(No Model.) 4 Sheets—Sheet 1.

H. H. TAYLOR.

MAGNETO ELECTRIC MACHINE.

No. 513,347. Patented Jan. 23, 1894.

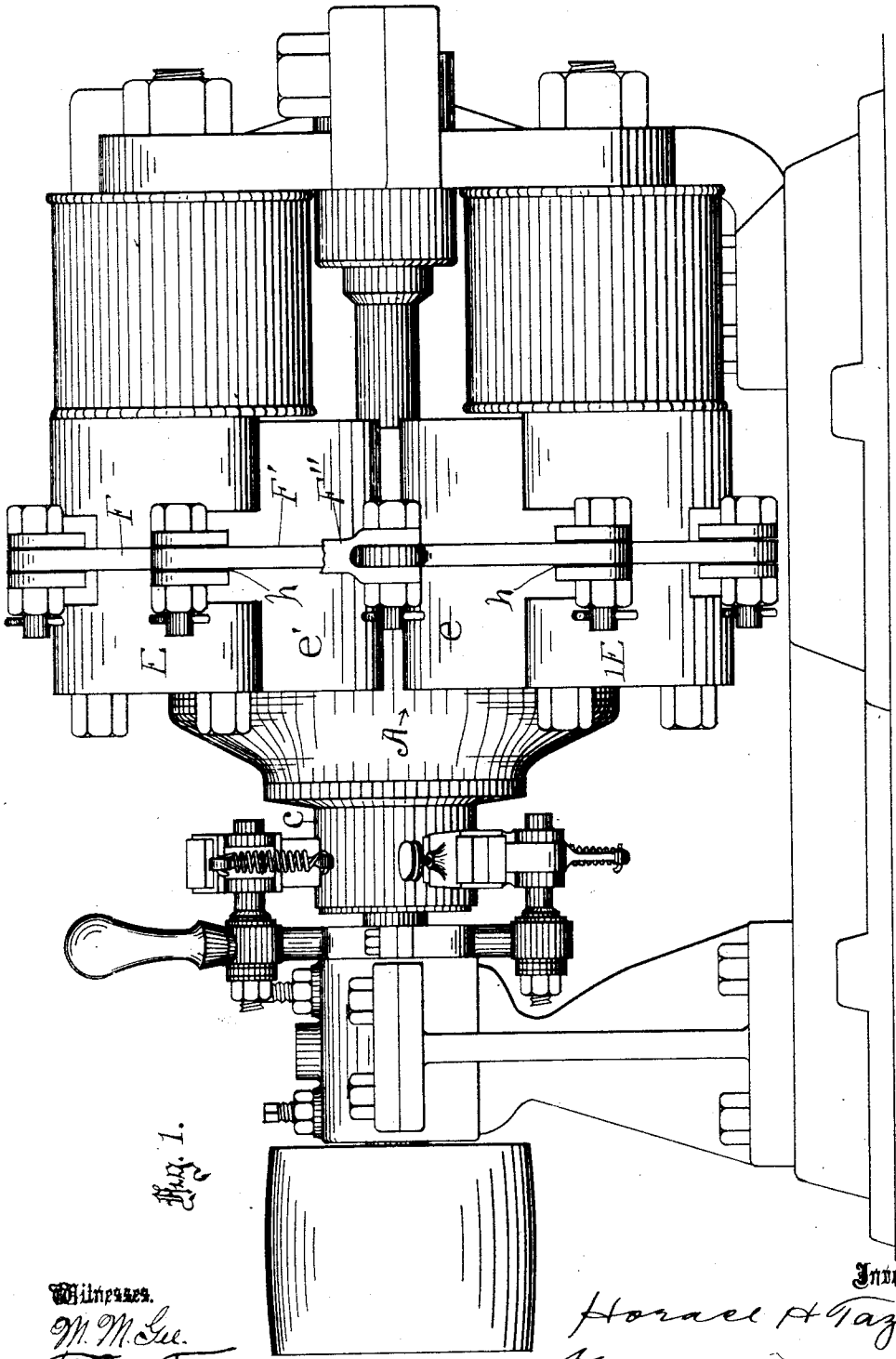


Fig. 1.

