No. 737,703. PATENTED SEPT. 1, 1903.

G. A. CAMPBELL.

SELF INDUCTION COIL.

APPLICATION FILED FEB. 8, 1902.

NO MODEL.

Fig. 1.

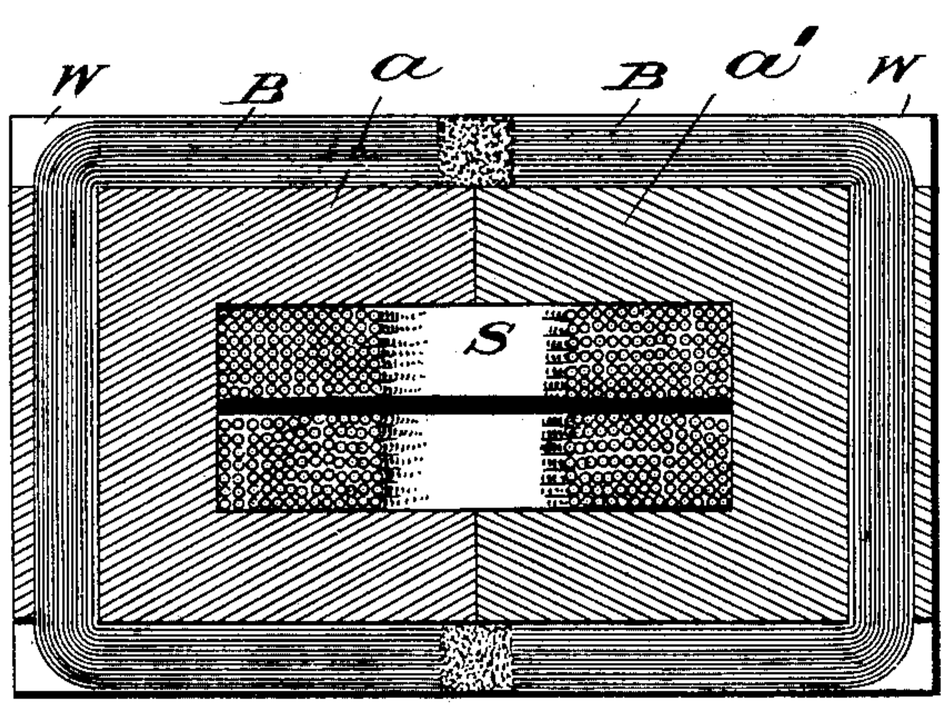
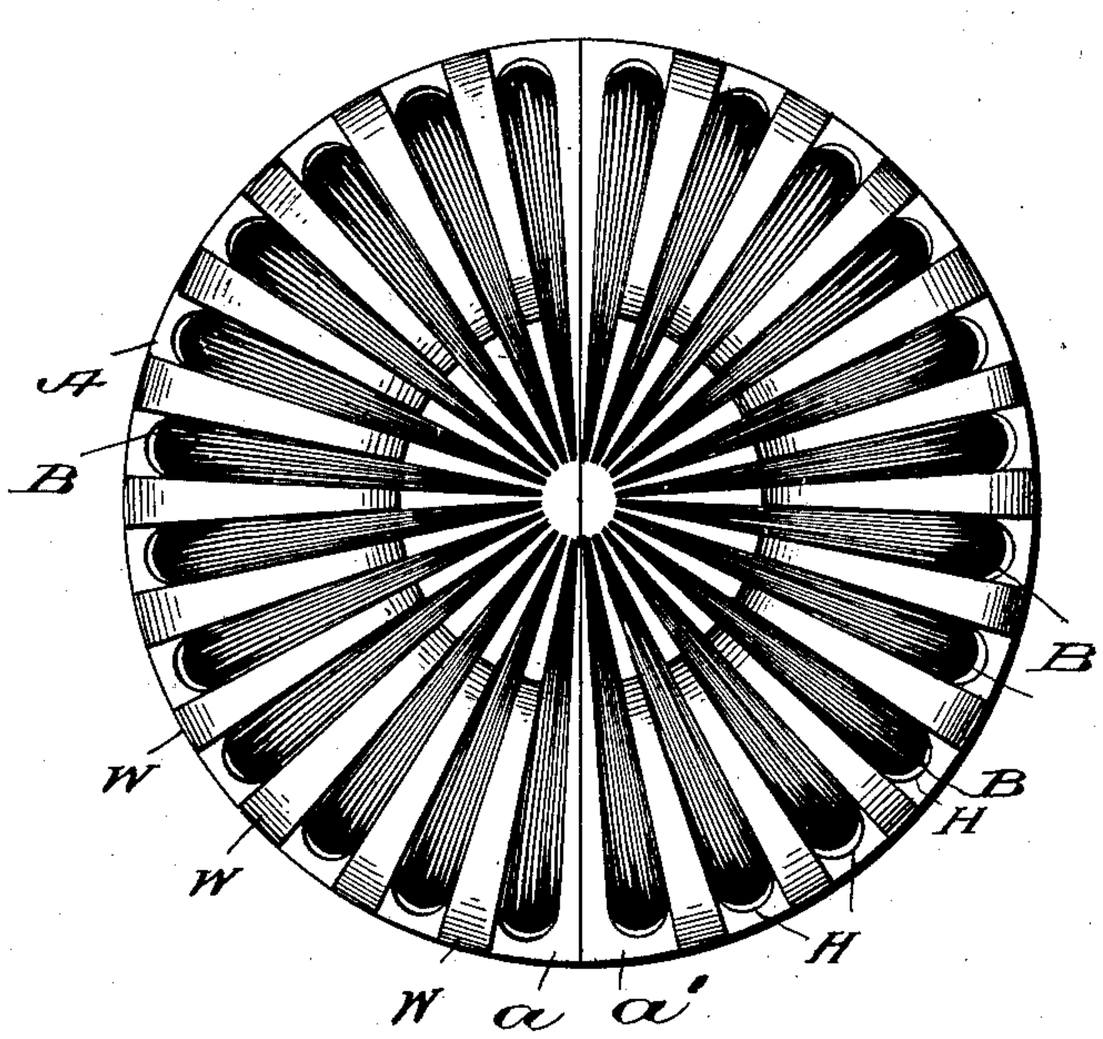


