Feb. 22, 1949. N. E. LINDENBLAD 2,462,410

FOLDED TRANSMISSION LINE

Original Filed Sept. 24, 1942

Fig. 1.

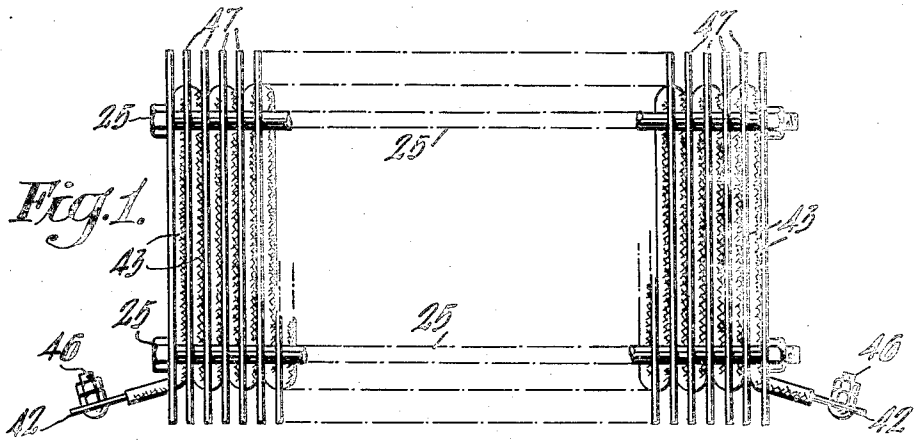


Fig. 2.

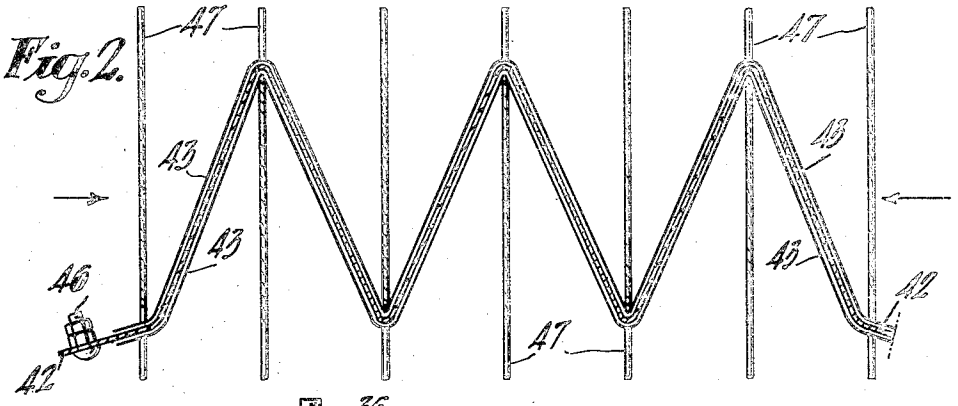
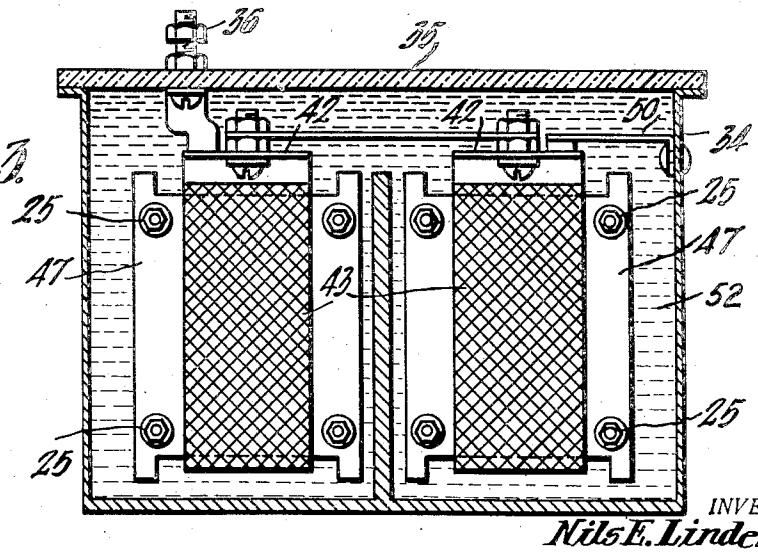


Fig. 3.



