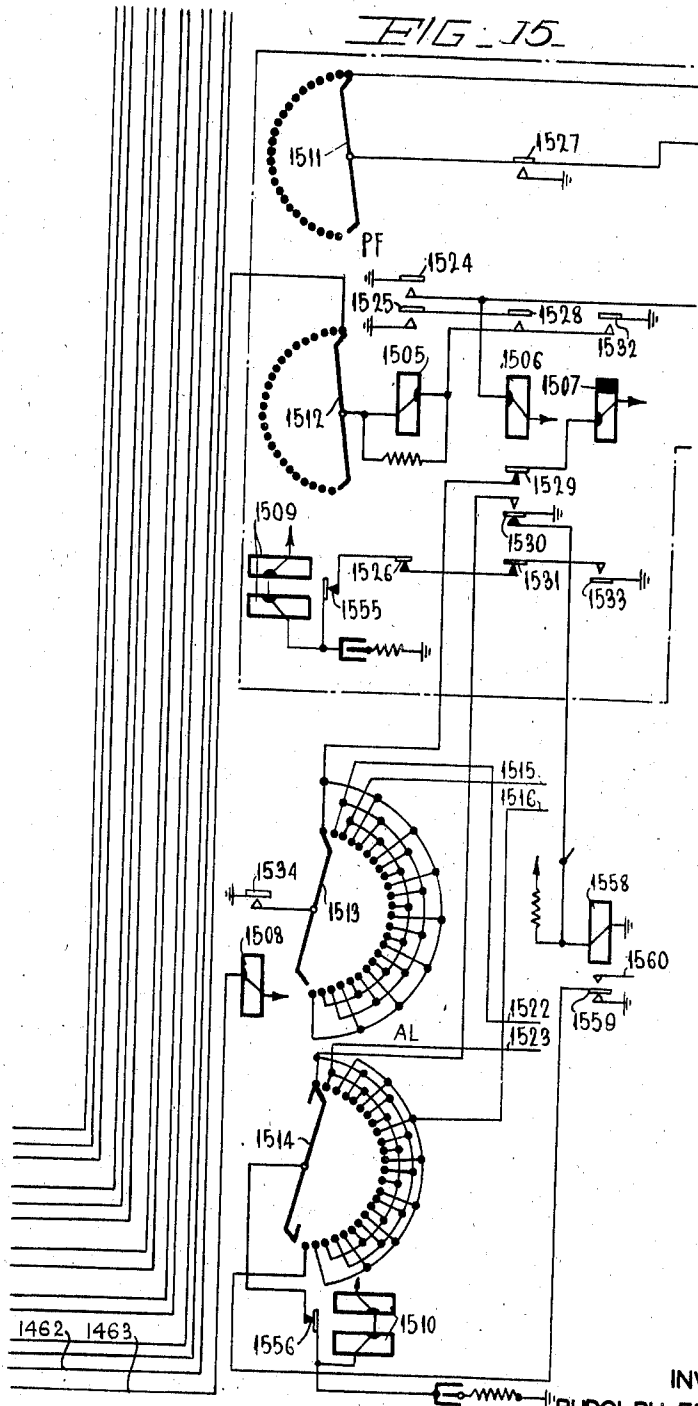
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19 Sheets-Sheet 15



