

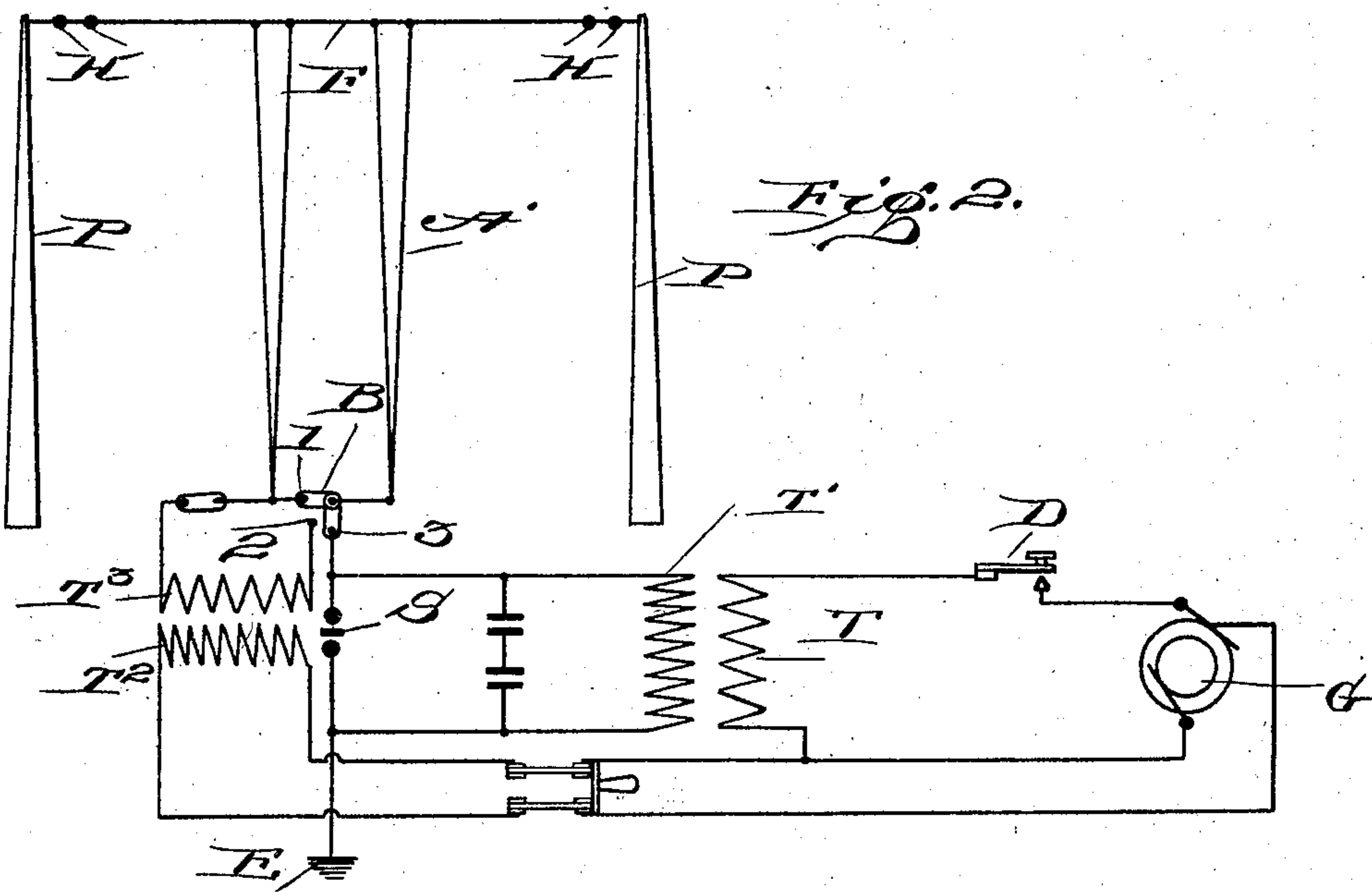
