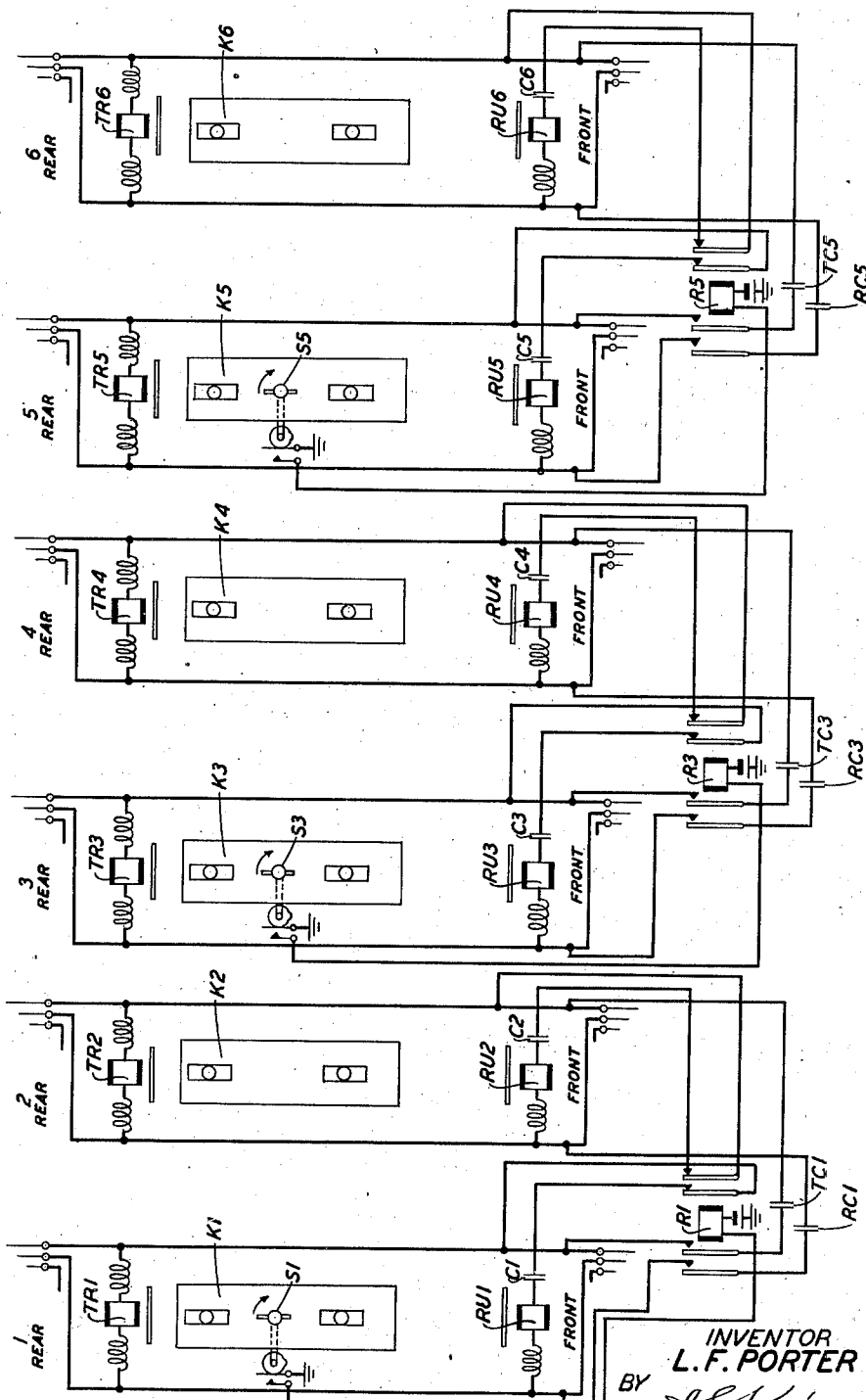


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SWITCHBOARD SYSTEM

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SWITCHBOARD SYSTEM

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4 Claims. (Cl. 179-41)

This invention relates to telephone switchboards and more particularly to a method and means for converting the cord circuits of a toll switchboard, normally arranged for the direct interconnection of two ring-down toll lines or a toll line and a direct current supervision trunk circuit, but not two trunk circuits, to permit the operative interconnection of two such trunk circuits.

A feature of the invention resides in the provision of operator controlled means associated with one of two adjacent cord circuits for disconnecting the alternating current ring-up relays usually in bridge of each of the two cord circuits and connecting a condenser between the two tip conductors of the adjacent cords, and another condenser between the corresponding two ring conductors, whereby a direct current supervision interconnecting circuit for two trunk circuits is provided between the so-called rear or trunk plugs of the two cord circuits. When two cord circuits are so converted and connected their front cords remain idle.

The drawing shows the normal complement of cord circuits, 1 to 6, inclusive, usually provided at a so-called CLR (combined line and recording) toll operator's position which cords are arranged to be converted under control of the operator in accordance with the present invention, the normal circuit condition of which (unoperated condition of the operator's control means), being the arrangement usually provided at such operator's position, i. e., cords each having one direct current trunk supervision relay (TR1, etc.), and one alternating current ring-up relay (RU1, etc.), in series with a condenser, bridged thereacross, together with other well-known circuit arrangements not shown such as talk and ringing key apparatus and circuits, supervisory lamp circuits, etc., which have no direct relation to the present invention.

