

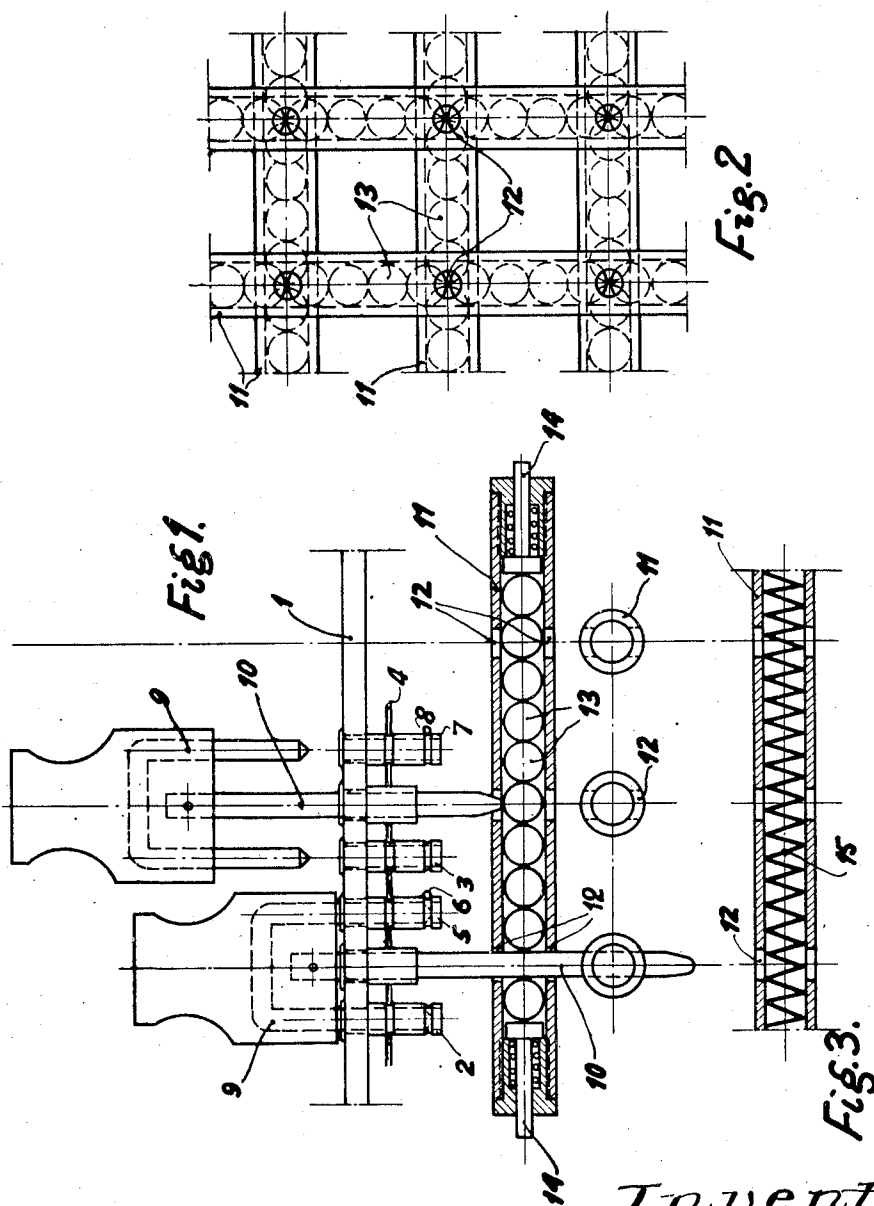
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SWITCHING DEVICE FOR DISTRIBUTION OF PROGRAMS

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SWITCHING DEVICE FOR DISTRIBUTION
OF PROGRAMS

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The present invention relates to a switching device for distribution of electric signals from one of a plurality of incoming lines to one of a plurality of outgoing lines, especially for distribution of programs in broadcasting stations and the like. The device consists of a contact field containing a plurality of conductors parallel to each other for one kind of lines and a plurality of parallel conductors, crossing the first mentioned conductors, for the second kind of lines, inter-connection between a line of the first kind and a line of the second kind being produced by means of a contact plug or the like.

Such devices are often provided with further conductors, each one corresponding to a conductor for the signal transmission and arranged adjacent to this one. Conductors of this kind are connected to each other, when corresponding conductors for the signal transmission are connected. The purpose of such connections is to obtain indications of different types, as for instance busy-line signs et cetera. The device is further provided with mechanisms which prevent the connection of more than one of the parallel conductors of one kind of lines to one and the same conductor of the second kind of lines so as not to allow that by mistake several programs may be mixed or a program distributed in an undesirable direction. In commonly known switches this mechanism comprises a rod or key which is combined with the contact plug and actuating a locking device, thus preventing further plugs to be inserted into jacks for lines which are busy.

