

(No Model.)

A. F. BOARDMAN.
MAGNETO APPARATUS.

No. 510,320.

Patented Dec. 5, 1893.

FIG. 1.

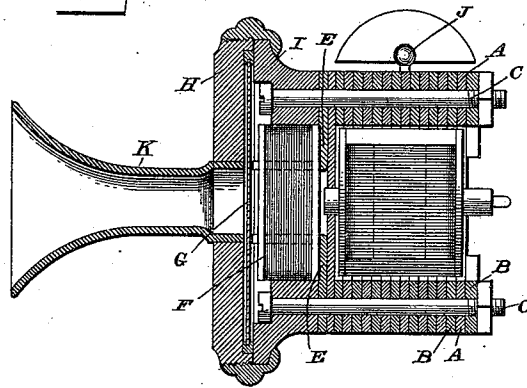


FIG. 2.

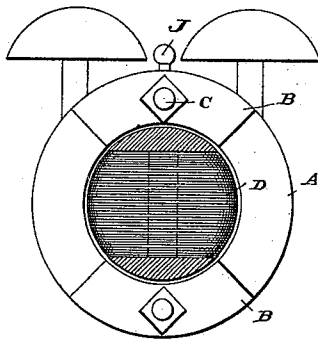


FIG. 3.

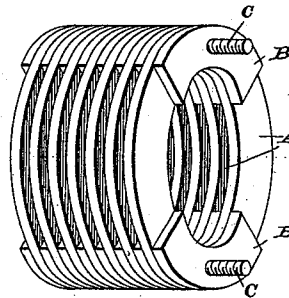


FIG. 5^b.

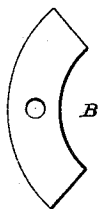


FIG. 5^a.

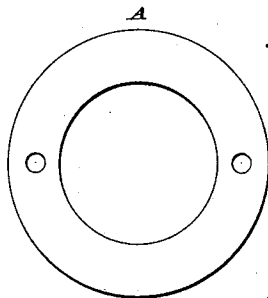


FIG. 4.

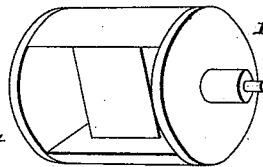
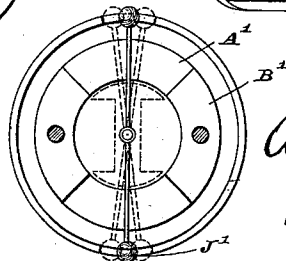


FIG. 6.



Witnesses
Edw. S. Duwall, Jr.
Wm. L. Boyden

Inventor
Arthur F. Boardman
per Fred W. Vasker,
Attorney.

UNITED STATES PATENT OFFICE.

ARTHUR F. BOARDMAN, OF SOMERVILLE, ASSIGNOR OF ONE-HALF TO JOHN TYLER HICKS, OF BOSTON, MASSACHUSETTS.

MAGNETO APPARATUS.

SPECIFICATION forming part of Letters Patent No. 510,320, dated December 5, 1893.

Application filed September 20, 1893. Serial No. 486,028. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR F. BOARDMAN, a citizen of the United States, residing at Somerville, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Magneto Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention has reference to an improvement in electro magnetic apparatus, the object being to provide an improved field construction for use with magneto-bells, generators, galvanometers and other similar magneto apparatus, where permanent magnets are employed; and the invention therefore consists in the construction, arrangement and combination of parts, substantially as will be hereinafter described and then more particularly pointed out in the ensuing claims.

In the annexed drawings illustrating my invention: Figure 1 is a longitudinal sectional view of a telephone constructed and equipped with my present electro magnetic improvements. Fig. 2 is a transverse section of the same. Fig. 3 is a perspective view of a compound field magnet which I employ. Fig. 4 is a perspective view of an armature. Figs. 5^a and 5^b represent in detail, the permanently magnetized steel rings and the soft iron sectors which are placed together alternately in a series to make up the magnet. Fig. 6 represents the construction of a double stroke polarized bell.

Similar letters of reference designate corresponding parts throughout all the different figures of the drawings.

