

H. L. FALK.

AERIAL FOR WIRELESS TELEGRAPH SYSTEMS.

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1,063,671.

Patented June 3, 1913.

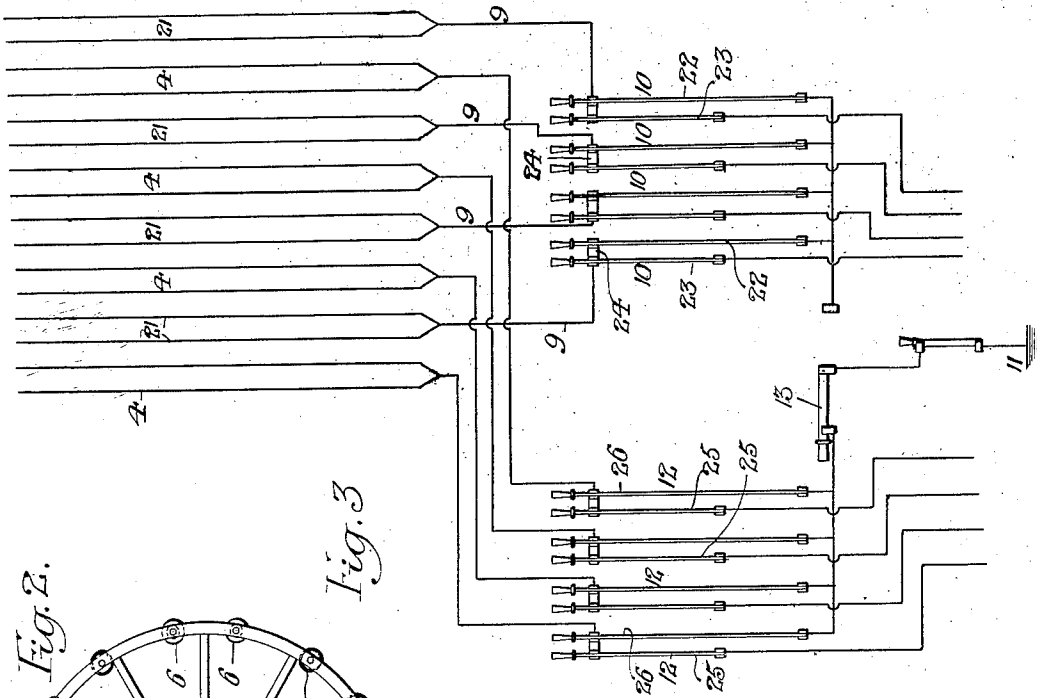


Fig. 2.

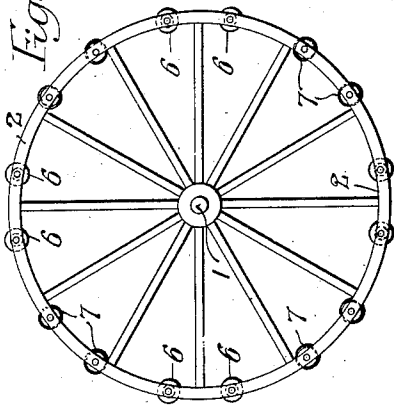


Fig. 3

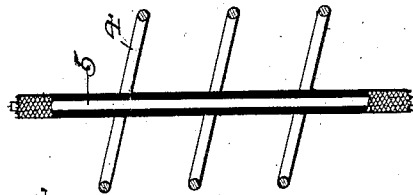
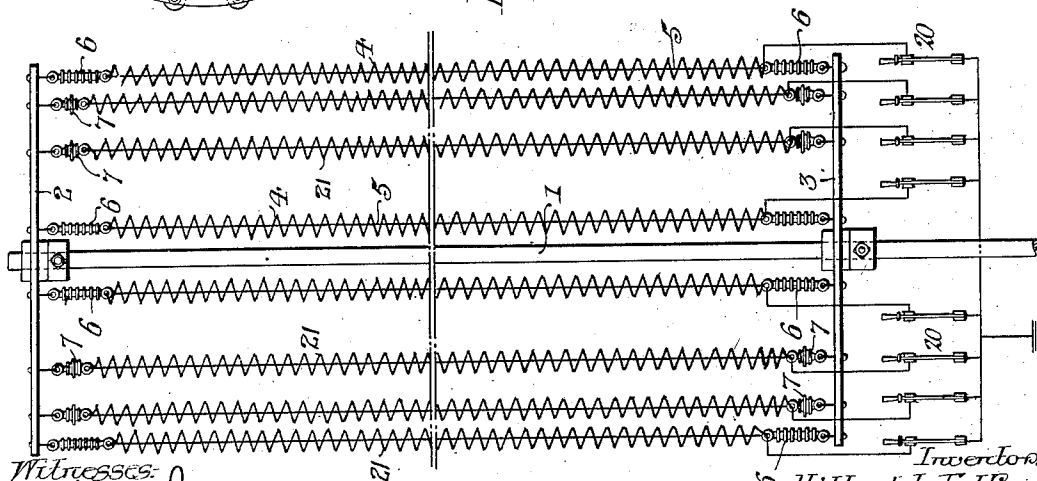