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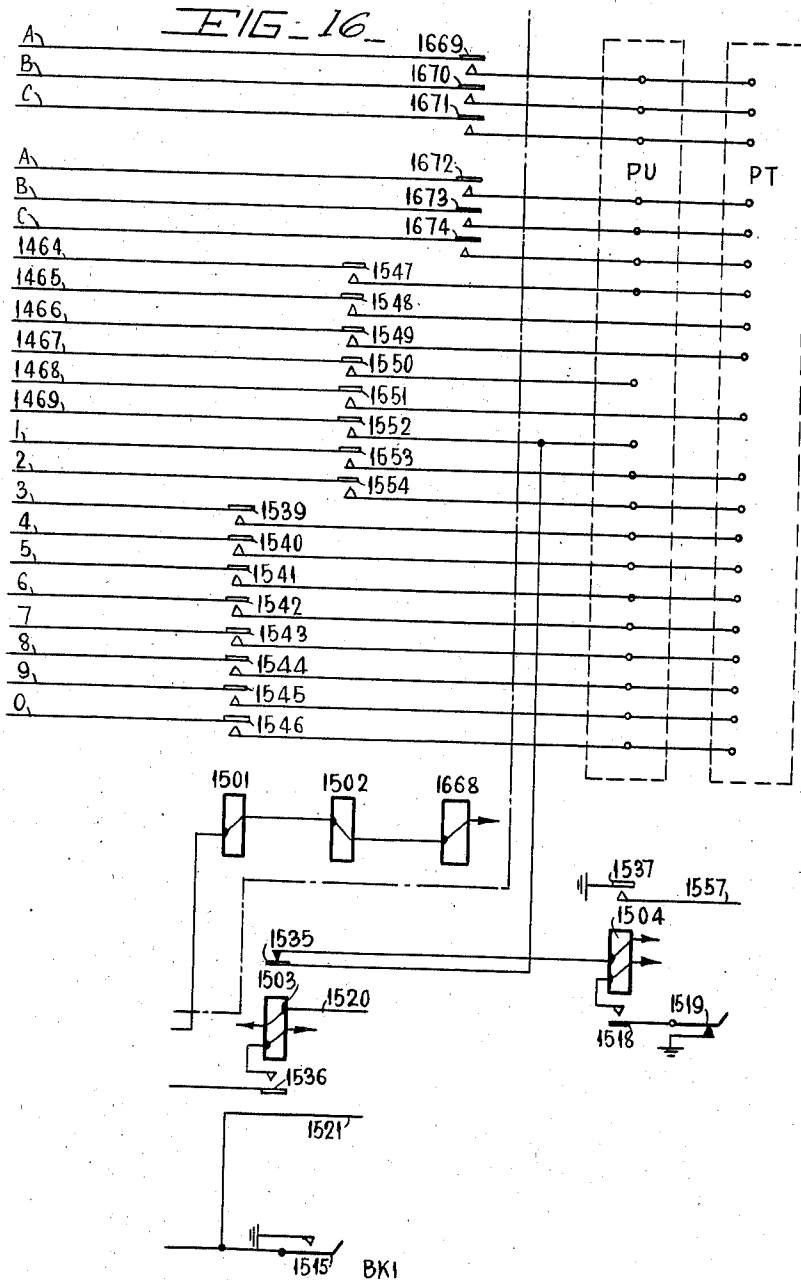
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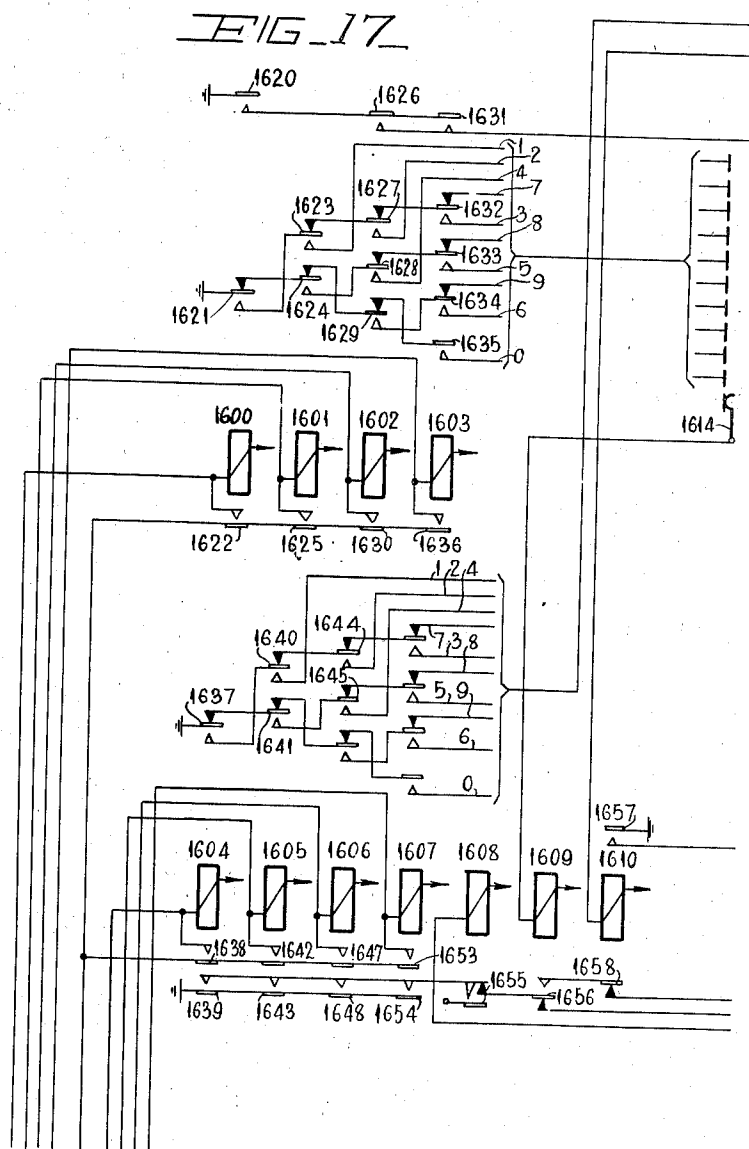