Witnesses.
M. M. Lee.
F. M. Townsend

Inventor.
Horace H. Taylor
by
Hazard & Townsend
his attys

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

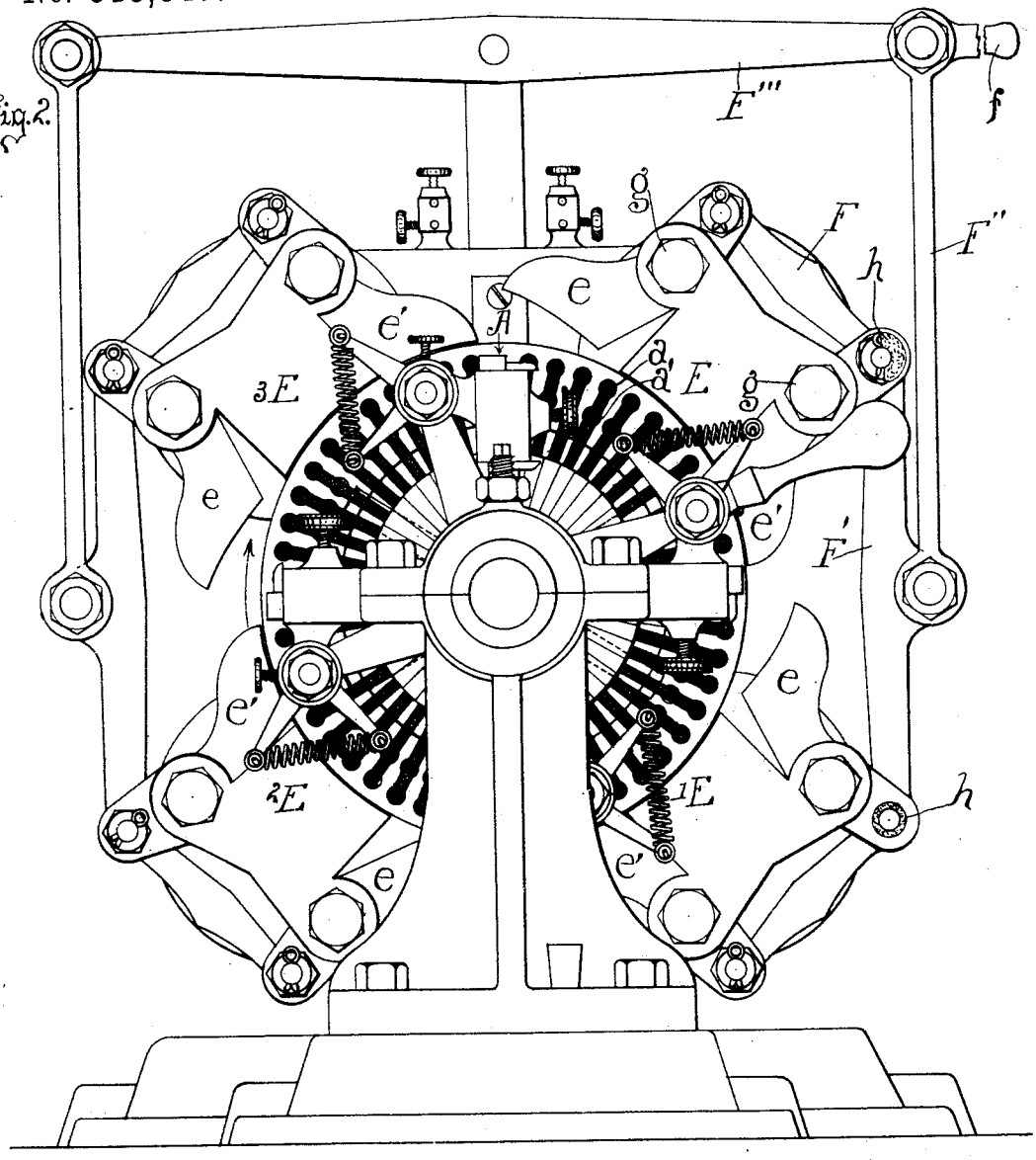
(No Model.) 4 Sheets—Sheet 2.