Fig. 4



Witnesses:
Titus H. Irons.
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Fig. 1.

Inventor:
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UNITED STATES PATENT OFFICE.

HILBERT LOUIS FALK, OF NEW ORLEANS, LOUISIANA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO FALK McMAHON WIRELESS TELEGRAPH AND TELEPHONE COMPANY, LMTD. OF LOUISIANA, OF NEW ORLEANS, LOUISIANA, A CORPORATION OF LOUISIANA.

AERIAL FOR WIRELESS-TELEGRAPH SYSTEMS.

1,063,671.

Specification of Letters Patent.

Patented June 3, 1913.

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To all whom it may concern:

Be it known that I, HILBERT L. FALK, a citizen of the United States, and a resident of New Orleans, Orleans parish, Louisiana, have invented certain Improvements in Aerials for Wireless-Telegraph Systems, of which the following is a specification.

One object of my invention is to provide a novel form of aerial which shall have its various parts so arranged as to permit of the efficient reception of the Hertzian or other electro-magnetic waves employed in wireless telegraph and of their transmission to the various instruments employed in detecting their presence; it being especially desired that the device shall be capable of properly performing its functions without transmitting the objectionable effects of static electricity.

Another object of the invention is to provide an aerial by means of which it shall be possible to locate the direction from which a series of electro-magnetic waves are received, and at the same time, when used in connection with a suitable transmitting apparatus, of emitting trains or a series of waves in definite predetermined directions to the exclusion of others.

I further desire to provide an aerial which shall be of simple, substantial, and relatively light construction, in combination with controlling switches whereby I am enabled to conveniently utilize the device.

These objects and other advantageous ends I secure as hereinafter set forth, reference being had to the accompanying drawings, in which:—

Figure 1, is a side elevation of the preferred form of my aerial; Fig. 2, is a plan of the aerial shown in Fig. 1; Fig. 3, is a diagrammatic view illustrating the electrical connections of the various parts of the device, and Fig. 4, is an enlarged vertical section illustrating the detail construction of one of the receiving or transmitting elements of the aerial.

In carrying out my invention, I provide a suitable supporting framework, which, in the present instance, consists of a wooden or other non-conducting pole 1, at the top

of which is attached the hub of a wheel-like structure 2, while a second similar structure 3 is mounted on said pole at a suitable distance below the top thereof in a plane substantially parallel to that of the top element.

Extending between the circular rims of these top and bottom members of the frame are a number of helical coils 4 and 21 of bare wire through each of which an insulated wire 5 extends axially without being in electrical connection with the coil in which it is mounted. All of said inner wires are, however, connected to switches 20 whereby any of them may be grounded. Suitable high potential insulators 6 and 7 are mounted between each end of the various wire coils and the circular rims of the top and bottom members 2 and 3 of the frame, so that each of said coils is electrically insulated from all of the other coils, except that as shown in Figs. 1 and 2, the coils are arranged in pairs the individual members of which are connected.