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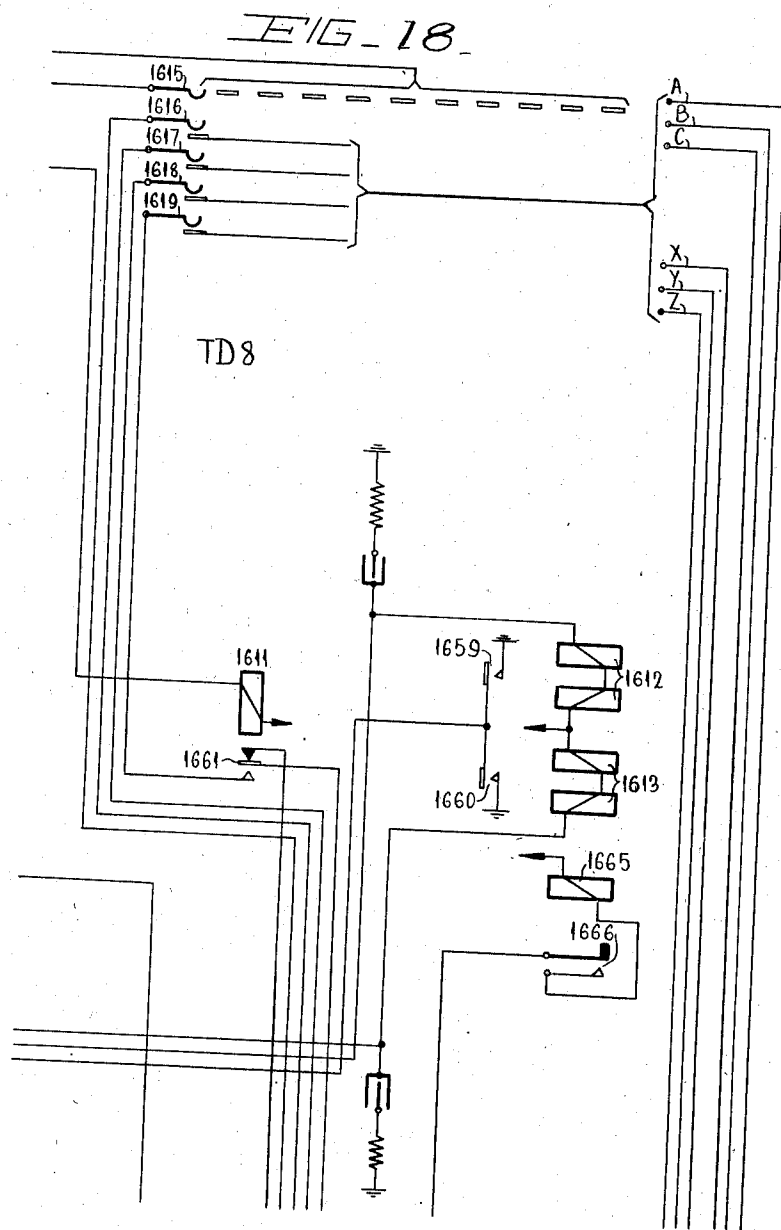
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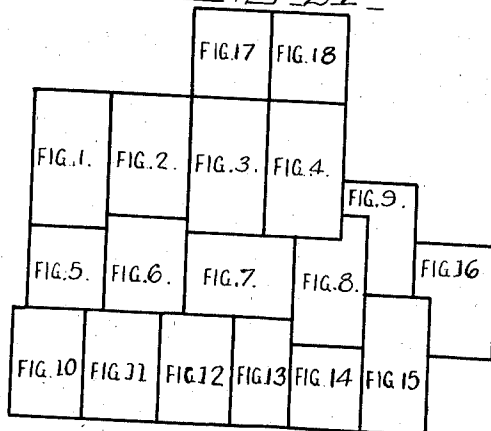
FIG. 19.