H. H. TAYLOR.

MAGNETO ELECTRIC MACHINE.

No. 513,347. Patented Jan. 23, 1894.

Fig. 2.



Witnesses.
M. M. Lee.
F. M. Townsend

Inventor.
Horace H. Taylor
by Hazard & Townsend
his attys.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.)

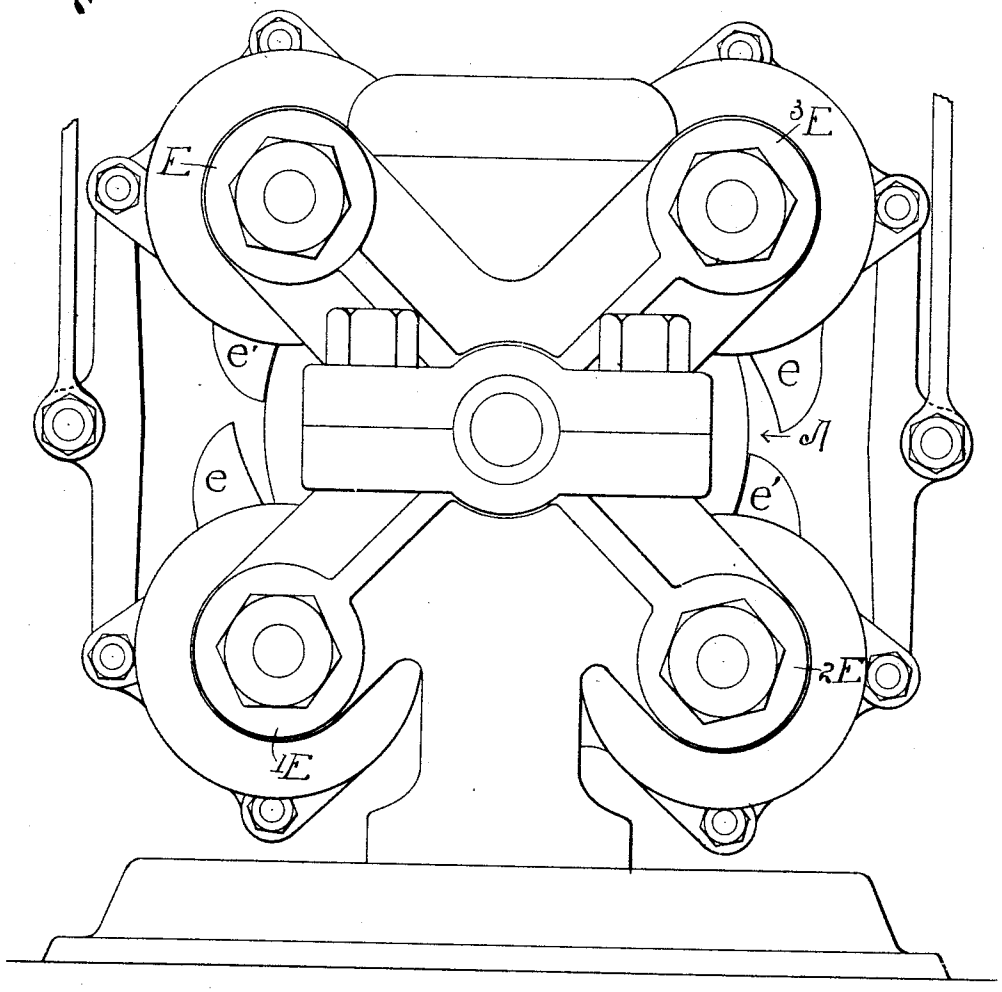
4 Sheets—Sheet 3.

H. H. TAYLOR.

MAGNETO ELECTRIC MACHINE.

No. 513,347. Patented Jan. 23, 1894.

Fig. 3.



