

July 8, 1941.

R. C. DEHMEL

2,248,044

TRANSPOSITION INSULATOR

Filed Feb. 21, 1939

2 Sheets-Sheet 1

FIG. 1

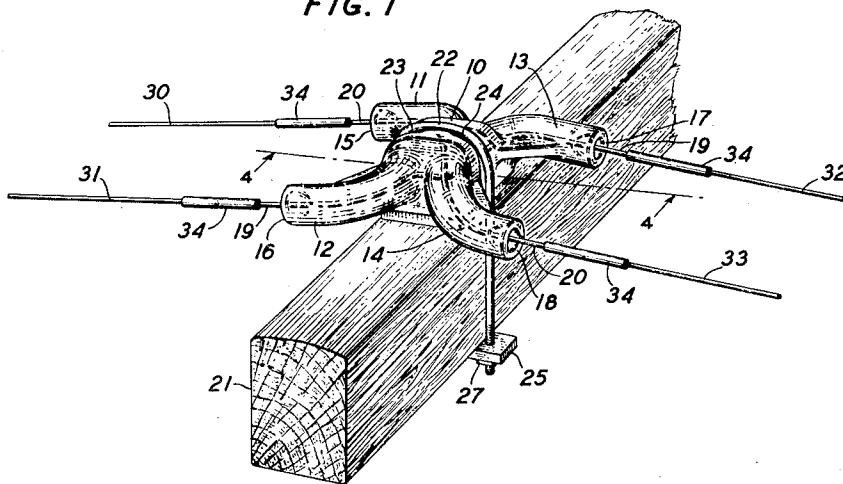
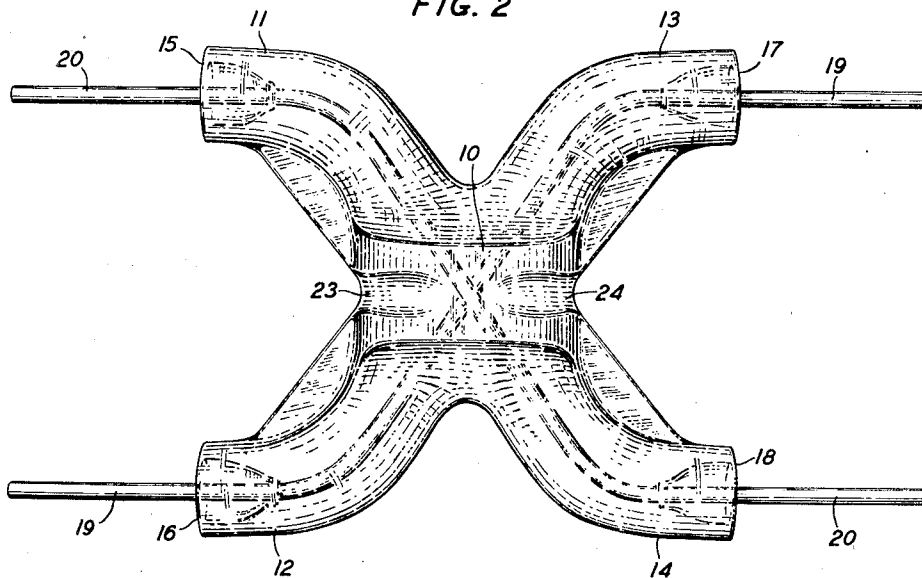


FIG. 2



INVENTOR
R. C. DEHMEL
BY *J. MacDonald*
ATTORNEY

July 8, 1941.

