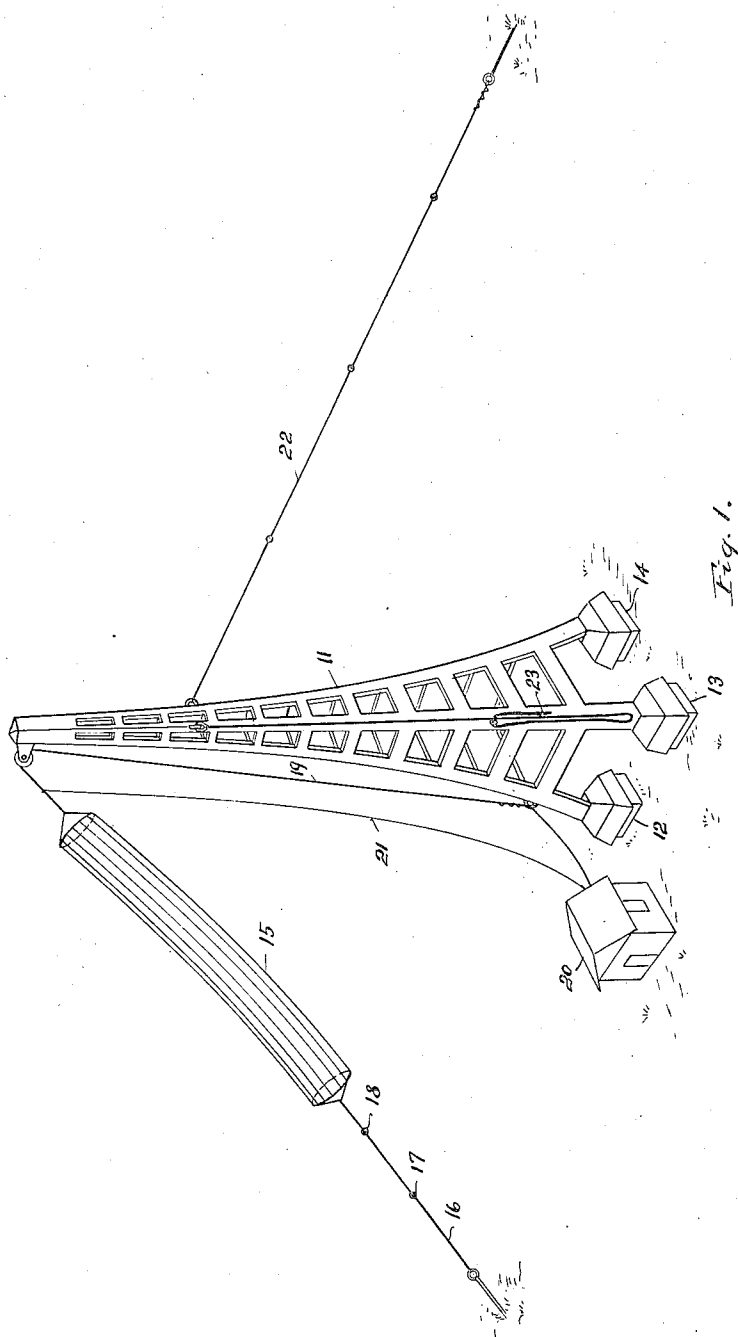


R. A. FESSENDEN.  
SIGNALING BY ELECTROMAGNETIC WAVES.  
APPLICATION FILED FEB. 8, 1907.

1,002,051.

Patented Aug. 29, 1911.