CALLING 57109	
CALLED BRUX3423	
DATE 23/12	HOURL 16.10
RATE 0.80	DURATION 09
TOTAL COST 2.40	

FIG. 20

	1	2	3	4
1	x	x		
2	x		x	
3	x			x
4		x	x	
5		x		x
6			x	x
7	x			
8		x		
9			x	
0				x

FIG. 21



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UNITED STATES PATENT OFFICE

2,289,939

TELEPHONE SYSTEM

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Application December 18, 1939, Serial No. 311,051
In Great Britain January 19, 1939

12 Claims. (Cl. 179—7.1)

The present invention relates to telephone systems and is more particularly concerned with systems provided with facilities for automatically printing information relating to a call.

In the arrangements so far proposed the identification of the subscribers whose particulars are recorded have been made according to a numerical code, and while there is no difficulty as regards the calling subscriber's number it is not clear that the numerical code for the exchange or for the zone and exchange will be readily identifiable by the subscriber and an object of the present invention is to print the wanted subscriber's exchange at least in a form which will enable ready identification to be made.

The object of the present invention is to provide arrangements whereby a certain number of letters of the exchange or zone name are printed in place of or in addition to the numerical code for such exchange or zone.

According to one feature of the invention, therefore, a translating arrangement is provided which in response to numerical digits representing a zone or exchange exerts a control corresponding to a number of letters of the exchange or zone name to cause the printer to print such letters in place of said numerical digits.

According to a further feature of the invention, a switching device adapted to be set to a number of positions, each representing a different exchange or zone causes a printer to print the name or part of the name of the exchange or zone corresponding to the position to which the switching device is set.

According to another feature of the invention, the various items of information are transmitted in the form of coded impulses to a storage device which includes an arrangement for decoding the received impulses and a switching device comprising at least one two-directional switch which is set in accordance with the numerical designation of the exchange or zone of the wanted party and serves to control the operation of a printing device to print a number of letters representing the exchange or zone name.

The invention will be better understood from the following description taken in conjunction with the accompanying drawings which show one method of carrying the invention into effect.

These drawings comprise Figs. 1-21, inclusive, and the Figs. 1-16 and 19-21 are similar to Figs. 40-56, 14, and 58 respectively in the application of John Ellis Ostline, Serial No. 278,728, filed June 12, 1939. Furthermore, Figs. 1-16, 19 and 21 are similar to Figs. 15-31 and 33, respectively, in the application of John Ellis Ostline, Serial No. 278,729, filed June 12, 1939. The circuits and apparatus contained in the present application have been designated in the same manner as the corresponding equipment in the above-men-

tioned applications. For a detailed description of the complete system including those figures of the above applications not shown in the drawings of the instant application, reference may be had to the said prior applications in which the present drawings may be substituted for the drawings of said applications to which they are above referred as being similar.

More specifically Fig. 20 shows the code employed for transmitting the various items of information. Figs. 1-16 show the circuits of the printer controller and printer as disclosed in the above mentioned applications, suitably amended to interwork with the translating device shown in Figs. 17 and 18 which is necessary in order to print on the ticket the first three or four letters of the exchange or zone designation. These figures should be arranged as shown on Fig. 21. Finally Fig. 20 shows a ticket printed with the particulars of a call.

A detailed description will, however, not be given of the whole of the circuits disclosed in these figures since such a detailed description is given in the above mentioned applications. In the present specification a detailed description of the circuit operations will only be given in so far as they are different from those disclosed in the previous applications but a brief description will be given of the general operation of the whole circuit.

The printer controller is taken into use on the termination of a connection over a toll line control circuit. The toll line control circuit has stored in it the following information.

1. The calling party's number.
2. The called party's number.
3. The rate at which the call is to be charged.
4. The duration of the call.
5. A special indication if the calling subscriber wishes to be informed at the end of the connection of the total cost of the call.

This information is stored in code in the toll line control circuit and on the seizure of the printer controller is transferred together with the time of day and day of the month to groups of storage relays therein. This transfer is effected over the wipers 1348-1351 of the switch IP2 (Fig. 1). These wipers have their corresponding bank contacts each connected to one relay of a group of four storage relays. Thus contact 1 of wiper 1348 is connected to relay 1319 of storage group XXI; contact 1 of wiper 1349 is connected to relay 1320 of storage group XXI and so on. Of these storage groups XXI, XXII, XXIII, I, VI, VII, and XIII are shown in full, the remainder being omitted in order not unduly to complicate the drawings.

The first item of information to be transferred is the rate at which the call is to be charged and this is stored on group XXI. The duration of

the call in tens and units (minutes) is stored on groups XXII and XXIII and as soon as this information is stored a particular one of the two-directional calculating switches TD5, TD6, or TD7 is selected in accordance with the operation of the relays of group XXI, the switch RS7 controlling the selection of the two-directional switch and also of the appropriate wipers of the selected switch.