R. C. DEHMEL

2,248,044

TRANSPPOSITION INSULATOR

Filed Feb. 21, 1939

2 Sheets-Sheet 2

FIG. 3

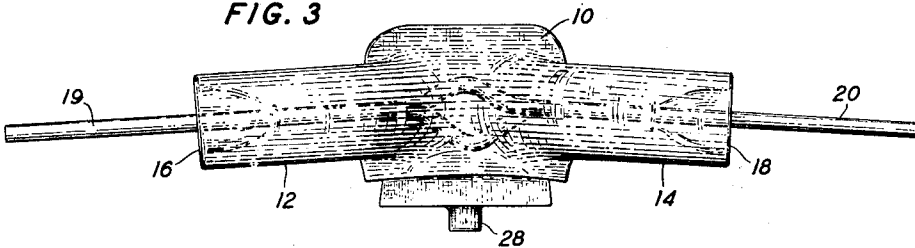


FIG. 4

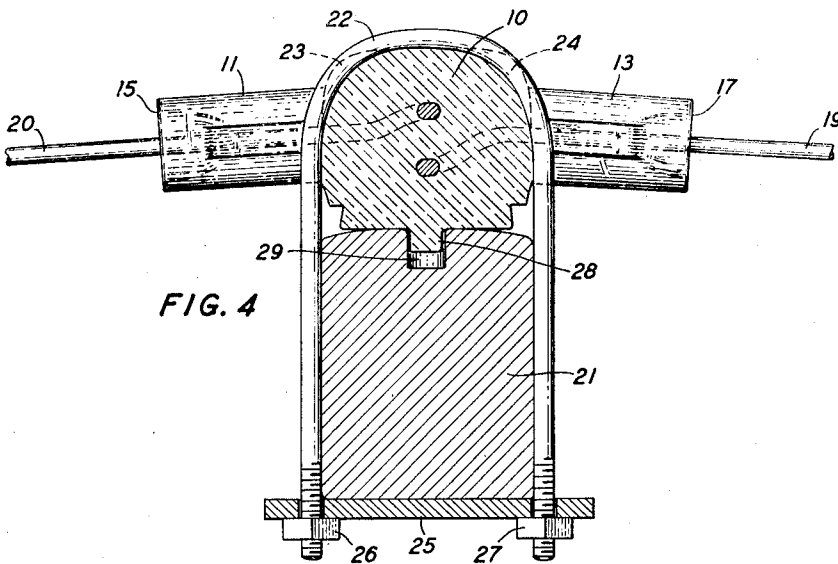
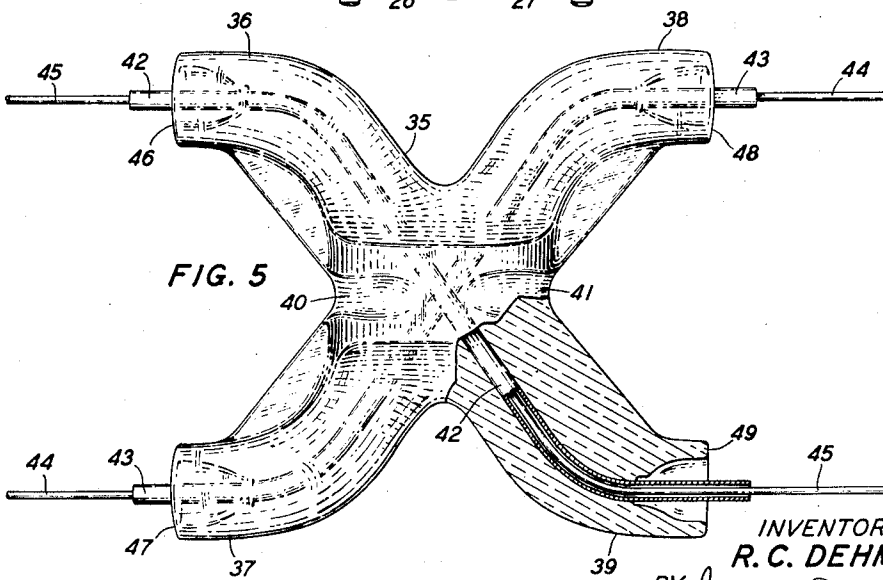


FIG. 5



INVENTOR
R. C. DEHMEL
BY *J. MacDonald*
ATTORNEY

UNITED STATES PATENT OFFICE

2,248,044

TRANSPPOSITION INSULATOR

Richard C. Delmsel, Los Angeles, Calif., assignor
to Bell Telephone Laboratories, Incorporated,
New York, N. Y., a corporation of New York

Application February 21, 1939, Serial No. 257,599

5 Claims. (Cl. 174—33)

This invention relates to insulators and more particularly to a transposition insulator designed for use on open-wire transmission lines.

