S. EISENSTEIN.

ELECTRIC CONNECTION FOR MULTIPLE WIRELESS TELEGRAPHY.

APPLICATION FILED NOV. 9, 1907.

950,258. Patented Feb. 22, 1910.

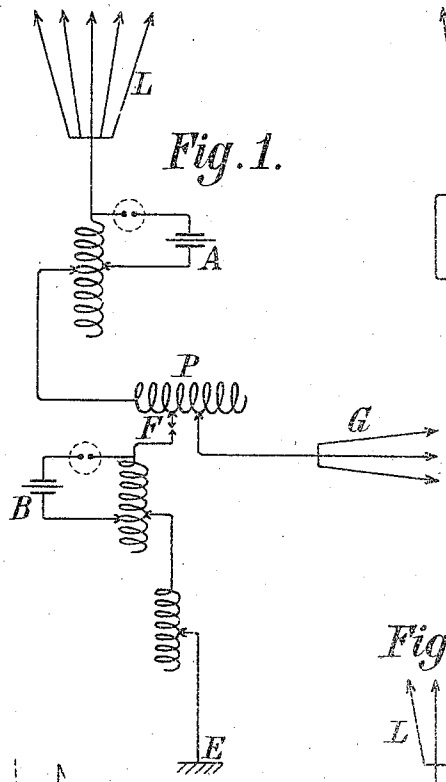


Fig. 1.

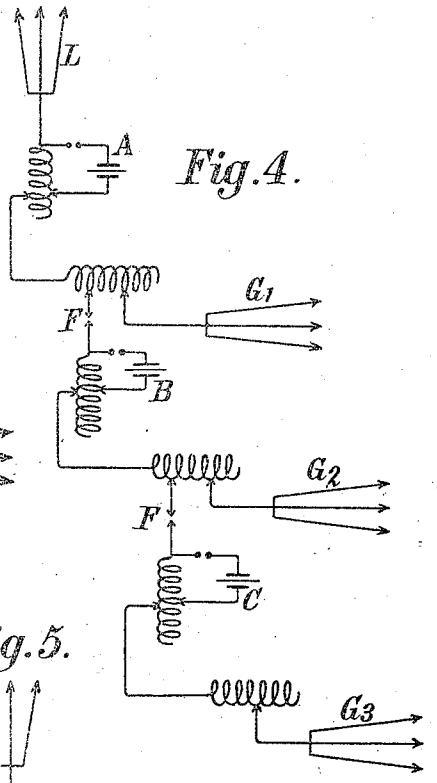


Fig. 4.

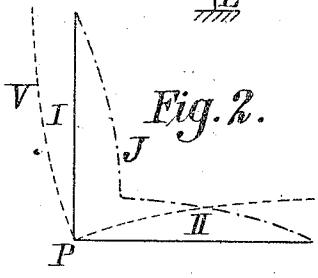


Fig. 2.

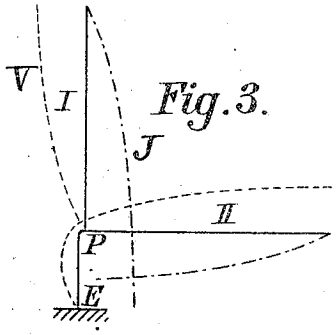
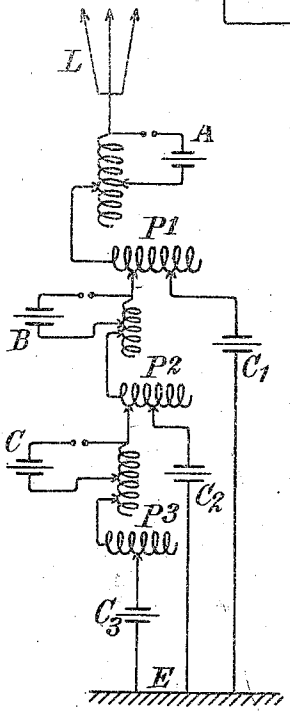


Fig. 3.

Fig. 5.



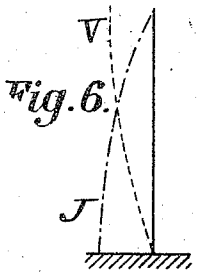


Fig. 6.

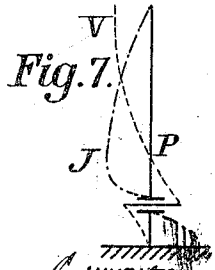


Fig. 7.

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ELECTRIC CONNECTION FOR MULTIPLE WIRELESS TELEGRAPHY.

950,258. Specification of Letters Patent. Patented Feb. 22, 1910.

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To all whom it may concern:

Be it known that I, SIMON EISENSTEIN, a citizen of the Empire of Russia, residing at No. 4 Proresnaja, Kiew, Russia, have invented certain new and useful Improvements Relating to Electric Connections for Multiple Wireless Telegraphy, of which the following is a specification.

The present invention has for its object a system of electrical connections for multiple wireless telegraphy with a small construction for the aerial conductor.

In the known systems of multiple telegraphy a multiple form of aerial conductor is usual but this, owing to the increase of the dimensions of the masts, gives rise to considerably greater expenditure of money. In accordance with the present invention the aerial conductor is constructed in a number of branches which are utilized either separately or together for despatching messages of different wave lengths, the separate branches being connected with one or more antennæ or put to earth over capacities so that as the arrangement and construction of a number of antennæ presents no difficulties, because as is known they are suspended from short rods and are readily accessible, the cost is considerably reduced.