With further reference to the drawing, manually operated conversion switches S1, S3 and S5 are mounted on the face plates of the key assemblies K1, K3 and K5 of cord pairs 1, 3 and 5, and switching relays R1, R3 and R5 are associated with and controlled by switches S1, S3 and S5, respectively.

When these switching relays, R1 for example, are in their normal or released position, i. e., when the contacts of switch S1 for example are not closed, the associated ring-up relays RU1, etc. are connected in bridge of their associated cord circuits in series with the corresponding condensers C1, C2, etc., over contacts of the respective R re-

lays, as for example R1 for cords 1 and 2, R2 for cords 3 and 4, etc.

As before-mentioned when the foregoing described condition exists, i. e., the unoperated condition of switches S1, S2, S3, and relays R1, R2 and R3, the cord circuits are conditioned for use in the usual manner, i. e., for answering either a trunk or toll line with the rear cord and extending a calling trunk to a toll line or a calling toll line to a trunk, or another toll line, by means of the front cord of the pair, but due to the fact that each cord circuit has only one direct current supervision relay (TR1 for example) in bridge thereto it is not practicable to connect two trunks together for the reason that only one supervisory signal relay is provided.

In case it is desired to interconnect two trunk circuits, both of which are of the direct current supervision type, the operator will answer with the rear cord of one of two adjacent idle cord pairs, cord pair 1 for example, and after operating the associated switch S1 associated with that cord pair proceed to extend the connection to the called trunk over the rear cord of cord pair 2.

When switch S1 is operated relay R1 operates and opens its right-hand contacts thereby disconnecting the bridged ring-up relays RU1 and RU2 from their normal connection across their respective cord circuits, for the purpose of removing all unnecessary bridges from the cords to prevent any possible effect on transmission.

Operation of relay R1, for example, also connects, over its left-hand contacts, a condenser TC1 between the tip conductor of cord pair 1 and the tip conductor of cord pair 2 and also a second condenser RC1 between the ring conductors of the same two pairs of cords.

From the foregoing it will therefore be noted that with switch S1, for example, operated, a speech transmission path extends from the rear plug of cord pair 1 over the left-hand contacts of relay R1 and condensers TC1 and RC1 to the rear plug of cord pair 2, but these condensers prevent direct current flowing from one rear cord to the other and hence when the two trunks are interconnected in this manner the direct current supervisory relay TR1 will be controlled over the trunk connected to the rear plug of cord pair 1 and relay TR2 over the trunk connected to the rear plug of cord pair 2.

As before mentioned when two cord circuits are converted and both rear plugs are connected to trunks, the two front cords remain idle. Although it will be noted that a trunk to trunk connection can also be established over the two-

front cords, with the two rear cords remaining idle, but under this condition, as when the rear cords only are used, the same trunk supervisory relays, i. e., TR1, TR2, for example, function to control the supervisory lamps associated with the rear cords which could be confusing to an operator when the establishment and supervision of trunk to trunk connections forms only a minor portion of her duties which principally consist in establishing connection between trunks and toll lines, or between two toll lines, which interconnections are effected by the front and rear cords of single cord circuits.

What is claimed is:

1. In a telephone system, a switchboard having a plurality of direct current supervision trunk lines and ring-down toll lines terminating thereat, two cord circuits at said switchboard, each cord circuit having front and rear cords, a direct current responsive supervisory signal device and an alternating current responsive supervisory signal device in bridge of each cord circuit intermediate the end thereof, and means for arranging said two cord circuits to permit the interconnection of two of said direct current supervision trunk lines over the two rear cords of said two cord circuits, said means comprising a pair of condensers and operator controlled switching means associated with one of said cord circuits for disconnecting the alternating current devices in both of said cord circuits and interconnecting the respective tip and ring conductors of said two cord circuits through said condensers.

2. In a telephone switchboard, an operator's position, a plurality of direct current supervision lines and a plurality of alternating current supervision lines terminating at said position, a pair of two conductor cord circuits each having

a front and a rear cord and adapted to operatively connect one of said alternating current supervision lines and one of said direct current supervision lines but not two of said direct current supervision lines, and means for arranging said pair of cord circuits to provide for the operative connection of two of said direct current supervision lines over the rear cords of said two cord circuits, said means comprising a pair of condensers and an operator controlled switch, said switch being arranged when operated to connect said condensers between the respective conductors of said two cord circuits.

3. In a telephone switchboard, an operator's position, a pair of cord circuits thereat each having tip and ring conductors, a pair of condensers associated with said pair of cord circuits and common thereto, operator controlled switching means at said position associated with and common to said pair of cord circuits adapted when operated to connect one of said condensers between the tip conductors of said two cord circuits and the other condenser between the corresponding ring conductors.

4. In a telephone switchboard, an operator's position, a plurality of double-ended two conductor cord circuits thereat, each cord circuit having a direct current supervisory relay and an alternating current supervisory relay in bridge thereto, a pair of condensers, and an operator controlled switch associated with one of two adjacent cord circuits arranged when operated to disconnect the alternating current supervisory relays from said two adjacent cord circuits, to connect one of said condensers between the tip conductors of said two adjacent cord circuits, and to connect the other condenser between the two respective ring conductors.

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