It is the object of this invention to simplify and improve the method of transposing wires used in high-quality transmission circuits by providing, in a unitary structure, means for supporting and transposing said wires.

A further object of the invention is the provision of an insulator in which the transmission or line wires are transposed on the interior thereof without coming into contact with each other.

A further object of the invention is to provide a device which permits the transposing of a pair of wires without changing the level of the line wires in the adjacent spans.

A still further object of the invention is the provision of a device which incorporates, in a unitary structure, the means for supporting a pair of wires at a cross-arm in transposed relation without weakening the wires transposed.

In the construction of electrical transmission lines and in particular high-quality telephone lines, the pairs of conductors comprising such lines are transposed at intervals, in accordance with the well-known practice, to equalize the inductive effect between the conductors.

It is the general practice to support the wires of a transmission line by means of insulators mounted in definite spaced relation on the cross-arm of standing poles, the wires of the transmission line being secured to the insulators by means of tie-wires or similar devices.

Heretofore it has been the general practice to transpose such wires by substituting for the two insulators supporting the pair of line wires, a device known as a transposition bracket which comprises a metallic framework and has mounted thereon a plurality of insulators at different levels which permits the wires to be secured to the insulators and cross over each other, thereby being transposed without coming into contact with each other. This type of transposition bracket is disclosed in U. S. Patent 1,912,456 to Klein and is quite costly, inasmuch as at each transposition, four insulators, four pins, four tie-wires and the bracket itself with the necessary nuts and bolts for securing it to the cross-arm must be used. Furthermore, due to the fact that the insulators are at different levels the wires likewise will be at different levels in the span which is somewhat undesirable.

By eliminating a multiplicity of parts and providing a unitary insulating structure for the support and transposition of line wires, I have

provided an inexpensive and efficient device for effecting the transposition of transmission line wires and the like.

In the preferred form of my invention a pair of suitable preformed wires are embedded in a block of insulating material. These wires cross over each other and are spaced apart to prevent contact with each other. The ends of these embedded wires extend a short distance beyond the insulating material to permit the line wires to be secured thereto by any suitable means, for example, a rolled sleeve. In my modified form of insulator, I have embedded in the block of insulating material a pair of preformed metallic tubes. These tubes, like the wires of the insulator referred to above, cross over each other, are spaced apart to prevent contact and extend a short distance beyond the insulating material. When using this type of transposition insulator, the wires to be transposed are threaded through the embedded tubes to effect the cross-over and transposition and no cutting of the wires is necessary.

The features of the invention will be readily understood from the following detailed description made with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view of the preferred form of my insulator secured to a cross-arm with the line wires secured to the extending portions of the embedded wires;

Fig. 2 is a plan view of the insulator shown in Fig. 1;

Fig. 3 is a side view of the insulator shown in Fig. 2;

Fig. 4 is a view in cross-section taken on line 4—4 of Fig. 1; and

Fig. 5 is a plan view, partly in section, of a modified form of insulator.

The insulator of this invention may be made of glass or any other suitable insulating material, which may be readily molded around a plurality of wires or tubes.

As shown in Figs. 1 and 2, the insulator comprises a body portion 10 and four extending arms 11, 12, 13 and 14 which are cast or molded integral with the body portion 10, as shown in Figs. 3 and 4 and are in the same plane. The ends of these arms are provided with recessed portions 15, 16, 17 and 18 to permit some movement of the wires without damaging the insulator or weakening the wires at this point and to reduce surface leakage. Embedded in the insulator and extending out some distance beyond the petticoats 15, 16, 17 and 18 in the arms 11,

12, 13 and 14 are the preformed wires 19 and 20. As shown in Figs. 2, 3 and 4, these wires cross over each other on the interior of the insulator and are spaced some distance apart.

