

No. 717,511.

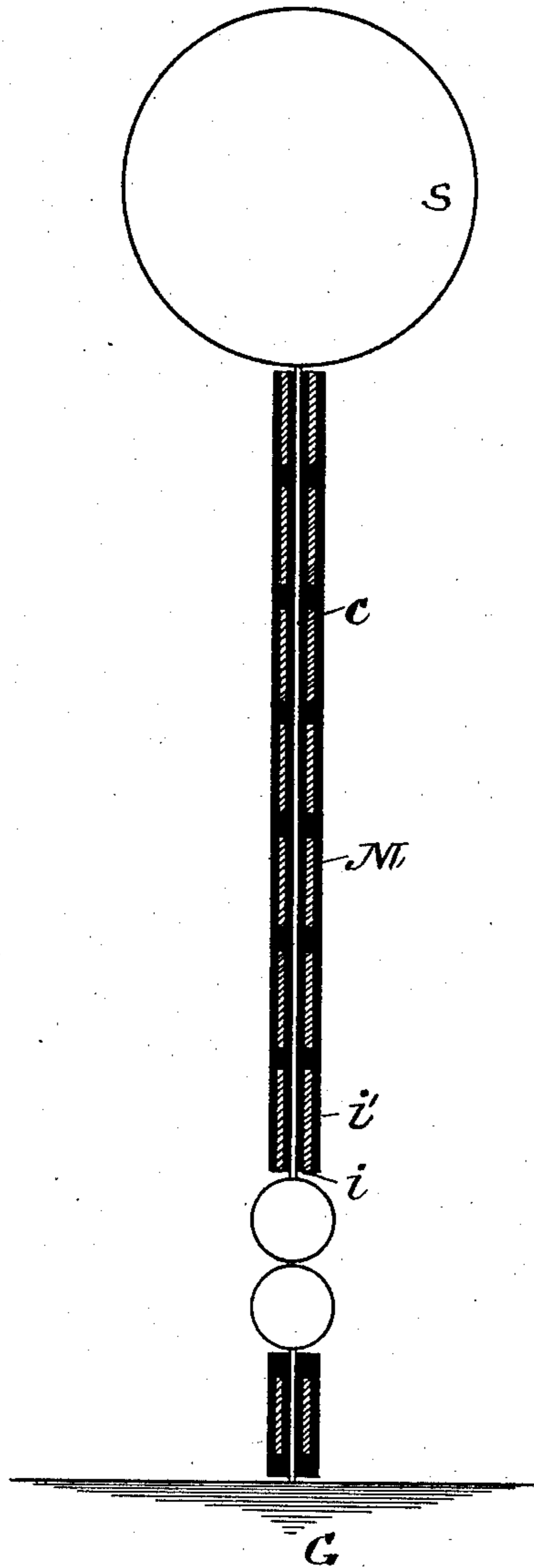
Patented Dec. 30, 1902.

J. S. STONE.

METHOD OF TUNING VERTICAL WIRE OSCILLATORS.

(Application filed Jan. 23, 1901.)

(No Model.)



WITNESSES:

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# UNITED STATES PATENT OFFICE.

JOHN STONE STONE, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO LOUIS E. WHICHER, ALEXANDER P. BROWNE, AND BRAINERD T. JUDKINS, TRUSTEES.

## METHOD OF TUNING VERTICAL WIRE OSCILLATORS.

SPECIFICATION forming part of Letters Patent No. 717,511, dated December 30, 1902.

Application filed January 23, 1901. Serial No. 44,390. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN STONE STONE, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Methods of Tuning Vertical Wire Oscillators, of which the following is a specification.

The invention relates to the art of space telegraphy or of signaling electrically between stations not connected by a conducting-wire, and more particularly to the elevated-conductor system of space telegraphy or that system in which the signals are transmitted by means of the electromagnetic waves which emanate from elevated conductors.

The object of the present invention is to provide in an elevated-conductor system of space telegraphy means for definitely tuning the elevated conductors, both at the transmitting and receiving stations, to any desired periodicity, and this is accomplished by distributing the electromagnetic inertia along the wire and balancing said electromagnetic inertia by a suitable capacity. This I do by surrounding the conductor with a sheath formed of a medium of greater permeability than the air, but not conductively connected with the conductor, and by balancing the increased inductance thereby obtained by a suitable capacity. A means of accomplishing this end is illustrated in the figure, in which—

C is a central copper core.

*i* is a layer of suitable insulation.

M is a circumferentially continuous but longitudinally discontinuous paramagnetic sheath.

*i'* is another layer of insulation.

S is a conducting-sphere, and G is a ground connection.

The free period of such a system will be approximately determined by the formula

$$T = 2 \pi \sqrt{CL},$$

where C is the electrostatic capacity of the sphere S, measured to earth, and L is the inductance of the conductor connecting S with the earth. The distributed electromagnetic inertia may also be conveniently imparted to the wire C by first insulating it and then winding on a layer of iron wire after the manner in which pianoforte-strings are loaded; but in every case care must be taken to produce longitudinal electrical discontinuity in the iron sheathing or wrapping at frequent intervals. Again, an insulating-coat thoroughly impregnated with iron-dust may be used, and, in fact, there are a great variety of ways of realizing the desired result; but

What I claim as my invention is—

The method of tuning a vertical wire oscillator which consists in increasing its natural inductance or natural electromagnetic inertia by surrounding the conductor with a sheath formed of a medium of greater permeability than the air, but not conductively connected with the conductor, and balancing the increased inductance thereby obtained by a suitable capacity.

JOHN STONE STONE.

In presence of—

ALEX. P. BROWNE,  
ELLEN B. TOMLINSON.