The next item of information to be stored in the printer controller is the calling party's number which is stored on storage groups I-V. Following this the called party's number which comprises seven digits, the initial digit 0 not being stored, is stored on groups VI-XII. Of these storage groups those numbered VI and VII are shown in detail in Fig. 17 and it is to be noted that each group of storage relays in addition to having locking contacts also control a contact pyramid which serves to decode the stored information. As soon as the third dialled digit has been stored on group VII a circuit is completed from earth, armature 1639, 1643, 1648 or 1654 (Fig. 17) make-before-break contacts associated with armature 1655, armature 1656, winding of vertical magnet 1612 of the two-directional switch TD8 (Fig. 18) to battery. The vertical magnet 1612 energises and raises the wipers one step while at armature 1659 it extends earth to the winding of relay 1608. Relay 1608 energises and at armature 1655 opens the above traced circuit for the vertical magnet. The vertical magnet and relay 1608 continue to interact until the vertical wiper 1614 reaches a contact to which earth is extended over the contact pyramid controlled by the relays of group VI in accordance with the digit stored therein. When this occurs relay 1609 energises and at armature 1656 and its resting contact opens the circuit for the vertical magnet 1612 and at its operated contact closes a circuit over armature 1658 for the rotary magnet 1613 of the two-directional switch TD8. The rotary magnet 1613 energises and closes a circuit for relay 1608 at armature 1660 whereupon interaction between the magnet and the relay takes place in a manner similar to that described for the vertical magnet 1612. This interaction continues until wiper 1615 of the two-directional switch TD8 reaches the contact which has been earthed over the contact pyramid controlled by the relays of group VII in accordance with the digit stored therein. Relay 1610 therefore energises and at armature 1659 opens the circuit for the rotary magnet 1613. The two-directional switch has now been set in accordance with the second and third digits dialled by the calling party that is to say in accordance with the zone designation of the called party and hence the position taken up by the wipers is characteristic of this zone and of no other. Consequently by means of cross-connections between wipers 1616, 1617 and 1618 and conductors A, B, C . . . X, Y, Z which control the alphabetical electromagnets of the printer, it will be understood that three letters of the zone name can be printed in place of the two digits representing the zone. The arrangement of the two-directional switch is thus that of a translating device.

The setting of the switch TD8, the selecting and setting of one of the switches TD5, TD6 and TD7 and the storing of the remainder of the items of information in the printer controller proceed simultaneously. Relay 1308 (Fig. 12) operates at the termination of the rotary movement of

the selected one of the switches TD5, TD6 and TD7 and when the switch TD8 has also been set, earth is extended from armature 1657 (Fig. 17), armature 1433 of relay 1308 (Fig. 12), lower winding of relay 1303 to battery. Relay 1363 operates and locks over armature 1419 and at armature 1418 completes a circuit which extends as follows: earth, wiper 1352 of the switch IP2 (Fig. 5), wiper 1363 of the switch TS on the second portion of its bank, armature 1416 in its operated position, armature 1411, conductor 1463, winding of relay 1508 to battery. Relay 1508 in operation causes the allotting switch AL to associate an idle printer with the printer controller and earth is thereupon extended from armature 1532 (Fig. 15), winding of relay 1505, wiper 1512, conductor 1462, winding of relay 1392, armature 1418, bank contact and wiper 1362 to resistance 1447 and battery. Relay 1505 in the printer finder PF and relay 1302 in the printer controller operate and relay 1392 at armature 1414 completes a new circuit for the impulse generating relay 1304 which extends to earth at armature 1437 (Fig. 13) and at armature 1677 prepares a point in an energising circuit for magnet 1393 of the switch GT.

In addition relay 1362 at armature 1675 prepares a circuit for relay 1662. Relay 1662 has been added to the printer controller circuit in order to control the printing, if necessary, of a star on the ticket thereby indicating that the subscriber wishes to be informed of the cost of the connection. Previously the control of this printing operation was effected over contact 1 associated with wiper 1371 of the switch OP2. It will be understood that since at least three letters are to be printed in place of two digits as in the prior arrangement, an additional position is required in the bank associated with wipers 1371 and 1372. By employing relay 1362 to control the printing of the star an extra position is made available in the contact bank associated with wiper 1371.

Assuming that the star is to be printed then relay 1390 will have been operated over wiper 1351 of the switch IP2 in position 4 and consequently on the first operation of relay 1304 over the above traced circuit, earth is extended from armature 1422 (Fig. 12), armature 1417 in its operated position, armatures 1413, 1656 and 1407 to conductor 1469 which is connected to the star printing magnet. The star is thus printed on the ticket. In addition on the first energisation of relay 1304 the following circuit is closed for energising the magnet 1393 of the switch GT: earth armatures 1412, 1421, 1677, 1676, winding of magnet 1393 to battery. Finally on the first energisation of relay 1394 a circuit is closed for relay 1662 from earth at armature 1412, armatures 1421, 1675, 1665, lower winding of relay 1662 to battery. Relay 1662 is a two-step relay and operates its "X" armature 1667 only at this time. When relay 1304 releases, however, relay 1662 operates fully over both windings in series, its "X" armature 1667 to earth at 1427. At armature 1666, relay 1662 opens the circuit whereby earth is extended to conductor 1469 so that the associated printer magnet is de-energised. In addition at armature 1665 and its resting contact relay 1662 opens its original energising circuit and at its operated contact prepares a circuit for the magnet 1396 (Fig. 7) of the switch OP2 which circuit is completed on the reenergisation of relay 1304. At armatures 1663 and 1664 (Fig. 11) the pairs of wipers 1371, 1372 and 1373, 1374

of the switch OP2 are connected to earth under the control of armatures 1420 and 1421 respectively of the impulse generating relay 1304. It will be appreciated that the inclusion of armatures 1663, 1664, and 1665 prevent the switch OP2 from operating until the star indication has been printed. Finally relay 1662 at armature 1676 opens the above traced circuit to magnet 1393 of the switch GT which thereupon de-energises and steps the wipers to position 2.