2 SHEETS-SHEET 1.



Witnesses  
F. V. Krausbein  
Jessie E. Bent

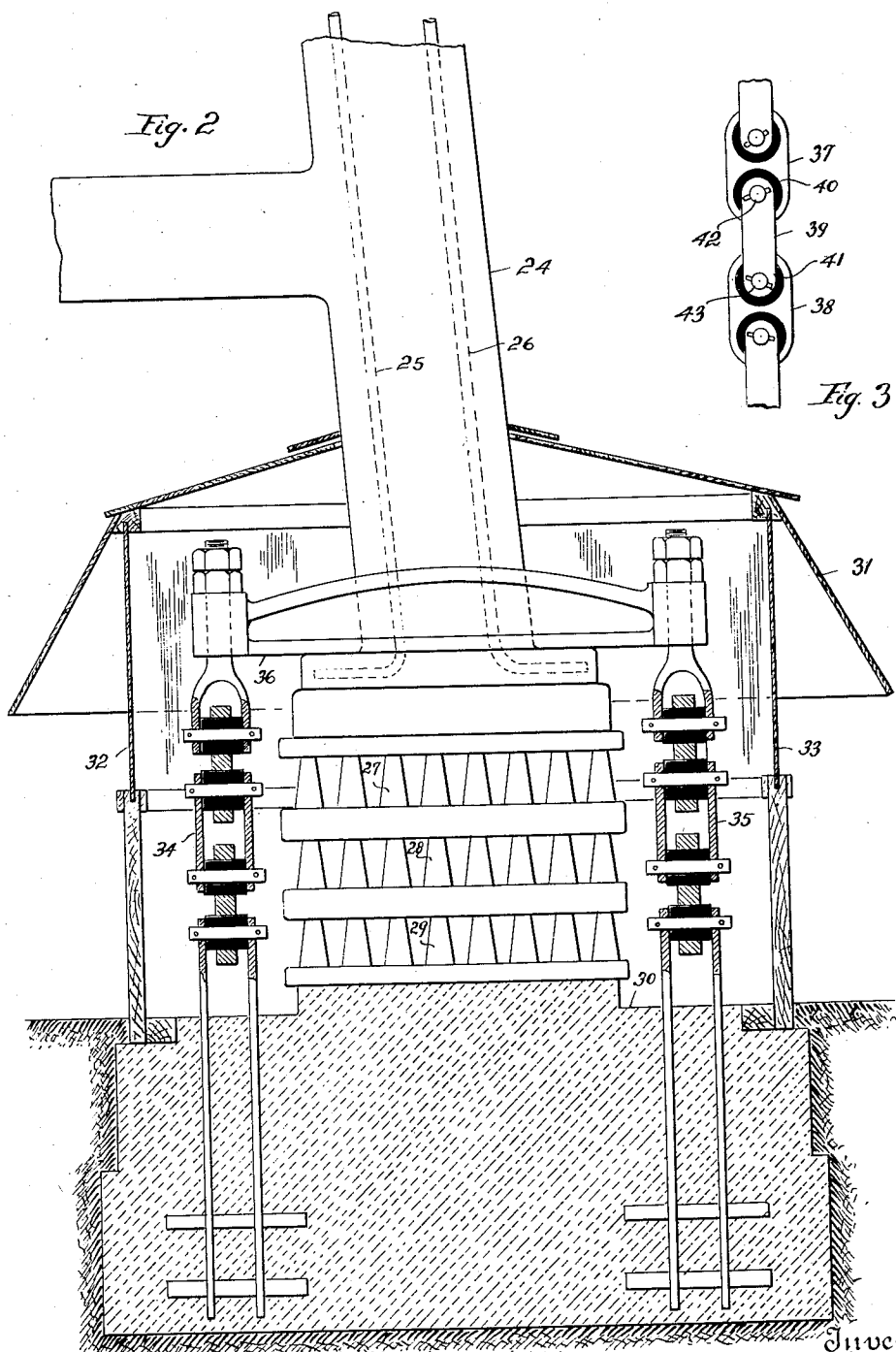
Inventor  
Reginald Farmer

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2 SHEETS—SHEET 2.



Witnesses  
 F. V. Hausknecht  
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# UNITED STATES PATENT OFFICE.

REGINALD A. FESSENDEN, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR TO  
NATIONAL ELECTRIC SIGNALING COMPANY, OF PITTSBURG, PENNSYLVANIA, A  
CORPORATION OF NEW JERSEY.

SIGNALING BY ELECTROMAGNETIC WAVES.

1,002,051.

Specification of Letters Patent.

Patented Aug. 29, 1911.

Application filed February 8, 1907. Serial No. 356,384.

*To all whom it may concern:*

Be it known that I, REGINALD A. FESSENDEN, a citizen of the United States, and a resident of Washington, in the District of Columbia, have invented certain new and useful Improvements in Signaling by Electromagnetic Waves, of which the following is a specification.

My invention relates to antennæ for wireless signaling and its primary object is to construct an efficient and reliable antenna for working over long distances.

In the accompanying drawings forming a part of this specification Figure 1 is a perspective view of a construction for carrying out my invention and Figs. 2 and 3 show details of construction.