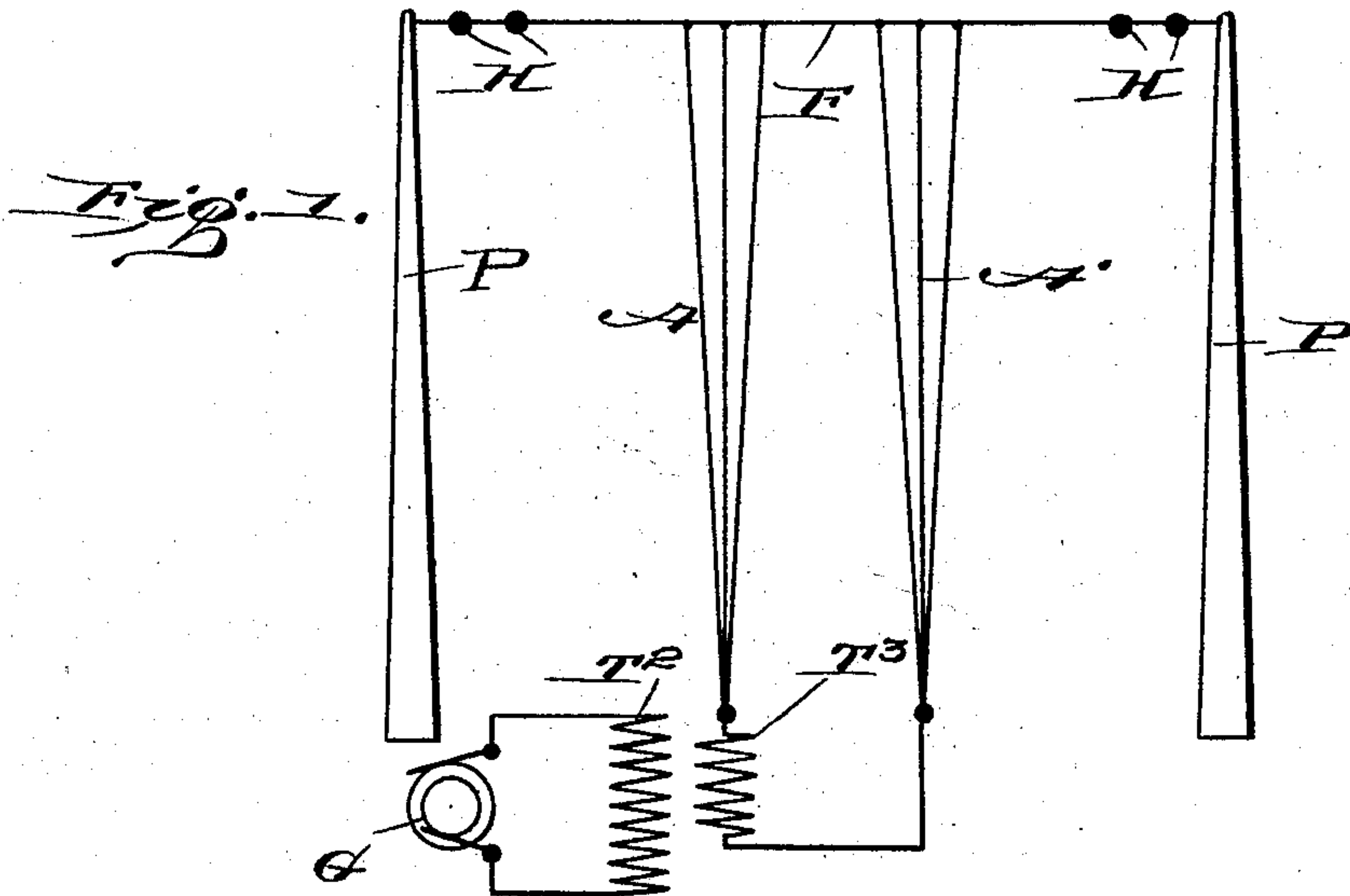
No. 750,181.