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FOLDED TRANSMISSION LINE

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6 Claims. (Cl. 178—44)

1

This application is a division of my previous application Number 459,497, filed September 24, 1942.

The present invention relates to electrical circuits having characteristics similar to those of transmission lines.

An object of the present invention is the provision of an artificial line having uniformly distributed characteristics.

Another object of the present invention is the provision of an artificial line which is compact in size.

Still another object of the present invention is the provision of an artificial line having a low characteristic impedance.

Still another object of the present invention is the provision of an artificial line having characteristics which do not vary with changes in the frequency of energy applied thereto.

A further object of the present invention is the provision of an artificial line which has a phase shift characteristic which is linear with respect to frequency.

Still a further object of the present invention is the provision of a compact artificial line which, in spite of its size, will handle large amounts of energy.

The foregoing objects, and others which may appear from the following detailed description, are attained in accordance with the principles of the present invention by so folding a natural line that it occupies a small space without at the same time introducing such mutual inductive effects, either electrostatic or electromagnetic, between different layers of the folded line that it ceases to act as a natural line.

The present invention will be more fully understood by reference to the following detailed description, which is accompanied by a drawing in which Figure 1 illustrates an embodiment of the invention, while Figure 2 illustrates an exploded view of a part of Figure 1, while Figure 3 illustrates a modification of the invention.

The embodiment of the present invention, shown in Figure 1, employs a plurality of generally H-shaped metal plates **47** having a conductor strip or ribbon **42** laced in a zig-zag manner between the plates. The conductor strip is covered with insulating material **43** which may be in the form of flat strips of cloth or the like on either side of the ribbon **42**. Alternatively the ribbon may be covered with an insulating sleeving woven over the ribbon. The plates **47** are maintained in close pressed relationship against the conductive ribbon **42** by means of

2

bolts **25** passing through suitable apertures in the plates **47**.

Figure 2 illustrates an exploded view of a portion of Figure 1, illustrating more clearly the manner in which the conductor **42** is folded back and forth in a zig-zag manner between the conductive ground plates **47**. Each end of conductive ribbon **42** is provided with terminal bolts **46** for connection to the desired utilization apparatus.

A modification of the present invention, shown in Figure 3, includes a plurality of the artificial line units as described above connected together and placed in a metallic casing **34**. The casing **34** may be filled with transformer oil **52** whereby the insulation between successive elements of the conductor may be improved. Furthermore, the presence of the insulating oil enhances the cooling of the artificial line and thus permits the use of higher power. The conductive casing **34** is closed with an insulating top **35** bearing a terminal **36** which is connected to one end of ribbon **42** of one of the sections within the casing. The other end of the ribbon may be grounded to the casing by means of ground strip **50**.

While I have particularly shown and described several modifications of the present invention, it should be clearly understood that the invention is not limited to these forms alone, but that modifications may be made.

What is claimed is:

1. An artificial line including a plurality of spaced metallic plates having an elongated conductor folded in zig-zag manner between said plates and insulating means between said plates and said conductor, and means for clamping said plates firmly against the successive folds of said conductor.

2. An artificial line wherein a number of assemblies as set forth in claim 1 are connected in series and immersed in an insulating fluid.

3. An artificial line wherein a number of assemblies as set forth in claim 1 are connected in series and immersed in insulating fluid, said plates being connected together to a point of zero reference potential.

4. An artificial line including an elongated conductor having insulating sleeving woven about said conductor, said conductor being folded back and forth in a zig-zag manner so as to occupy a restricted space and conductive shield plates between the successive folds of said conductor to reduce the mutual effects between said elements.

5. An artificial line wherein a number of assemblies of lines as set forth in claim 1 are con-

nected in series and immersed in an insulating liquid.

6. An artificial line wherein a number of assemblies of lines as set forth in claim 1 are connected in series and immersed in insulating liquid, said plates being connected together to a point of zero reference potential.

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The following references are of record in the file of this patent:

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Number	Name	Date
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