I have discovered a novel form of construction which overcomes the difficulties heretofore met with in using antennæ, such as absorption of waves by antenna supports and enables antennæ to be used of practically any capacity and desirable height, and at a low cost of maintenance and with perfect safety and of high efficiency. With this form of construction I am enabled to use ferro-concrete towers without the waves being absorbed or shielded and at the same time without danger of the structure being blown down by wind storms.

In Fig. 1, 11 is a ferro-concrete tower, having its supports arranged so that any electrical oscillations which may be generated in the structure of the tower are not conducted to earth. This is preferably accomplished by discontinuing the metallic portion of the ferro-concrete structure some distance above the foundations, and insulating the lower ends of the tower by any suitable means preferably by the insulating structures 12, 13, 14 shown in detail in Fig. 2. One or more wire cylinders 15, or their equivalent may be used for giving a large capacity to the aerial, the cylinders being supported at their outer ends by the anchored guy ropes 16, insulated by the strain insulators 17, 18. The cable 19 for hoisting the cylinder 15 is preferably formed of conducting material, as wire rope, and brought along the side of the ferro-concrete tower as shown, and thence into the operating house 20 for the purpose of absorbing electro-magnetic waves received and thus

shielding the ferro-concrete structure from the waves which would otherwise be uselessly absorbed by it. A conductor such as 21 may be run directly from the end of the cylinder 15 into the operating house in the usual way. 22 is a temporary guy. It is normally suspended from the side of the tower as shown at 23 to be used as shown at 22 only as a temporary provision in the case of anticipated hurricanes of abnormal severity.

Fig. 2 shows a convenient means for insulating the bottom of the ferro-concrete structure. 24 shows the ferro-concrete structure, 25 and 26 being iron and steel rods embedded in the cement. 27, 28, 29 are three stacks of porcelain insulators supporting the foot of the tower. 30 is the foundation. 31 is a weather shield. 32 and 33 are pieces of plate glass for preventing the rain from entering. In order to avoid an impracticable extension of the base, or the use of guys, necessitated by the break in the continuity of the ferro-concrete structure I introduce strain insulators 34, 35 joining the yoke 36 to the foundation 30, thereby enabling the supports of the towers to withstand tensile stresses as well as compression stresses, and permitting the use of a tower having a comparatively narrow base and avoiding the use of guys under normal working conditions. Fig. 3 shows a detail of these strain insulators, where 37, 38 are yokes, 40, 41 are porcelain insulators, 42, 43 are pins and 39 are straps joining the pins. The porcelain insulators are cemented in with any suitable material such as sulfur.

In operation, the tower stands without guys, the guys 22 being only for the purpose of being used when violent hurricanes are anticipated. The tower is preferably coated with a coating of silicate or water proof paint to prevent absorption of moisture and the usual means are provided, such as ladders, inclosed or open, for gaining access to the upper parts of the tower. The arrangement herein described possesses many advantages over other types in that it is not necessary to support it by guys, it gives antennæ of very large capacity and high efficiency, it is easily kept up and requires but little repair and by the method herein disclosed for enabling ferro-concrete structures to be used for such purposes, I am able to

obtain all the advantages consequent to its use as regards ease of construction, etc.

Having thus described my invention and illustrated its use, I claim and desire to secure by Letters Patent, the following:

1. The combination of an insulated ferro-concrete antenna support and an antenna arranged to prevent said support from absorbing electro magnetic waves received.
2. A partly metallic insulated antenna support, and an antenna arranged so that parts of it shield the support from the electro-magnetic waves received.
3. An antenna having a support built of ferro-concrete, insulated at the base and adapted to be used as part of the antenna, while the other part of the antenna is arranged to shield it from electro-magnetic waves received when desired.
4. An antenna comprising wire conductors

and a ferro-concrete support therefore insulated at the base and shielded by said wires.

5. A support for an antenna comprising a self-supporting metal frame covered with concrete, being insulated from the earth at the base and attached to the earth by anchorages adapted to resist both compression and tension strains, substantially as described.

6. An antenna support built of ferro-concrete having a flared base insulated from the ground and having tensile members anchoring the base, and also insulated from the support and ground.

Signed at Brant Rock in the county of Plymouth and State of Massachusetts this 6th day of February, A. D. 1907.

REGINALD A. FESSENDEN.

Witnesses:

JESSIE E. BENT,

ADELEINE W. LEWIS.