When relay 1304 operates for the second time, as pointed out above magnet 1396 is energised preparatorily to stepping the wipers of the switch OP2. Since the wipers of the switch GT are now on contact 2 the transfer relays 1310 to 1313 have been operated in accordance with the operation of the relays of storage group I. Consequently when earth is extended over wiper 1371 on contact 1 this earth will be extended over the contact pyramid controlled by the transfer relays of the appropriate conductors extending to the electromagnets of the printer. In addition the magnet 1393 of the switch GT is again energised on the second energisation of relay 1304 but this time the circuit extends over wiper 1373 of the switch OP2 on contact 1. When relay 1304 de-energises magnet 1396 de-energises and steps the wipers of the switch OP2 on to contact 2 and the circuit of magnet 1393 of switch GT is also de-energised on the release of relay 1304 to step the wipers on to contact 3. This interaction between relay 1304 and the magnets of the switches OP2 and GT continues until the wipers of the switch OP2 are stepped on to contact 6 by which time the digits stored on groups I-V of the storage relays and comprising the calling party's number have been printed on the ticket. With wipers 1371 of the switch OP2 on contact 6, earth is extended, on the operation of relay 1304, to conductor 1464 leading to the printer in order to cause the operation of the shift mechanism. The wipers of the switch GT are, however, not stepped in this case. Contact 7 associated with wiper 1371 is left blank in order to give the shift mechanism time to complete its operation. Contacts 8, 9 and 10 associated with wiper 1371 are connected to wipers 1616, 1617 and 1618 of the switch TD8 and thus as the switch OP2 is stepped over these positions earth is extended over the wipers in turn in order to cause the printing of the first three letters of the exchange or code name. It will be appreciated that during this time the wipers of the switch GT must be stepped over two contacts which in the previous arrangement effected the transfer of the digits stored in groups VI and VII to the transfer relays 1310—1313. Consequently with wiper 1373 of the switch OP2 on contacts 10 and 11 earth is extended over this wiper to cause the operation of the magnet 1393 of the switch GT. It will of course be appreciated that alternatively the wiring to the banks of the switch GT may be altered in order to avoid the occurrence of the two unused contacts.

In certain cases where the first three letters of two zone names are the same, it will be necessary to print the first four letters of the zone name. The determination as to whether the fourth digit in the called party's number is to be printed as a digit or as a letter is effected in accordance with the condition of relay 1611. The operation of this relay is controlled in accordance with the operation of one or more contacts of relays of storage group VI. Thus if the second digit dialled by the calling party is 2 or 3

a circuit is completed from earth at armature 1620, armature 1626 or 1631, winding of the relay 1611 to battery. Relay 1611 in operating at armature 1661 prepares a circuit which is completed when wiper 1371 of the switch OP2 steps on to contact 11. This circuit extends as follows: earth on wiper 1371 on contact 11, armature 1661 to the contact pyramid controlled by the transfer relays 1310 to 1313. In this case, therefore, the 3rd digit transmitted by the calling subscriber is printed on the ticket in numerical form since the transfer relays have been operated over the wipers of switch GT on contact 9 in accordance with the set of the relays of the storage group VIII.

If, however, relay 1611 is not operated then earth is extended over wiper 1371 on contact 11, armature 1661 in its resting position, wiper 1619 and thence to the winding of the appropriate alphabetical electromagnet. A fourth letter is thus printed in this case and although the transfer relays are again operated in accordance with the operation of storage group VIII this is of no effect since no earth is connected to the contacts controlled by the transfer relays.

When the wipers of the switch OP2 are stepped to contact 12, earth is again extended over wiper 1371 and the contacts controlled by the transfer relays in order to print the remaining items of information as described in the previously mentioned applications. Further description of this operation is not, however, considered necessary for an understanding of the present invention.

With regard to the release of the additional equipment the storage relays will be released on the release of relay 1306 as previously described. With regard to the restoration to normal of the two-directional switch TD8, the release of the two-directional switches TD5, TD6 and TD7 as described in the previously mentioned applications is effected on the release of relay 1306 when earth at armature 1428 is extended to the windings of the release magnets of the three switches in parallel. It is arranged that the same earth is also extended over off-normal springs 1666 and release magnet 1665 of the switch TD8 in order to restore the switch to normal.