For convenience of illustration I have shown certain of the coils as provided with long insulators 6 and others as provided with shorter insulators 7 and while the form or size of said insulators is actually immaterial so far as their performance under operative conditions is concerned, it may be noted that the coils 4 having the insulators 6 constitute the sending members of the aerial, being connected to the sending or transmitting apparatus; while the coils 21 having the insulators 7 are connected to the receiving instruments. For this purpose I extend conductors 9 from each pair of the wires 21 to switches 10; there being in this instance four pairs of such receiving wires and hence four of the switches 10. By means of these latter it is possible to connect at will any one of the wires 9 and hence any pair of the wires 21 to the ground indicated at 11 or to one of the four lines leading to the receiving instruments. It is noted that each of the switches 10 includes two blades 22 and 23, of which the first is considerably longer than the other; both blades, however, engaging the

jaws or clips of the contact block 24 connected to one of the aerial wires. The blade 23 is pivoted to a suitable supporting structure of insulating material considerably below the corresponding pivotal support and terminal of the blade 22 so that when it is in its open position all grounded parts of the switch are at a considerable distance from the said blade 22 and its associated parts. The pairs of wires indicated at 4 are similarly brought down to a set of switches indicated at 12 being connected to double jaw terminals of said switches, which like the switches 10, are provided with short blades 25 respectively connected to the transmitting instruments, and long blades 26. A double throw switch 13 may be provided whereby either of the sets of switch blades 22 or 26 may be connected to the ground at will.

Under operating conditions it is possible, and usually advisable, to ground any or all of the wires of the aerial except that particular pair or pairs which it is desired shall be employed to receive a message and it is to be noted that by so grounding said wires the wires in use are in effect shielded on all sides except for a certain segmental space in front of and extending outwardly from the aerial. By this means it is possible to reduce the effect of a relatively near or powerful station from interfering with or preventing the reception of messages by the apparatus connected to my improved aerial, since by grounding the various wires 4 and 21, except those on the side of the aerial from which the message is to be received, I avoid to a great extent the disturbance which would otherwise be caused. Similarly, by means of the arrangement of parts shown I am enabled to direct the trains of electro-magnetic waves by causing them to be emitted in a certain limited and definite direction to the exclusion of all other points of the compass, and for this purpose I ground all of those wires on that side of the aerial opposite that nearest the receiving station.

It is, of course, obvious that more than two wires may be employed in each of the sets connected to the various transmitting and receiving wires. However, by the system described the objectionable effects of static electricity are almost entirely avoided and by the arrangement of the switches shown, any danger of the current jumping from one part of the apparatus to another part which is grounded is likewise prevented.

In the event of there being heavy static discharges from the atmosphere as during electrical storms. I may ground any desired number of the elements of aerial while employing one or more of the other elements in connection with the instruments for re-

ceiving messages. I have found that by this means the objectionable effects of static electricity are reduced to a minimum.

The various interior wires 5 are particularly useful in leading to ground static discharges and especially in protecting the aerial and the instruments from lightning. If desired, said wires may be permanently grounded, although as there may be times when it is desirable for them to be insulated from the ground, I have provided the switches 20.

I claim:

1. An aerial for wireless telegraph and telephone systems consisting of a frame; elements for receiving or transmitting mounted on said frame and consisting of open coils of wire each having within it a substantially straight length of wire; means for grounding said straight lengths of wire; and means for connecting the wire coils to receiving or transmitting instruments.

2. An aerial for wireless telegraph and telephone systems consisting of a frame; a receiving or transmitting element mounted on the frame and consisting of an open coil of wire having within it a substantially straight length of wire; the wire of said coil being bare and that of the straight length being insulated, means for grounding said straight length of wire at will; and means for connecting the wire coil to receiving or transmitting instruments.

3. An aerial for wireless telegraph and telephone systems consisting of a frame; a plurality of receiving and transmitting members thereon; each member consisting of an open coil of wire having a straight length of wire extending axially within it; and means for connecting said interior wires with the ground.

4. An aerial for wireless telegraph and telephone systems consisting of a supporting frame including upper and lower supporting members; a plurality of pairs of receiving elements extending between said supporting members; a plurality of pairs of transmitting elements also extending between the supporting members and alternating with the receiving elements; and means for connecting said elements to receiving and transmitting instruments.

5. The combination of an aerial for wireless telegraph or telephone systems consisting of a plurality of receiving and transmitting elements; with means for connecting said elements respectively to receiving and transmitting instruments, said means including two sets of switches, the switches of one set each including a contact connected to the receiving elements and two blades of unequal length capable of engaging said contact; means for connecting the shorter of said blades to a receiving instrument; means for grounding the longer blade; the switches

of the other set each having a contact connected to the transmitting elements and two blades of unequal length, both capable of engaging said contact, the shorter of the blades being electrically connected to a transmitting instrument and the longer blade being grounded.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

HILBERT LOUIS FALK.

Witnesses:

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WM. A. BARR.