Fig. 2.



Witnesses

Inventor

George A. Campbell

By Philip A. Mauro

Attorney

No. 737,703. Patented September 1, 1903.

UNITED STATES PATENT OFFICE.

GEORGE A. CAMPBELL, OF NEWTON, MASSACHUSETTS, ASSIGNOR TO AMERICAN TELEPHONE AND TELEGRAPH COMPANY, A CORPORATION OF NEW YORK.

SELF-INDUCTION COIL.

SPECIFICATION forming part of Letters Patent No. 737,703, dated September 1, 1903.

Application filed February 8, 1902. Serial No. 93,239. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. CAMPBELL, residing at Newton, in the county of Middlesex and State of Massachusetts, have invented certain Improvements in Self-Induction Coils, of which the following is a specification.

The invention relates to self-induction coils, such as are employed in loading electric circuits, and more particularly to self-induction coils in which use is made of iron in the magnetic field, the iron being disposed wholly or for the most part outside of the electric winding—*i. e.*, outside the winding of the self-induction coil proper in the less-intense portion of the magnetic field—while the magnetic circuit is completed by air or a substitute for air in the more-intense portion of the magnetic field. The iron wires upon the outside of the coil serve as a shield to prevent inductive action between this circuit and any other circuits, coils, apparatus, or masses of metal. A self-induction coil of such general character is described in my application for a patent, filed June 5, 1900, Serial No. 19,184, where the iron in the magnetic field consists of iron wires, such division of the iron greatly reducing dissipative iron losses in the manner well known in kindred electrical devices.

I find that the iron wires may be grouped in bundles without material reduction in their shielding efficiency. By this grouping of the wires into bundles also the path or circuit for the Foucault or dissipative currents around the circumference of the shield is completely interrupted. Moreover, by such grouping of the wires a convenient method of construction is afforded, since the wires may readily be bound together in long ropes and then cut into convenient lengths, which may be bent to embrace the sides and ends of the electric coil or the self-induction coil proper.

In actual use self-induction coils on loaded lines will be associated in pairs, each pair being wound upon a single spool, actual or imaginary, and inclosed in a single iron box, one pair of the coils being connected up in one wire of a metallic circuit and the other coils being connected up in the other wire of the same circuit. The two coils may have the same magnetic path, including the iron.

In the drawings, accordingly, I show two self-induction coils; but so far as this invention is concerned it is immaterial whether the pair be regarded as a pair or as a single coil.

Figure 1 is a self-induction coil embracing my present invention in middle cross-section from end to end. Fig. 2 is an end view of said coil.

The two ends are alike. S is the self-induction coil proper, consisting of a winding of copper wire or similar electrical conductor, closely fitting within a circular box A, of wood or similar insulating material, in two parts *a a'*.

H H H are holes bored through the wooden box A from end to end near the periphery of the box.

W W W, &c., are wedge-shaped cleats of wood or similar insulating material fastened to the ends of the box A and converging toward its center, as shown.

B B B, &c., are bundles of iron wires, each bundle passing through a separate hole H and having its ends bent at the respective ends of the box A between two cleats W W and there fastened in any convenient manner.

As shown, the cleats W W, &c., do not extend to the center of the box at the ends, and in practice it is not essential to the invention that the bundles of iron shall be separated to the very center of the box. Further separation than shown may be had by inserting cardboard beyond the inner ends of the cleats. Such further separation is preferable unless the ends of the wires have become oxidized.

In constructive practice each half *a a'* of the box A will be equipped with its bundles of iron wire separately from the other half, the copper winding then placed within one-half and the two halves put together.

The holes H H are of advantage in preserving the identity of the separate bundles of iron wire; but it is obvious that they might be bent over the outside of the box and held in their U shape between the wedges W to embrace the sides and ends of the coil without loss of their magnetic or electromagnetic effect.

I claim—

A self-induction coil consisting of an electric winding with iron and an air-space or

similar gap in its magnetic field, the said iron being disposed outside of the electric winding in U-shaped wire bundles apart from one another, while the air or similar gap completes the magnetic circuit within and at the middle of the electric winding, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 4th day of February, 1902.

GEORGE A. CAMPBELL.

Witnesses:
GEO. WILLIS PIERCE,
FRANK C. LOCKWOOD.