It will be understood that the above embodiment is given by way of example only and that the invention may be carried into effect in other ways. For instance it may be that the exchange or zone code comprises three digits instead of two as is the case in the London area. One way of dealing with this would be to provide a two-directional switch which responds to the first digit and then hunts for a second two-directional which responds to the second and third digits. The control of the printing leads could then be effected over the wipers of one or both of the switches.

It will be understood that the type of translating device which is employed could be varied. The essential property of the translating device is that it must have a characteristic position for every exchange or zone. Thus it would be possible to arrange a plurality of single motion switches on each of which is registered one of the numerical digits of the exchange or zone name and markings are extended from these switches to contacts in the banks of a hunting switch which is set in operation to hunt for the markings and to control over one of the wipers the operation of the printer.

In an alternative arrangement the translation

from a numerical code representing the exchange name may be converted into a letter code representing the exchange name by modifications in the register translator which first responds to the impulses dialled by the calling subscriber, and instead therefore of sending impulses corresponding to a numerical code over the lines, for which a maximum of ten combinations would be required, one would send over the line a letter code for which a maximum of twenty-six combinations would be required. Actually when the letters Z and Q are not used only twenty-four combinations are needed. The responding apparatus by which the printer is eventually operated would of course be modified accordingly so as to be able to receive the letter code and subsequently to transfer it to the printer.

It will be appreciated that three or even four letters may not be sufficiently distinguishing and might lead to confusion but there is no reason why further letters could not be employed, all that is necessary being to provide more wipers on the switch TD8. It would usually be sufficient if these were limited to four or five and not necessarily the first digits of the exchange name. For instance, the first four letters would not distinguish between exchange names like Waltham Cross, Walthamstow and Walton-on-Thames, but Waltham Cross could conveniently be represented by "WLTX," Walthamstow could be represented by "WLTMW," and Walton-on-Thames could be represented by "WLTNT."

Further in order to reduce the number of leads extending between the printer controller and the printer, the control between the two circuits may be effected in code. A six digit code would probably be sufficient and hence six leads only would extend between the two circuits to effect the printing of the letters. De-coding relays would then have to be employed in the printer and the printing magnets would be controlled over the contacts of the relays.

I claim:

1. In a telephone system, a set of registers, means for storing in said set of registers numerical digits indicative of an exchange name, a record producing device selectively operative repeatedly to make entries upon an associated record, means operated responsive to the storage of the numerical digits indicative of said exchange name in said set of registers for translating said numerical digits of said exchange name into a plurality of markings indicative of letters of said exchange name, said last means including cyclically operative means for selectively operating said record producing device in accordance with the markings indicative of letters of said exchange name, whereby said record producing device is operated to make entries upon the associated record of alphabetical letters corresponding to said exchange name.

2. In a telephone system, a set of registers, means controlled by a calling subscriber for operating said registers in accordance with numerical digits representing an exchange name, a record producing device selectively operative to make entries upon an associated record, means operated in response to the operation of said set of registers for translating said numerical digits representing said exchange name into indications representing letters of said exchange name, and cyclically operative means operated responsive to the operation of said translating means for selectively operating said record producing device in accordance with said indi-

cations, whereby said record producing device is operated to make entries upon the associated record of the letters representing said exchange name.

3. In a telephone system, a set of registers, means for storing in said set of registers a plurality of variable items of record information pertaining to a telephone connection including numerical digits representing an exchange designation, a record producing device selectively operative repeatedly to make a plurality of variable entries upon an associated record, a translating device operated in response to the storage of the numerical digits representing the said exchange designation in said set of registers for translating the numerical digits of said exchange designation into a plurality of markings representing letters indicative of said exchange name, and cyclically operative means operated responsive to said translation for selectively operating repeatedly said record producing device in accordance with the items stored in said set of registers and in accordance with said markings representing the letters of said exchange name, whereby said record producing device is operated to make a plurality of different entries upon the associated record corresponding to the items stored in said set of registers including the letters of said exchange name.

4. In a telephone system, a set of registers, a plurality of exchanges, means for storing in said set of registers numerical digits indicative of an exchange name, a switching device operative to any one of a number of positions to translate the numerical digits indicative of an exchange name into letters indicative of an exchange name, each of said positions representing a different one of said exchanges, a record producing device selectively operative to make entries upon an associated record, means operated responsive to the operation of said set of registers for controlling said switching device to select one of said exchange positions in accordance with the numerical digits stored in said set of registers, and cyclically operative means operated responsive to the selection of one of said exchange positions for selectively operating said record producing device in accordance with the said selected exchange position of said switching device, whereby said record producing device is operated to make entries upon the associated record of the letters indicative of the exchange name selected by the numerical digits stored in said register.