As shown in Figs. 1 and 4, the insulator is secured to the cross-arm 21 by means of a U-bolt 22 which engages the grooves 23 and 24 on the top of the insulator, passes down on each side of the cross-arm 21 and is fastened thereto by means of the plate or yoke 25, which has apertures therein through which the threaded ends of the U-bolt 22 pass. The yoke 25 is forced tightly against the bottom of cross-arm 21 by means of the nuts 26 and 27. In order to prevent movement between the insulator and the cross-arm, there is located on the under side of the body portion 19 of the insulator, a boss or lug 22 which is arranged to fit into the aperture 29 on the cross-arm. (See Figs. 3 and 4.)

In the preferred form of my insulator, as shown in Figs. 1 to 4, inclusive, the line wires may be secured to the projecting ends of the wires by any suitable means. However, for the purpose of illustration, I have joined the wires 30, 31, 32 and 33 to the extending ends of the embedded wires by means of the metallic sleeve 34, which may be applied either by rolling or by compression.

In the modified form of my insulator, shown in Fig. 5, the structure of the insulator is substantially the same as that heretofore described in that it comprises a body portion 35, four extending arms 36, 37, 38 and 39 and the grooves 40 and 41. However, in the modified insulator I have not embedded two preformed wires but have molded two preformed metallic tubes 42 and 43, the inside diameter of which is of such a size to permit the passage therethrough of hard drawn copper line wires 44 and 45, which in the installation of new lines may be transposed without cutting the wires or weakening them in any way. The tubes 42 and 43 like the wires 19 and 20 in the insulator shown in Figs. 1 to 4, inclusive, extend some distance beyond the petticoats 46, 47, 48 and 49 in the arms 36, 37, 38 and 39 to permit some movement of the wires and tubes at this point without injuring either the wires or the insulator.

The modified form of insulator shown in Fig. 5 is secured in the manner described with reference to the securing of the insulator shown in Figs. 1 to 4, inclusive.

It will be noted in both types of insulator the wires are transposed and mounted in a definite spaced relation and that the tensile strength of the wire is not impaired due to sharp angles or bends.

While there is shown and described herein the preferred embodiment of my invention, it is un-

derstood that it is not limited or confined to the precise details of construction herein described as various modifications may be made without departing from the spirit of the invention and I am only limited by the scope of the appended claims.

What is claimed is:

1. An insulator for supporting transmission wires in transposed relation, comprising a body of molded insulating material, a plurality of diagonally disposed arms integral with said body portion, said body and arms having embedded therein a plurality of metallic members, said members being spaced apart, crossing one over the other, and having their ends protruding beyond the ends of said arms.

2. An insulator for supporting transmission wires in transposed relation, comprising a body of molded insulating material, a plurality of diagonally disposed arms integral with said body portion, said body and arms having embedded therein a plurality of spaced apart metallic tubes, crossing one over the other and having their ends protruding beyond the ends of said arms.

3. An insulator for supporting transmission line wires in transposed relation, comprising a body of molded insulating material, a plurality of diagonally disposed arms integral with and extending from said body, a plurality of spaced apart metallic members embedded in said body and crossing one over the other, said arms being located all in the same plane and having portions of said metallic members embedded therein and having their ends extending a short distance beyond the ends of said arms.

4. An insulator for supporting transmission line wires in transposed relation, comprising a body of molded insulating material, a plurality of diagonally disposed arms integral with and extending from said body, said arms located all in the same plane and having recesses in the ends thereof and a plurality of spaced apart metallic tubes embedded in said body and in said arms, said tubes crossing one over the other and extending a short distance beyond the ends of said arms.

5. An insulator for supporting transmission line wires in transposed relation comprising a body of molded insulating material, a plurality of diagonally disposed arms integral with and extending from said body all in the same plane, a reinforcing fin on said arms, a plurality of metallic members embedded in said body, said members being spaced apart, crossing over each other in the body portion of the insulator and having portions thereof embedded in said arms and extending a short distance beyond the ends thereof.

RICHARD C. DEHMEL.