March 14, 1933. J. R. VEZEY 1,900,962

CONTINUOUSLY LOADED TELEGRAPH CABLE

Filed Aug. 22, 1930

FIG. 1

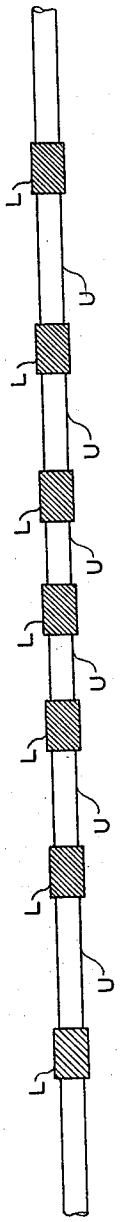


FIG. 2

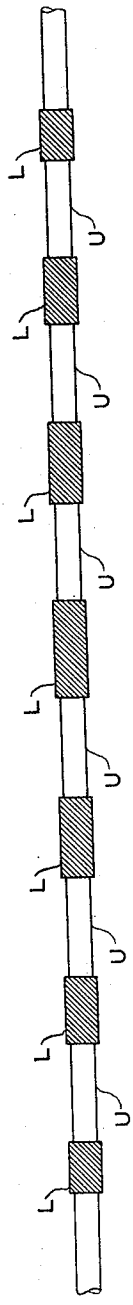
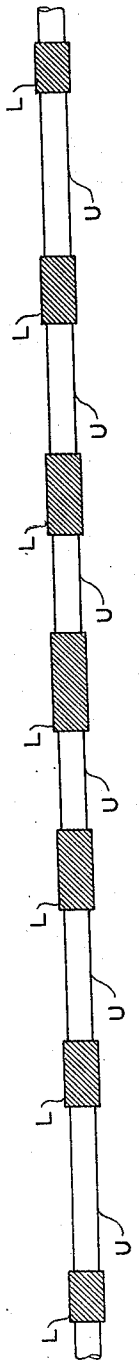


FIG. 3



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Patented Mar. 14, 1933

1,900,962

UNITED STATES PATENT OFFICE

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CONTINUOUSLY LOADED TELEGRAPH CABLE

Application filed August 22, 1930, Serial No. 477,149, and in Great Britain September 18, 1929.

This invention relates to loading systems for submarine cables and is particularly applicable to telegraph cables.

In existing telegraph cables of the deep sea type with the employment of high permeability material for continuously loading the cable conductors, it has been possible to work simplex successfully at reasonable speeds but up to the present satisfactory duplex working was difficult to attain due mainly to the difficulties of designing an artificial line having the characteristics of the cable.

The present invention provides a cable loading system which has many advantages over existing types and which may be more readily balanced or simulated by an artificial line.

A method of loading systems is disclosed in British Patent 201,931 of 1923 in which Figs. 4 and 5 show forms of loading by applying a helical tape of permalloy to the conductor. This form of loading may be applied in the present instance.

Broadly the invention comprises a submarine cable for alternate loaded sections and non-loaded sections as shown in the drawing wherein the loading decreases from the centre of the cable towards the ends by varying uniformly the length of either or both sections. In the preferred embodiment, the cable comprises alternate sections of two different types, in one type the conductors being continuously loaded with a high permeability material and the other type being non-loaded. At the centre of the cable the loaded sections occupy a certain proportion of the length of the cable and from this point advancing to each end, the proportion of the loaded sections to the non-loaded sections is gradually decreased. My invention is illustrated in Figs. 1, 2 and 3 wherein various modifications are shown.

In one embodiment of the invention as shown in Fig. 1, the loaded sections are of substantially uniform length, but the interval between the loaded sections being gradually increased from the centre towards the ends of the cable.

In another embodiment as shown in Fig. 2 the length of the loaded sections is varied to give a similar gradation in loading towards the end of the cable, or as a further alternative as shown in Fig. 3 both the length of the loading sections and the non-loading sections are varied uniformly to give the gradation. In the various figures the sections L in shaded lines show the arrangement of the sections loaded as illustrated in the British patent to which reference is made. Any other form of loading may, however, be employed. The unloaded sections are shown at U in the various figures.

By following the above particulars it is possible to obtain a cable wherein the change of inductance from one end to the other is very gradual throughout, the loading gradually increasing from one end of the cable to the centre and decreasing from the centre to the other end of the cable.

The determination of the exact lengths of the different sections used throughout the cable depends upon the length of the cable and upon the degree of uniformity desired, having regard to the expense of manufacture. It would be convenient, for example, to choose for the loaded sections a standard manufacturing length and to choose the intermediate sections of non-loaded cable to be multiples or sub-multiples of a manufacturing length of non-loaded cable. Thus, for example, the centre of a cable may be comprised by single manufacturing lengths of loaded cable alternating with sections of non-loaded cable whose lengths are two manufacturing units or lengths. Further from the centre of the cable the latter may be comprised by sections of loaded cable of the same length as before alternating with sections of non-loaded cable whose lengths would be four manufacturing units, this gradation could be continued to the ends of the cable which would be preferably non-loaded.

Since the particular choice of grading would depend largely upon commercial considerations, in some cases it may be desirable to vary the loaded sections in lengths gradually decreasing towards the end of the cable and with such an arrangement either to keep the non-loaded sections constant or to vary

them also in accordance with the above principles.

What is claimed is:

1. A submarine cable comprising alternate loaded sections and unloaded sections, the length of which are varied in such manner that the loading decreases from the center of the cable toward the end.

2. A submarine cable comprising alternate loaded sections and unloaded sections wherein the length of the unloaded sections is gradually increased toward the ends of the cable whereby the loading is gradually decreased.

3. A submarine cable as claimed in claim 2 wherein a graduation in loading is effected by decreasing the length of the loaded sections from the center of the cable toward the ends.

4. A submarine cable comprising a plurality of loaded sections and a plurality of unloaded sections, wherein one loaded section is joined to another loaded section by one of the unloaded sections, and the length of loaded sections is progressively less toward the end of the cable.

5. A submarine cable comprising a plurality of loaded sections and a plurality of unloaded sections, wherein the length of loaded sections is progressively less toward the end of the cable and the length of non-loaded sections is constant.

6. A submarine cable comprising a plurality of loaded sections and a plurality of unloaded sections, wherein the length of loaded sections remains constant and the length of unloaded sections is progressively greater toward the end.

7. A submarine cable comprising a plurality of loaded sections and a plurality of unloaded sections, wherein the length of loaded sections is progressively less toward the end and the length of unloaded sections is progressively greater toward the end.

8. A submarine cable comprising a plurality of loaded sections and a plurality of unloaded sections, wherein both the length of loaded and unloaded sections are progressively less toward the end.

In witness whereof, I hereunto subscribe my name this 18 day of July, 1930.

JOHN RICKETTS VEZEY.