

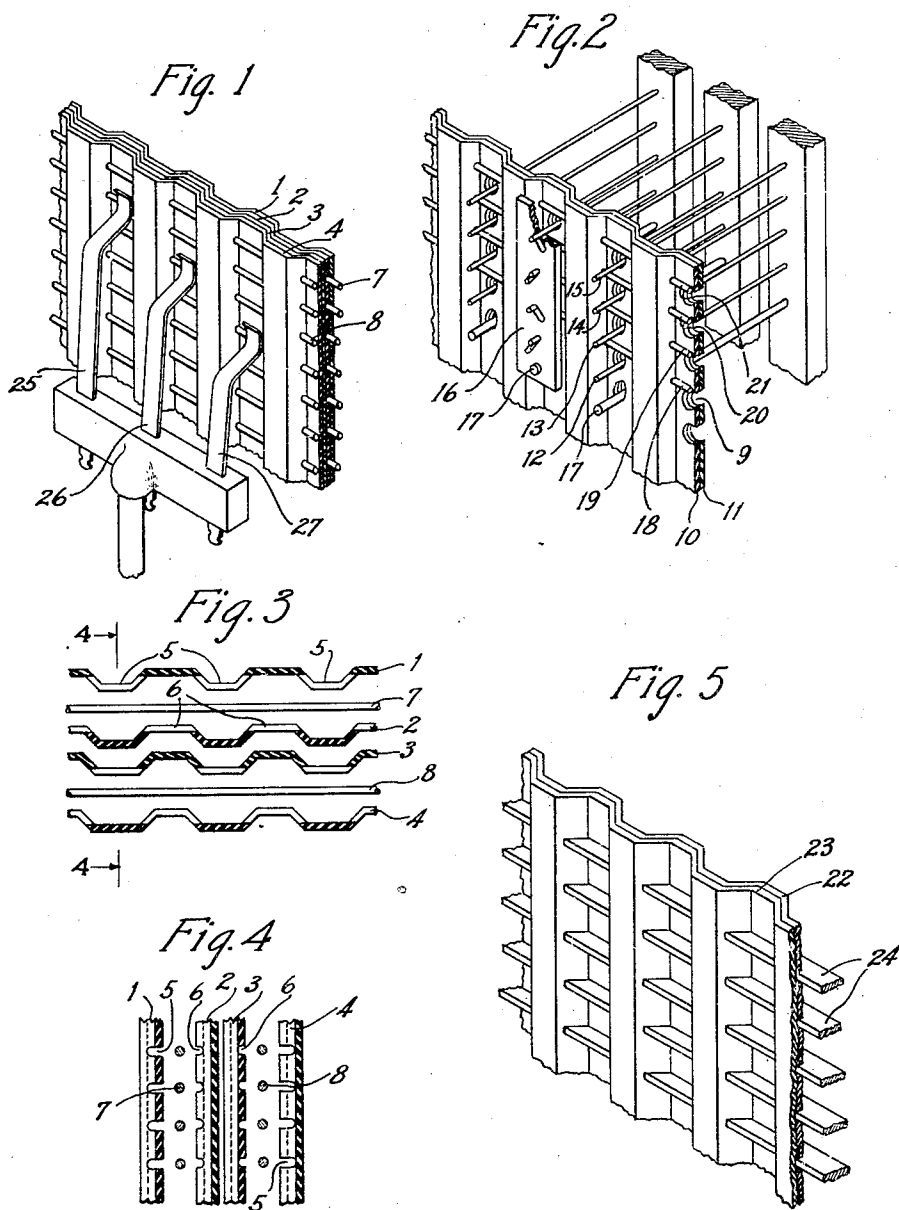
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TERMINAL BANK AND METHOD OF CONSTRUCTING IT

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UNITED STATES PATENT OFFICE.

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TERMINAL BANK AND METHOD OF CONSTRUCTING IT.

Application filed February 7, 1924. Serial No. 691,197.

This invention relates to telephone apparatus and more particularly to terminal banks for telephone switches.