In the accompanying drawing, Figure 1 shows diagrammatically a means of connection constructed according to the invention, Figs. 2 and 3 are diagrams illustrating the vibration of the system, Fig. 4 shows diagrammatically another form of apparatus, Fig. 5 shows a further modified form, and Figs. 6 and 7 are diagrams illustrating the action of the apparatus shown in Fig. 5.

In Fig. 1 the known vibration circuit A is in resonance with the aerial L and with the antenna G, so that by means of this system a definite wave length can be produced. As indicated in the drawing, the aerial G lies in a horizontal plane. The vibration of this system is illustrated diagrammatically in Fig. 2 in which the curve shown in broken lines represents the spacial tension, while the curve shown in mixed lines represents the strength of the current. I and II are the two branches of the aerial conductor structure. At the point P, where the junction or nodal-point of the tension is located, an additional branch of the aerial conductor structure is arranged with the vibration circuit B by the intermediary of a small sparking path F, this portion of the structure of the aerial conductor being grounded at E. The curves indicated by V indicate curves of tension, while those indicated by J indicate the strength of the current. Now as no difference of tension can exist between the earth and the point P where the nodal point of the tension of the belly of the current is located it is obvious that this earth connection must remain without any influence upon the vibrations produced in the vibration circuit A owing to the provision of the small sparking path F in the nodal point of the tension. The earth connection may therefore be regarded as non-existent for the vibrations produced by the vibration circuit A. When, however, after a short interval of time, after the vibration of the first wave which has been produced by the vibration circuit A in accordance with any known method, as already repeatedly suggested by the inventor, fresh vibrations, which may be of different wave lengths, are produced by the vibration circuit B, with this excitation the antennæ L and G must coöperate as a common antenna with the earth E. By the arrangement of the earth connection in the nodal point of the vibration tension of the horizontal antenna system of the aerial conductor, complete monotony of the vibration process of the vibrations produced by the vibration circuit B must be insured. Fig. 3 illustrates diagrammatically the vibration process of this second vibration. The branches I and II of the common antenna present the same self vibrations and in accordance with Fig. 2 the point P is selected in such a manner that the branches I and II vibrate together in a half wave length of the vibration produced by the vibration circuit A, while the branch I or the branch II regarded independently vibrate in a fourth of a wave length. In the vibration process excited by the vibration circuit A the structure of the aerial conductor therefore merely acts with the branches I and II, without the earth connection being able to exert any influence whatever, in view of the interposition of the small sparking path F, while during a vibration process succeeding the first in point of time and produced by the vibration circuit B, the antennæ L and G act as a common antenna with the earth. It is obvious with-

out further explanation that the earth connection can be replaced by a second antenna similar to the antenna G. In this case it is also easy to find the nodal point of the oscillator B and to connect a third vibration circuit.

Fig. 4 shows by way of example a method of connection for producing three waves. The arrangement is substantially the same as in Fig. 1 and the aerial L acts in common with the antennæ G^1 and G^2 as antenna and vibrates in resonance with the antenna G^3 when a wave is produced in the vibration circuit C. It is therefore obvious that a simple small aerial conductor structure may be utilized for the purpose of multiple telegraphy without entailing any strengthening or enlargement of the masts. As already stated, the construction of a number of antennæ presents no difficulties as they are suspended on small rods so that they are readily accessible. On the other hand the local conditions as regards the suspension of a number of antennæ are sometimes unfavorable. When however a good earth can be provided, the method of connection as described above may be formed by connecting condensers of equal capacity in place of the antennæ, as shown diagrammatically in Fig. 5. It must, however, be remembered that it is a known fact that an aerial conductor which vibrates with the earth has the nodal point of the tension in the earth, so that in interposing a capacity at the earth connection the nodal point itself is rendered higher. This is diagrammatically represented in Figs. 6 and 7 which illustrate the vibration process, and in conjunction with what has been stated above these figures should be readily intelligible without further description. The points P^1 P^2 P^3 in Fig. 5 of course present the same properties as the point P in Fig. 1, that is to say it should not present any tension differences and must therefore be independent of the succeeding vibration circuits. The excitation of the vibrations may of course vary largely in the present invention, and further, damped, undamped or slightly damped vibrations may be utilized without affecting the principle of the invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In wireless telegraphy, an aerial conductor having a number of branches each of which is connected with a capacity of suitable character, each of the branches being connected at certain times to the nodal point of the vibration tension of the vibration circuit for the time being, one branch having an earth connection so that in the one case in exciting such a vibration the earth connection of such branch remains completely unaffected and in the other case the aerial conductor with all its branches acts as a common antenna.

2. In wireless telegraphy, an aerial conductor divided into a number of branches each of which is connected with an antenna, each of the branches being connected at certain times to the nodal point of the vibration circuit for the time being.

3. In wireless telegraphy, an aerial conductor having a number of branches connected with suitable capacities, each of said branches being connected at certain times to the nodal point of the vibration tension of the vibration circuit for the time being, and vibration circuits having therein condensers and connecting with certain of said branches.

4. In wireless telegraphy, an aerial conductor divided into a number of branches partly connected with antennæ and partly with the earth, said branches being connected at certain times to the nodal point of the vibration tension of the vibration circuit for the time being.

5. In wireless telegraphy, an aerial conductor comprising a number of branches each connected at certain times to the nodal point of the vibration tension of the vibration circuit for the time being, certain of said branches being connected with the earth and having condensers therein.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

SIMON EISENSTEIN.

Witnesses:
ALFRED W. SMITH,
GEORGE A. APPLETON.