Witnesses
M. M. Lee.
F. H. Townsend.

Inventor.
Horace H. Taylor
by
Hazard & Townsend
his attys

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.) 4 Sheets—Sheet 4.

H. H. TAYLOR.

MAGNETO ELECTRIC MACHINE.

No. 513,347. Patented Jan. 23, 1894.

Fig. 4.

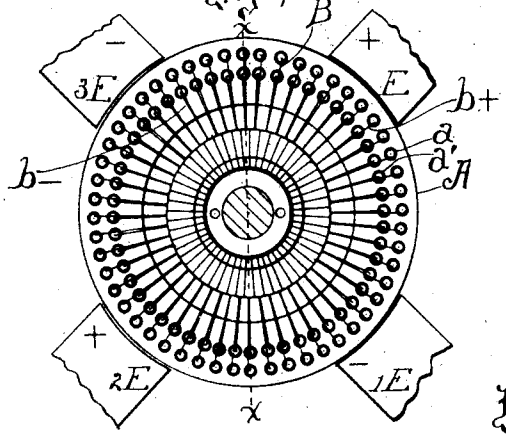


Fig. 5.

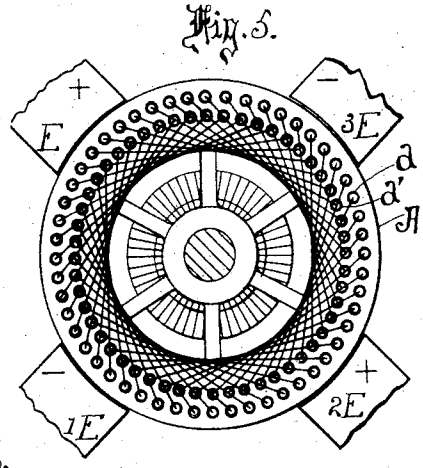


Fig. 6.

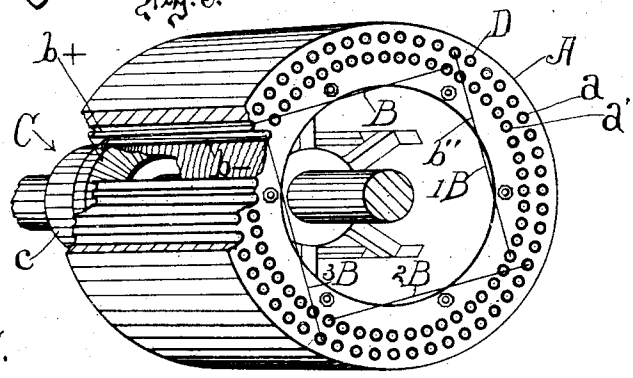


Fig. 7.

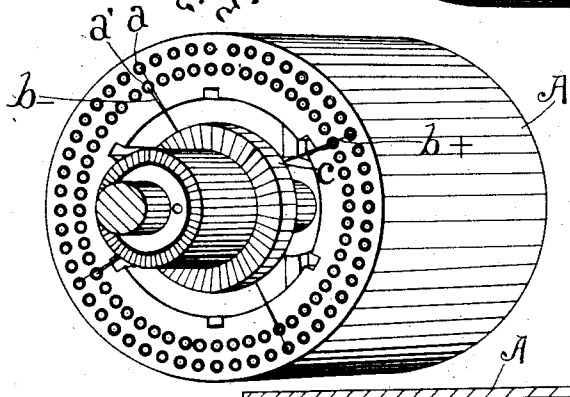


Fig. 9.

