

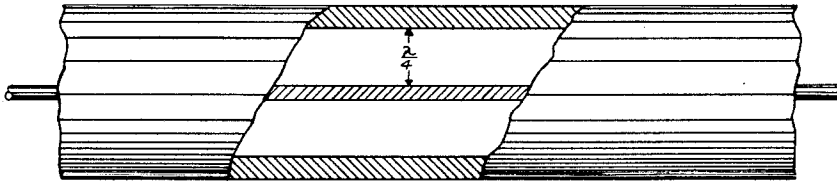
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MICRORAY TRANSMISSION LINE

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MICRORAY TRANSMISSION LINE

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4 Claims. (Cl. 178—44)

This invention relates to micro-ray transmission lines, that is, to transmission lines for use in micro-ray signaling systems.

By micro-ray is meant electromagnetic waves lying, generally, in the range between 1 and 100 centimeters.

In my U. S. Letters Patent No. 1,928,408, I have disclosed a complete signaling system using micro-rays. In that patent there is also disclosed a short transmission line connecting a micro-ray tube with an antenna. That transmission line consisted of a number of sections having various lengths and various values of characteristic impedance. The transmission line in my present invention may be used in such a system, but it is also capable of use in a micro-ray signaling system employing much longer transmission lines. In fact, the transmission line of my present invention may be used for the transmission of signals over long distances, and it may also be used for a wide band of carrier waves so that many signals may be put on one line.

In the drawing:

The figure shows one species of the transmission line of this invention in which concentric conductors are used.

Considerable work has been done on the theory of the transmission characteristics of concentric conductors. However, all of this work, so far as I have been able to ascertain, has been done with wave lengths considerably longer than those employed in micro-ray systems. This is quite natural, since it is only very recently that it has been possible to produce waves in this range. This previous work on the theory of the transmission of waves over concentric conductors has postulated a space between the conductors which is very small compared to the

length of the wave under consideration. With waves of the length of micro-rays, it becomes easily possible to use conductors in which the spacing is so large with respect to the length of the waves that it may have a definite effect on the transmission characteristics of the line.

If conductors are used which are spaced apart a quarter wave length (and with a 10 centimeter wave this would mean a space of only 2.5 centimeters) and if it be assumed that any disturbance in the line travels between the conductors at the same speed as the wave travels along the conductors, it will be seen that any disturbance set up at any point will be reflected by the opposite conductor back to that point in phase with a succeeding wave traveling along the line. The high frequency resistance of the line will, therefore, be substantially reduced under the circumstances. It thus becomes possible, by spacing the conductors as described, to build a concentric transmission line for micro-rays which may be used to convey signals over long distances.

What is claimed is:

1. A micro-ray transmission line comprising a plurality of conductors a quarter wave length apart.

2. A micro-ray transmission line comprising a pair of conductors a quarter wave length apart.

3. A micro-ray transmission line comprising a pair of concentric conductors a quarter wave length apart.

4. A micro-ray signaling system comprising a transmission line, means for impressing a signal on said line, the conductors of said line being spaced apart a distance equal to a quarter of the wave length of said signal.

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