Terminal banks of the panel type are well known in the art and have heretofore usually been made by superimposing alternate layers of conducting elements and insulation and compacting the structure by pressure. Banks made in this manner, particularly where they are of considerable height, have been found to vary somewhat in the vertical distance between terminals, due to uneven compression of the insulation. Considerable labor has therefore been required to properly space the terminals in the completed bank.

It is an object of the present invention to provide an improved terminal bank and method of forming the same.

A feature of the invention is the formation of a bank of spaced conducting elements held in place by means of sheets of insulation applied parallel to the surface of the bank.

A further feature of the invention lies in the provision of slots and corrugations in said sheets of insulation for positioning the conductors and for strengthening the bank.

A further feature of the invention lies in forming the bank of a plurality of semi-cured sheets of insulation and applying heat and pressure to cure the insulation and form the several sheets into a homogeneous structure.

These and other features of the invention will be more clearly understood from a consideration of the following description taken in connection with the drawings and the appended claims.

In the drawings:

Fig. 1 shows a portion of one type of terminal bank formed in accordance with the present invention.

Fig. 2 shows a portion of the same type of terminal bank adapted for use in a coordinate type switch.

Fig. 3 shows a cross-section of the elements forming a bank.

Fig. 4 shows a cross section of the elements of Fig. 3 taken along the line 4—4.

Fig. 5 is a modified form of bank also

made in accordance with the present invention.

Considering Figs. 1, 3 and 4, the sheets of insulation 1, 2, 3, and 4 may be of any suitable material which is formed in sheets and which when so formed will have sufficient rigidity. They are preferably of the type formed when canvas of fiber is impregnated by a phenol formaldehyde resin and known commercially by various trade names such as "celeron". These sheets are marketed in a semi-cured condition, in which condition they may be shaped preparatory to final curing. As a first step in the formation of a terminal bank, slots 5 and 6 are cut in the sheets and the sheets corrugated to the form shown in Fig. 3, or the sheets may be corrugated first and slotted later. It is to be noted that the slots 5 are somewhat deeper than the slots 6 for the purpose of centering the contact wires in the assembly. The wires 7, 8 are then stretched in two parallel planes in any suitable manner, the slotted sheets of insulation arranged as shown in Figs. 3 and 4 and brought together so that the wires 7 and 8 are engaged in the slots 5 and 6, and the corrugations in the various sheets engage one another. The whole is then submitted to heat and pressure whereby the semi-cured sheets of insulation are cured and formed into one laminated sheet. The bank so formed is strengthened horizontally by the wires forming the contacts and vertically by the corrugations in the insulation. The surface presented by the cured insulation is smooth and the method of forming the bank transversely holds the contact wires in place so that there is no vertical displacement due to the pressure used in finishing the bank. This form of terminal bank is particularly adapted for use with the type of switch disclosed and claimed in U. S. Patent 1,375,230 granted April 19, 1921, to J. N. Reynolds or with that disclosed and claimed in U. S. Patent 1,122,642 granted December 29, 1914, to J. N. Reynolds but may easily be used with other types of switches, where the brushes engage the terminal elements as do brushes 25, 26 and 27. As the terminal bank is double faced two sets of switches may

be used therewith the brushes of one engaging the wires 8 on one face of the bank and of the other engaging the wires 7 on the opposite face of the bank.

5 The method in which this terminal bank may be adapted for use with the coordinate switch, such as is disclosed and claimed in the patent to J. N. Reynolds, No. 1,507,140, granted September 2, 1924, is shown in Fig.

10 2. The bank is formed with a single row of conductors arranged in groups and two sheets of insulation. Perforations 9 are formed in the sheets 10 and 11 at the same time that the slots such as 5 and 6 are formed
15 therein. These perforations are so located with respect to the slots that when the bank is assembled and the conductors in place one edge of each conductor is exposed. The sets of movable conductors 12, 13, 14, 15 are ar-
20 ranged with their tips projecting through the perforations in the bank and through the guide card 16, which is also of insulation and provided with angular slots. The rod 17
25 also extends through an aperture in the bank 10, but is firmly fastened to the guide card so that upon movement of said rod, the card will be elevated and the movable conductors brought into contact with the fixed conduc-
30 tors 18, 19, 20, 21 with a transverse rubbing motion. The operation of this type of switch is set forth in detail in the above identified Patent 1,507,140 to J. N. Reynolds.