PATENTED JAN. 19, 1904

L. DE FOREST & W. G. CLARK.
DEVICE FOR CLEARING ICE FROM ANTENNAE.

APPLICATION FILED JUNE 17, 1903.

NO MODEL.



WITNESSES:

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UNITED STATES PATENT OFFICE.

LEE DE FOREST, OF NEW YORK, N. Y., AND WALTER G. CLARK, OF SEATTLE, WASHINGTON.

DEVICE FOR CLEARING ICE FROM ANTENNAE.

SPECIFICATION forming part of Letters Patent No. 750,181, dated January 19, 1904.

Application filed June 17, 1903. Serial No. 161,896. (No model.)

To all whom it may concern:

Be it known that we, LEE DE FOREST, a resident of the city, county, and State of New York, and WALTER G. CLARK, a resident of Seattle, King county, Washington, citizens of the United States, have invented certain new and useful Improvements in Devices for Clearing Ice from Antennae, of which the following is a specification.

Our invention relates to a device adapted to be used in connection with wireless signaling apparatus by which the antennae and other exposed conductors may be freed of accumulated ice and the excessive and dangerous accumulation of ice thereon be prevented.

The scope of our invention may be determined by an inspection of the claims terminating this specification.

The drawings accompanying herewith illustrate a preferred form of apparatus for carrying out our invention.

Figure 1 illustrates diagrammatically and in a simple form a mechanism embodying our invention. Fig. 2 in a similar manner represents an apparatus embodying our invention, the connection thereto of a complete sending apparatus being illustrated.

In the erection of wireless signaling apparatus in locations where they are likely to be subjected to sleet-storms the protection thereof against the weight of ice which is likely to accumulate thereon becomes a serious problem, as these conductors are of considerable length. In considering this problem we have devised an apparatus by means of which a current may be sent through the antennae or other exposed conductors of sufficient amperage to heat them above the melting-point of ice, thereby preventing the dangerous accumulation of ice thereon.

In Fig. 1, which represents a simple form of apparatus, P P represent two separating supported poles or masts, the upper ends of which are connected by means of the conductor F, which is, however, insulated from such poles by the use of insulators H. This conductor F is utilized as a direct support for the antennae A and A'. Either of the antennae are arranged in two or more groups, as is shown

in Fig. 1, or a return-conductor corresponding with one group of antennae is supplied, so that the conductors may be connected in series, so as to produce a complete circuit. The lower ends of the groups of antennae are arranged to be connected with opposite poles of a mechanism by which a large current of low voltage may be produced. The most convenient means for producing such a current and the means herein shown consists of a step-down transformer. The primary T² of the transformer is connected with a source of electromotive force, such source being shown as consisting of the alternating generator G. Terminals of the secondary of this transformer are connected with the respective group of antennae, so that when current is passed through the transformer a current of large amperage, but small voltage, will be passed through the antennae, which will result in sufficiently heating them to melt any ice which may have accumulated thereon.

The apparatus shown in Fig. 2 differs from that just described in illustrating means by which the step-down transformer may be connected with the generator employed in sending the signals when it is desired to melt ice from the terminals and at other times may be disconnected therefrom. In this figure T T' represent, respectively, the primary and secondary of a step-up transformer, which is employed for producing the electrical oscillations by the usual means, which include the spark-gap S and key D. B represents a switch which is permanently connected with one group of antennae and is adapted to contact either with the points 1 and 3, in which position the apparatus is in condition for sending a signal, or to be disengaged from these points and to engage the point 2, in which position the secondary of the step-down transformer is connected with the antennae by such means. The generator which is employed for sending the signals may be thus utilized for clearing the antennae of ice.

The apparatus herein illustrated and described is given simply as one form of apparatus which may be employed. It is well known to us that other forms of apparatus

may be employed for securing the same result. We do not, therefore, wish to be understood as limiting ourselves to this particular form of apparatus, but claim any apparatus which is included within the scope of the claims terminating this specification.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a wireless signaling apparatus, the combination with an antenna, a generator of electromotive force of large amperage, and a conductor connected with the upper end of the antenna, of means for including said conductor and the antenna in a closed circuit with said generator.

2. In a wireless signaling apparatus, the combination with an antenna and a conductor connected with the upper end of said antenna, of a generator of electromotive force, a step-down transformer adapted to have its primary connected with said generator, and means for connecting the antenna and the conductor connecting with its upper end in a closed circuit with the secondary of said transformer.

3. In a wireless signaling apparatus, in combination, a plurality of antennæ adapted to be connected to form a complete circuit, and means for passing a heating-current there-through.

4. In a wireless signaling apparatus, in combination, a plurality of antennæ adapted to be connected to form a complete circuit, a step-down transformer and means for connecting the secondary of said transformer in said antennæ-circuit.

5. In a wireless signaling apparatus, in com-

bination, a plurality of antennæ electrically connected at their upper ends, and means for connecting their lower ends with a source of electromotive force adapted to heat the antennæ.

6. In a wireless signaling apparatus, in combination, two elevated supports, an elevated conductor extending between said supports but insulated therefrom, a plurality of antennæ connected with said conductor, and means for connecting the lower ends of said antennæ with opposite poles of a source of electromotive force whereby the said antennæ may be heated.

7. In a wireless signaling apparatus, in combination, two elevated supports, an elevated conductor extending between said supports but insulated therefrom, a plurality of antennæ connected with said conductor, a source of electromotive force, a step-down transformer having its primary in the circuit of said source of electromotive force and means for connecting the secondary of said transformer with the lower ends of different antennæ.

In testimony whereof we have hereunto affixed our signatures each in the presence of two witnesses.

LEE DE FOREST.

WALTER G. CLARK.

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