5. In a telephone system, a plurality of exchanges in said system, a set of registers, means for storing in said set of registers a plurality of variable numerical digits representing different exchanges in said system, a switching device operable to a plurality of positions, each of said positions representing a different one of said exchanges, a record producing device selectively operative repeatedly to make a plurality of variable entries upon an associated record, means operated responsive to the storing of numerical digits of a particular exchange in said register for operating said switching device to a position individual to the said exchange, and means operated responsive to the operation of said switching device for selectively operating said record producing device in accordance with the position of said switching device, whereby said record producing device is operated to make entries upon the associated record of the alpha-

betical letters representing said particular exchange name.

6. In a telephone system, a set of registers, means for storing information in said set of registers in the form of coded digits, a record producing device selectively operative repeatedly to make a plurality of variable entries upon an associated record, a switching device, said switching device comprising a two-directional switch operated in accordance with the coded digits stored in said set of registers to a position indicative of an exchange name, and cyclically operative means operated responsive to the operation of said switching device for selectively operating said record producing device in accordance with the position of said switching device, whereby said record producing device is operated to make a plurality of different entries upon an associated record of the letters corresponding to the exchange name.

7. In a telephone system, a set of registers, means for storing information in said set of registers in the form of coded impulses, a record producing device having an associated record, a switching device, said switching device including a set of wipers operated in accordance with the coded impulses stored in said set of registers to select a position indicative of an exchange name, and cyclically operative means for controlling the operation of said record producing device over said set of wipers and said selected position of said switching device, whereby said record producing device is selectively operated repeatedly to make a plurality of different entries upon an associated record of the letters corresponding to the selected exchange name.

8. In a telephone system, a set of registers, means for storing in said set of registers numerical digits representing an exchange name, a record producing device selectively operative repeatedly to make a plurality of variable entries upon an associated record, means including a first stepping mechanism for conditioning said record producing device to make the entries in a predetermined order upon the associated record, a second stepping mechanism, a plurality of positions associated with said second stepping mechanism, each of said positions representing a different exchange, means for operating said second stepping mechanism in accordance with the numerical digits stored in said registers, whereby said second stepping mechanism is operated to select a position indicative of the stored numerical digits and thereby translate the numerical digits representing an exchange name into letters representing an exchange name, and means including the selected position of said second stepping mechanism and said first stepping mechanism for selectively operating said record producing device in a predetermined order, whereby said record producing device is operated to make entries of the letters representing the said exchange name upon the associated record.

9. In a telephone system, a code register operated to store particulars pertaining to a telephone connection on a coded numerical basis, a record producing device selectively operative to make a plurality of different entries upon an associated record, translating apparatus automatically operated responsive to the operation of said register to translate a certain portion of

said stored particulars from a coded numerical basis to a decimal numerical basis and to translate the remaining portion of said stored particulars from a coded numerical basis to an alphabetical letter basis, and cyclically operative means operated responsive to said translation for selectively operating said recording device in accordance with said decimal and alphabetical translation, whereby said record producing device is operated to print a plurality of different entries upon an associated record corresponding to particulars pertaining to a telephone connection on a decimal numerical basis and on an alphabetical basis.

10. In a telephone system, a set of registers, means for storing in said set of registers numerical digits indicative of an exchange designation, a record producing device selectively operative repeatedly to make entries upon an associated record, a hunting switch and associated bank contacts, means operative responsive to the storage of the numerical digits of a particular exchange designation in said set of registers for marking certain of the bank contacts of said hunting switch, means operative responsive to said marking for operating said hunting switch to find said marked bank contacts, thereby to translate the stored numerical digits into alphabetical markings indicative of the said exchange name, and means operated responsive to said translation for selectively operating said record producing device in accordance with said markings, whereby said record producing device is operated to make entries upon an associated record of the alphabetical letters of said exchange name.

11. In a telephone system, a set of registers, each of said registers comprising a plurality of relays adapted to be variably operated in accordance with different numerical items, means for variably operating the relays in said set of registers, thereby to store therein a plurality of variable numerical items of record information pertaining to a telephone connection dialed by a calling subscriber, means operated responsive to the registration of certain of the items of record information for translating said items from numerical items into alphabetical items, and means including a recorder automatically operated responsive to said translation for producing a record of the alphabetical and numerical items of record information.

12. In a telephone system, a first set of registers, a second set of registers, means for variably operating said first and said second set of registers in accordance with different numerical values dialed by a calling subscriber thereby to store items of record information pertaining to a telephone connection, means operated responsive to the operation of said sets of registers for translating the numerical values stored in said first set of registers into markers indicative of alphabetical letters, and means operated responsive to said translation for recording in certain spaces provided on a preformed ticket individual to the telephone connection the alphabetical letters determined by the markings by said translating means and for recording in certain other spaces provided on said preformed ticket the numerical values stored in said second set of registers.

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