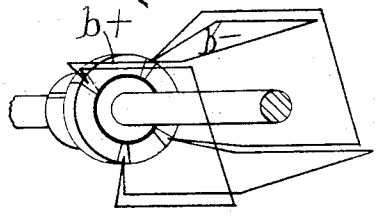
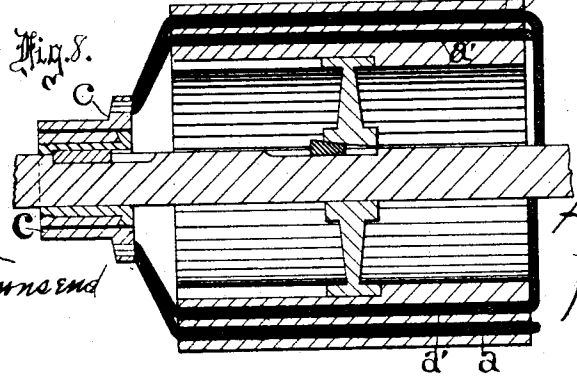


Fig. 8.



Witnesses.
W. W. Lee.
F. M. Townsend

Inventor.
Horace H. Taylor
by
Hazard & Townsend
his attys.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HORACE H. TAYLOR, OF LOS ANGELES, CALIFORNIA, ASSIGNOR OF ONE-HALF TO GEORGE W. MITCHELL, OF SAME PLACE.

MAGNETO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 513,347, dated January 23, 1894.

Application filed March 15, 1893. Serial No. 466,008. (No model.)

To all whom it may concern:

Be it known that I, HORACE H. TAYLOR, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Magneto-Electric Machines, of which the following is a specification.

My invention applies to both dynamo and motor types of machine but the motor type only is illustrated herein for the reason that the change from motor to generator can be made without invention by anyone versed in the art.

One object of my invention is to reduce the amount of idle wire in the armature:—the amount of cross connection being very small in comparison with the effective wire.

Another object is to avoid the labor and expense of wound armatures.

Another object of my invention is to reduce the friction caused by cutting through the magnetic lines of force, thereby avoiding destruction by burning of the insulation around the wires.

Another object of my invention is to so construct the armature as to avoid all friction of air between the pole pieces and the periphery of the armature, by making the periphery perfectly smooth and bringing the armature and pole pieces as close together as practicable.

Another object of my invention is simplicity of construction and facility of repair and to make provision whereby I can remove and replace any injured wire without interfering with the other wires of the armature.

Another object of my invention is to provide an electric motor for transportation purposes in which the position of the built up electro magnetic force can be changed at pleasure thus allowing the motor to be operated in either direction with equal effect.

The accompanying drawings illustrate my invention.

Figure 1 is a side elevation of a four pole motor embodying my invention. Fig. 2 is a front elevation of the same. Fig. 3 is a rear elevation. Fig. 4 is a view of the front end of the armature with wires leading down to the commutator bars. Permanent pole pieces are also indicated. Fig. 5 is a view of the other end of the armature showing the cross connection of the wires in position. Fig. 6 is a perspective view of the armature with a portion broken away to expose the interior of the ring. Only four wires are shown in this view to avoid confusion of lines. Fig. 7 is a perspective view looking at the front end of the armature and indicating the connection of the said four wires with the commutator. Fig. 8 is a longitudinal mid-section on line x—x Fig. 4. In this view the wires are arranged in cables of suitable size to correspond with the size of the longitudinal perforations in the armature. Fig. 9 is a perspective view of the commutator and the four wires shown in Figs. 6 and 7 without the armature, but maintaining their proper positions.

My invention comprises an electro-magnetic machine provided with an armature having two concentric numerically equal series of longitudinal wire-containing perforations arranged in co-radial pairs and having a series of U shaped conductors arranged respectively with one terminal in an outer perforation and connected with that segment of the commutator co-radial with such perforation, and the other terminal returned through an inner perforation and connected with the commutator segment co-radial with such inner perforation; the two terminals being adapted and arranged to simultaneously cut through equal north and south magnetic lines of force when the armature is rotated.

My invention also comprises an electro-magnetic machine provided with movable auxiliary pole pieces arranged respectively at each side of the permanent or stationary pole pieces of the machine and adapted and arranged to be moved toward and from and to fit close to (but not upon) the periphery of the armature.

In the drawings A indicates the armature core. a indicates the series of outer perforations; a' the series of inner perforations.