In carrying my improvements into practice, I construct a compound field magnet, consisting of annular rings or plates A of thin sheet metal, such as steel, which are hardened and permanently magnetized; also I provide sectors B of soft sheet iron. These permanently magnetized rings A and soft iron sectors B are placed in a series alternately with each other, as shown in Fig. 3, there being two sectors B located between each two adjacent rings A, the sectors being situated diametrically op-

posite to each other and forming polar extensions. After these rings have thus been placed in alternation, they are clamped by means of the longitudinal bolts C, provided on one end with a head and on the other end with an adjustable nut whereby the clamping is effected. In this manner a compound field magnet like that shown in Fig. 3, is constructed, having a north and south polarity and extending the entire length of the combination on the inner edges of the polar extensions. By this method of construction a very compact and intense magnetic field is formed, within which a Siemens or other armature may be rotated.

D represents the armature. It is shown in detail in Fig. 4. This is only one example of armature. Other rotative kinds may be employed. The armature is suitably supported within the magnetic field and rotated in any desired manner.

It will be obvious that the rings A may vary in diameter when the magnet is constructed for different purposes. I reserve the liberty therefore of making the field magnet of any size and with any number of plates, it being only necessary in order that it may carry my idea into effect, that it should be made up of numerous permanently magnetized thin sheet metal rings, between which soft iron sectors are placed, there being two of them between each two of the rings and placed diametrically opposite to each other.

My improved electro magnetic construction is primarily intended for use in making a simple, cheap and efficient telephone, which will be especially valuable for use on short lines, such as for establishing communication between different parts of the same building or between buildings which are near to each other. Although the invention is especially adapted for this telephonic use, yet it will be found very valuable for use with magneto bells, generators, galvanometers, and other small magneto apparatus when permanent magnets are used.

The compound field magnet which I have just described has a multitude of advantages. It is very compact because by the use of thin laminæ of steel, compounded as stated, a

powerful magnetic field is obtained with very great lightness of material and a very simple, firm and compact construction. Secondly, the construction is very cheap, since by using the thin steel rings, the use of forged or cumbersome cast iron permanent magnets, is obviated and smaller and fully as effective instruments can be manufactured. A third advantage consists in the wide variety of applications and uses to which this field magnet can be put.

In Figs. 1 and 2, I have represented a telephonic construction, including the compound field magnet and its armature, which are illustrated so fully in Figs. 3, 4 and 5. K represents the mouth-piece and H and I, portions of the casing, the mouth-piece K being attached to the casing H, while the compound field magnet, consisting of the alternate parts A and B, is clamped by means of the bolts C, to the casing I. The armature D is located inside of the field magnet in the customary manner. G designates a soft iron diaphragm which is clamped between the cases H and I across the mouth-piece opening, so as to be in the customary and proper position to be excited by the vibrations of air within the mouth-piece. On the end of the magnet nearest to the diaphragm G are clamped the angle pieces E, of soft iron, whose extremities are in close proximity to the diaphragm G. These angle pieces E support the telephone bobbins F which are wound with fine wire in the ordinary manner. On the casing of the telephone is arranged one or more electromagnetic bells, and the armature D carries a hammer J which acts upon the bell at the proper time. Thus it will be seen that this arrangement of parts, comprising a very simple and effective combination of the magneto telephone and the polarized bell, has many

valuable functions and is susceptible of a wide variety of uses.

In Fig. 6, J' denotes a double hammer, A' a steel ring, and B' a soft iron sector. The vibrating double armature is polarized and the hammer acts on a single gong supported on the end of the field magnet.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The herein described field magnet, consisting of a series of permanently-magnetized rings, and soft metal sectors located alternately between them, substantially as described.

2. A field magnet, consisting of a series of permanently-magnetized thin metallic laminae, and a pair of soft metallic sectors placed alternately between them to form polar extensions, substantially as described.

3. A field magnet, consisting of a series of permanently-magnetized thin metallic laminae, and sectors of soft metal placed alternately between them to form polar extensions, in combination with an armature arranged to be rotated within the intense magnetic field formed by the said magnet.

4. In a telephone, the combination of a compound field magnet, consisting of permanently-magnetized rings of sheet metal, and alternate soft metal sectors, a polarized bell, an armature within the magnet, the vibrating diaphragm and the telephone bobbin, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

ARTHUR F. BOARDMAN.

Witnesses:

MARY E. WOODBURN,
JOHN L. S. ROBERTS.