The modification of the invention shown in Fig. 5 differs from that of Fig. 2 only in
35 having the conductors in the form of strips instead of wires. Two sheets of insulation 22, 23 are slotted and corrugated in a manner similar to sheet 1 as shown in Fig. 3. The strips of metal 24 project on both sides
40 of the panel when formed and serve as contacts on both sides thereof. A particular advantage of this type of panel is its strength, the mounting of the contact strips perpendicular to the bank serving to strengthen the
45 bank transversely as well as horizontally. Another method of forming this latter type of bank, might consist in combining the corrugating slotting and assembly operations. In carrying out this method a pair of toothed
50 drums are used for corrugating the sheets of insulation provided with circumferential grooves at the desired intervals. The contact strips are fed through the grooves and the sheets of insulation are fed between the
55 drums on either side of the strips. As the sheets and strips progress through the drums the edges of the strips shear into the corrugations formed in the strips resulting in their embedding themselves between the
60 sheets. The assembled sheets and strips are then passed between heated drums and subjected thereby to pressure and heat.

What is claimed is:

65 1. A terminal bank comprising a plurality of corrugated sheets of insulating material, a

plurality of parallelly disposed conductors and means for supporting said conductors in spaced relation in said corrugations.

2. A terminal bank comprising corrugated and laminated sheets of insulating material
70 and a plurality of parallelly disposed conductors supported in spaced relation in said corrugations.

3. A terminal bank comprising a plurality of corrugated sheets of fiber impregnated
75 with a phenol formaldehyde resin and a plurality of parallelly disposed conductors supported in spaced relation in said corrugations.

4. A terminal bank comprising a plurality of corrugated sheets of fiber impregnated
80 with a phenol formaldehyde resin and parallelly disposed strips of metal supported in spaced relation in said corrugations.

5. A terminal bank comprising a plurality of corrugated sheets of fiber impregnated
85 with a phenol formaldehyde resin and a plurality of parallelly disposed strips of metal supported in spaced relation in said corrugations with their faces perpendicular to the
90 faces of said sheets.

6. A terminal bank comprising a plurality of spaced horizontal conductors and a plu-
95 rality of sheets of insulating material coextensive with said terminal bank and provided with slotted corrugations in which said conductors are supported.

7. A terminal bank comprising a plurality of corrugated sheets of insulating material,
100 transverse slots in said corrugations and conductors supported in parallel spaced relation in said slots.

8. A terminal bank comprising a plurality of corrugated sheets of fiber impregnated
105 with a phenol formaldehyde resin, parallel transverse slots in said corrugations and conductors supported in spaced relation in said slots.

9. A terminal bank comprising a plurality of corrugated sheets of fiber impregnated
110 with a phenol formaldehyde resin, parallel transverse slots in said corrugations, a plurality of flat strips of metal engaging said slots and supported thereby in spaced rela-
115 tion and with their faces perpendicular to the face of the bank.

10. A method of forming a terminal bank consisting in corrugating and slotting a plu-
120 rality of sheets of insulating material, disposing a plurality of conductors in parallel spaced relation to each other, disposing said sheets of insulating material with said conductors engaging the slots of said sheets and compacting the whole by means of heat and
125 pressure.

11. A method of forming a terminal bank consisting in corrugating and slotting a plu-
130 rality of sheets of fiber impregnated with a phenol formaldehyde resin in a semi-cured condition, disposing a plurality of conduc-

tors in parallel spaced relation to each other, disposing said sheets of impregnated fiber with said conductors engaging the slots therein, compacting the whole and curing the impregnating resin.

12. A method of forming a terminal bank consisting in corrugating and slotting a plurality of sheets of fiber impregnated with a plastic insulating compound, disposing a

plurality of strips of metal in parallel spaced relation to each other, arranging said impregnated sheets with said strips engaging the slots in said sheets and curing said impregnated sheets together.

In witness whereof, I hereunto subscribe my name this 2 day of February, A. D., 1924.

EDGAR W. GENT.