B indicates the U shaped armature wires or conductors.

b^+ indicates one of the terminals and b^- indicates the other terminal of each of such wires. The several wires when marked with reference letters are distinguished from each other by numerals 1, 2, 3, &c.

For convenience the signs + and — are used in connection with reference letters to indicate positive and negative parts. It is to be understood, however, that the polarity of the parts alternate as in other machines.

C indicates the commutator and *c* indicates the commutator segments. The positive terminal of one wire and the negative terminal of another wire are arranged co-radial and are both connected with one segment of the commutator. This is true with the whole series of wires and segments throughout.

It is to be understood that either a single wire, or a cable formed of many wires can be used to form the U shaped conductor. The size of the perforations and the core bridge there-between must be so proportioned to each other as to secure sufficient strength and also give sufficient body of iron to form the required magnet. By this construction the energizing of any one of the conductors produces a magnet within the armature, the poles of which magnet correspond with the terminals of the conductor. This arrangement of the wires or commutators of the armature is adapted for bipolar or multipolar machines of any type and the construction of such machines is so well known that further description of my improved armature is considered unnecessary.

In practice, the energizing current passing from one brush to the other through the commutator and conductor does not make any unnecessary turns and the only portion of the conductor which is idle is the cross connection *b''*.

E, 1^E, 2^E, &c., indicate the several stationary pole pieces each of which is provided with two movable auxiliary pole pieces *e e'* pivoted upon the opposite sides of the stationary pole pieces and are operatively connected with each other through suitable mechanism such as bars F F', &c. The movable pole pieces *e e'* are magnetically connected with their respective pole pieces E, 1^E, &c., and the movable pole pieces *e e'* of each stationary pole piece are insulated from the bar F' or other device which connects it with the movable pole pieces of another stationary pole piece.

h indicates the insulation.

f indicates a handle by which the system of levers and bars may be operated to move the pole pieces.

g indicates the pivots which pivot the movable pole pieces to stationary pole pieces.

A portion of Fig. 2 is broken away to show the insulation *h*.

In practice the movable pole pieces can be adjusted so as to stand at equal distances from the armature and thus their effect is neutral. When the machine is in operation, the electro motive force is built up, at one side of each of the stationary pole pieces respectively. The handle *f* or levers F F', &c., are then manipulated by the electrician to bring close to the armature those movable pole pieces which are upon the side of the stationary pole pieces opposite the built up magnetic force. This operates to bring the built up magnetic force nearer the center of the stationary pole pieces, thus returning the lines of force to their normal position and form and thus causing the armature to receive the magnetic lines of force more directly than when such lines are deflected from their normal course and from the stationary pole pieces by the built up magnetic force.

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

1. An electro magnetic machine provided with an armature having two concentric numerically equal series of longitudinal wire containing perforations, and having a series of U shaped conductors arranged respectively with one terminal in an outer perforation and connected with one commutator segment, and the other terminal returned through an inner perforation and connected with a magnetically opposite commutator segment; the two terminals being adapted and arranged to simultaneously cut through equal north and south magnetic lines of force when the armature is rotated.

2. An electro magnetic machine provided with an armature having two concentric numerically equal series of longitudinal wire-containing perforations arranged in co-radial pairs and having a series of U shaped conductors arranged respectively with one terminal in an outer perforation and connected with that segment of the commutator co-radial therewith and the other terminal returned through an inner perforation and connected with the commutator segment co-radial with such inner perforation; the two terminals being adapted and arranged to simultaneously cut through equal north and south magnetic lines of force when the armature is rotated.

3. An electro magnetic machine provided with movable auxiliary pole pieces arranged respectively at each side of the permanent pole pieces of the machine and adapted and arranged to be moved toward and from, and to fit close, to the periphery of the armature.

4. An electro magnetic machine having each of its stationary pole pieces provided with two movable auxiliary pole pieces pivoted upon the opposite sides of the stationary pole pieces and operatively connected with each other by suitable pole piece operating mechanism operatively connected with such pole pieces.

HORACE H. TAYLOR.

Witnesses:
ALFRED I. TOWNSEND,
F. M. TOWNSEND.