Such switching devices grow very spacious due to the great number of conductors. As the distances between the different conductors can not be reduced unlimitedly due to the risk of cross talk between different lines, the contact plug grows rather unmanageable, as it must contain two links, each with two pins for the interconnection of the two pairs of conductors and the control rod of the locking device.

The invention eliminates these disadvantages by arranging the locking devices of the different lines electrically insulated from each other making it possible to obtain a further circuit, available for the indicating purposes, through the locking devices pertaining to the different lines by means of the metal rod of the contact plug. In this way the above mentioned extra conductors for this purpose may be deleted, which entails that the area occupied by the switching device in a plane parallel to the contact field will be reduced to only about one fourth of what was necessary for previously known switches at

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the same distance between the conductors of the fields.

A device according to the invention is illustrated in the annexed drawing, in which Fig. 1 shows a part of a switching device seen in a plane perpendicular to the contact field, Fig. 2 a part of the locking mechanism seen in the plane of the contact field and Fig. 3 an example of a contact bar with apertures for the locking rod of the contact plug, to be used, if no locking should be produced for the corresponding line.

An insulating plate 1 is provided with series of contact jacks connected to the lines. The jacks 2 and 3 are connected to a conductor 4, to which further jacks of the same kind may be connected to a horizontal row in the contact field. The contact jack 5 is together with further contacts not illustrated in the figure connected to a conductor 6 thus constituting a vertical row of the contact field. The jack 7 is in the same way together with other contacts connected to a conductor 8 constituting another vertical row.

Connection between one of the conductors for one kind of lines and one of the conductors for the second kind of lines is obtained by inserting a short-circuited two-prong link 9 in a contact plug into two jacks pertaining to each other, for instance into the jacks 2 and 5 as illustrated in the figure. The plug is further provided with a rod 10 cooperating with a locking device, so designed, that undesired communications in other parts of the contact field to the corresponding lines are prevented.

The locking device is here shown in a form known per se consisting of tubes 11, each arranged parallel with a pertaining line in the contact field and provided with apertures 12 which are placed so that the pin 10, on insertion of the plug, will be able to enter these apertures. The tubes are filled with steel balls 13 to such a number that one single pin 10 may be inserted through one of the apertures 12 as shown at the left hand plug of the figure. Spring-loaded devices 14 at the ends of the tube keep the balls in such a position in relation to the apertures that a rod may easily be inserted.

According to the invention the tubes 11 are insulated from each other and from the chassis of the switching device, for the purpose of using them as conductors for further circuits, necessary for indicating purposes or the like. Such circuits are closed by means of the rod 10.

Fig. 2 shows the arrangement of some tubes for some horizontal and vertical rows. It is to be noted that the tubes 11 which are arranged at

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right angles to each other have the apertures 12 positioned in registration or alignment with each other so that when a rod is arranged in the aligning apertures of a certain tube in each set a circuit available for indicating purposes is afforded over the locking device.

Fig. 3 shows an example of a tube pertaining to a conductor, which sometimes has to be connected to a plurality of the crossing conductors. This tube is not provided with blocking balls but with a cylindrical spring 15 or the like, producing good contact with an inserted rod. This spring does not prevent further rods from being inserted in other apertures 12 of the tube.

The invention is naturally not limited to the illustrated construction of the locking mechanism. In principle any locking device may be used, where the different parts may be arranged insulated from each other and brought into contact by means of a key cooperating with the contact device for the line conductors.

I claim:

1. A switching device comprising a contact field including a first set of parallel conductors and a second set of parallel conductors crossing the first set of conductors, a short circuiting plug, a two-point pin carried by said plug for selectively connecting the conductors of the first set with the conductors of the second set, and means to prevent the use of more than one connecting pin at a time in the contact field, said means including locking devices and a rod carried by said plug engageable with said devices, said locking devices consisting of a first set of tubes of conducting material parallel to and insulated from each other, and a second set of tubes of conducting material parallel to and insulated from each other and arranged at right angles to the first set of locking tubes and insulated therefrom, all of said

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locking tubes being provided with aligning apertures for the insertion of a rod and axially displaceable members substantially filling said tubes for preventing the insertion of more than one rod at the same time in the aligning apertures of a certain tube in each set whereby a circuit available for indicating purposes is afforded over said devices.

2. A switching device comprising a contact field including a first set of parallel conductors and a second set of parallel conductors crossing the first set of conductors, a short circuiting plug, a two-point pin carried by said plug for selectively connecting the conductors of the first set with the conductors of the second set, and means to prevent the use of more than one connecting pin at a time in the contact field, said means including locking devices and a rod carried by said plug engageable with said devices, said locking devices consisting of tubes provided with apertures for the insertion of the rod and axially displaceable members substantially filling said tubes for preventing the insertion of more than one rod at the same time in the apertures of a certain tube.

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