LONTIN & D'IVERNOIS.

Magneto Electric Machine.

No. 94,014. Patented Aug. 24, 1869.

Fig: 1.

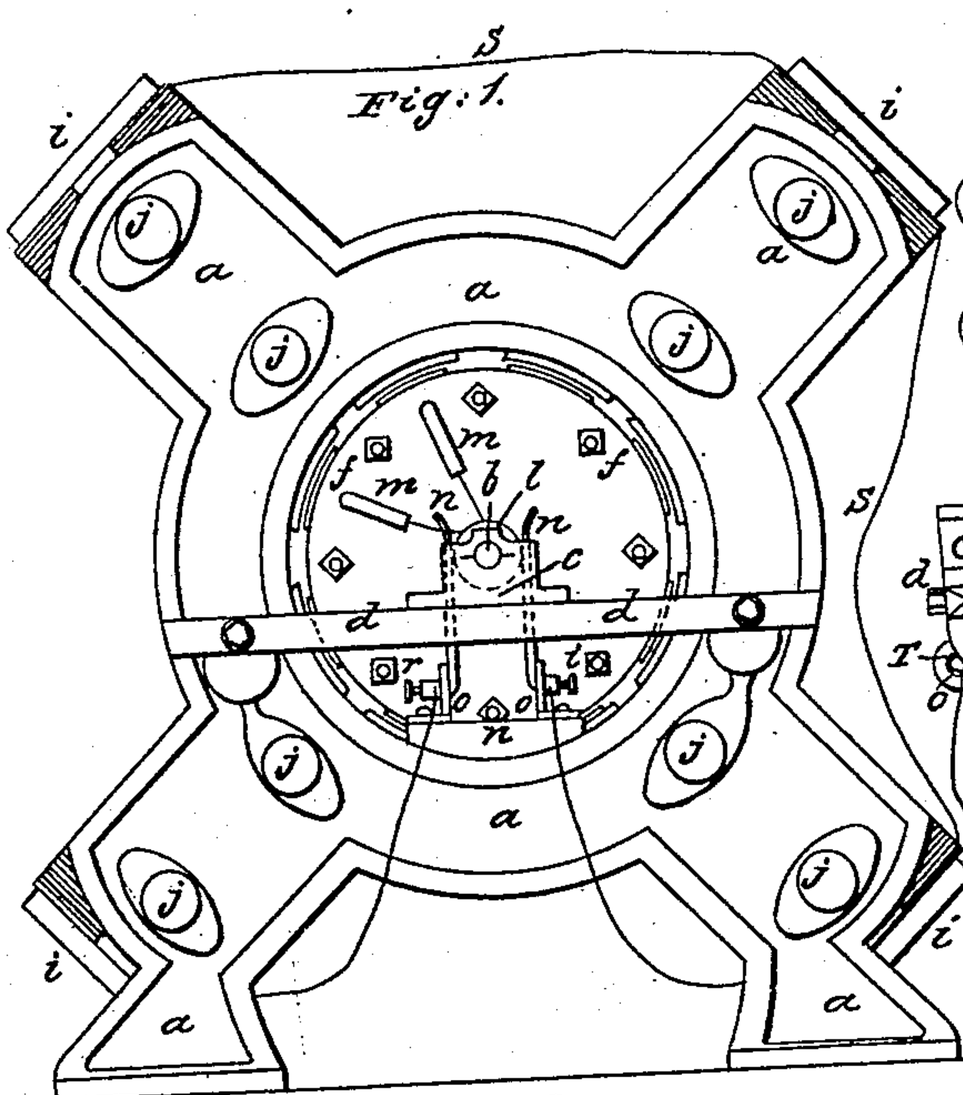


Fig: 2.

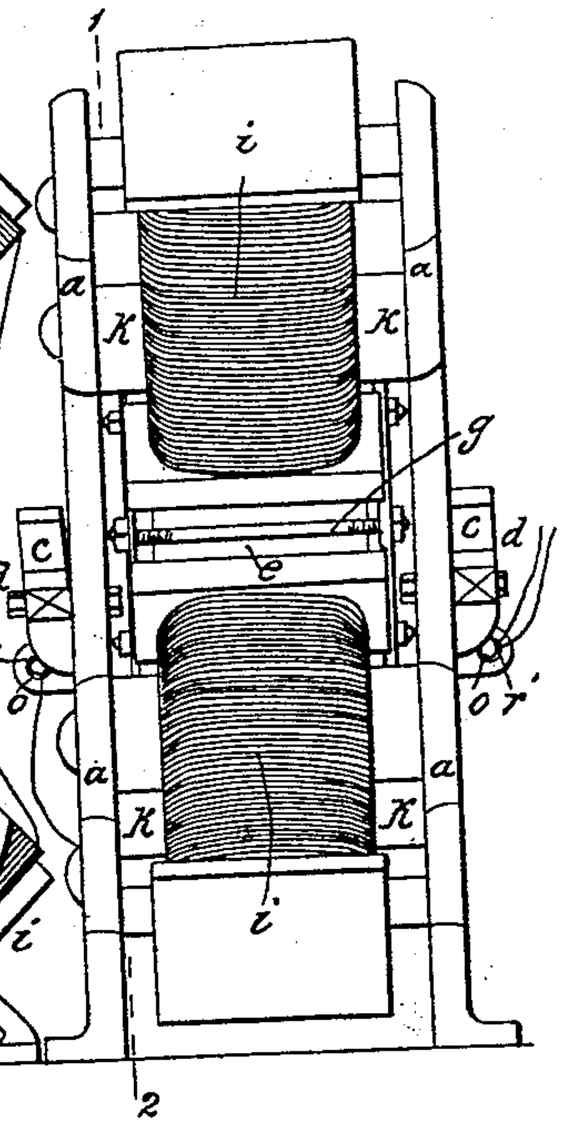


Fig: 3.

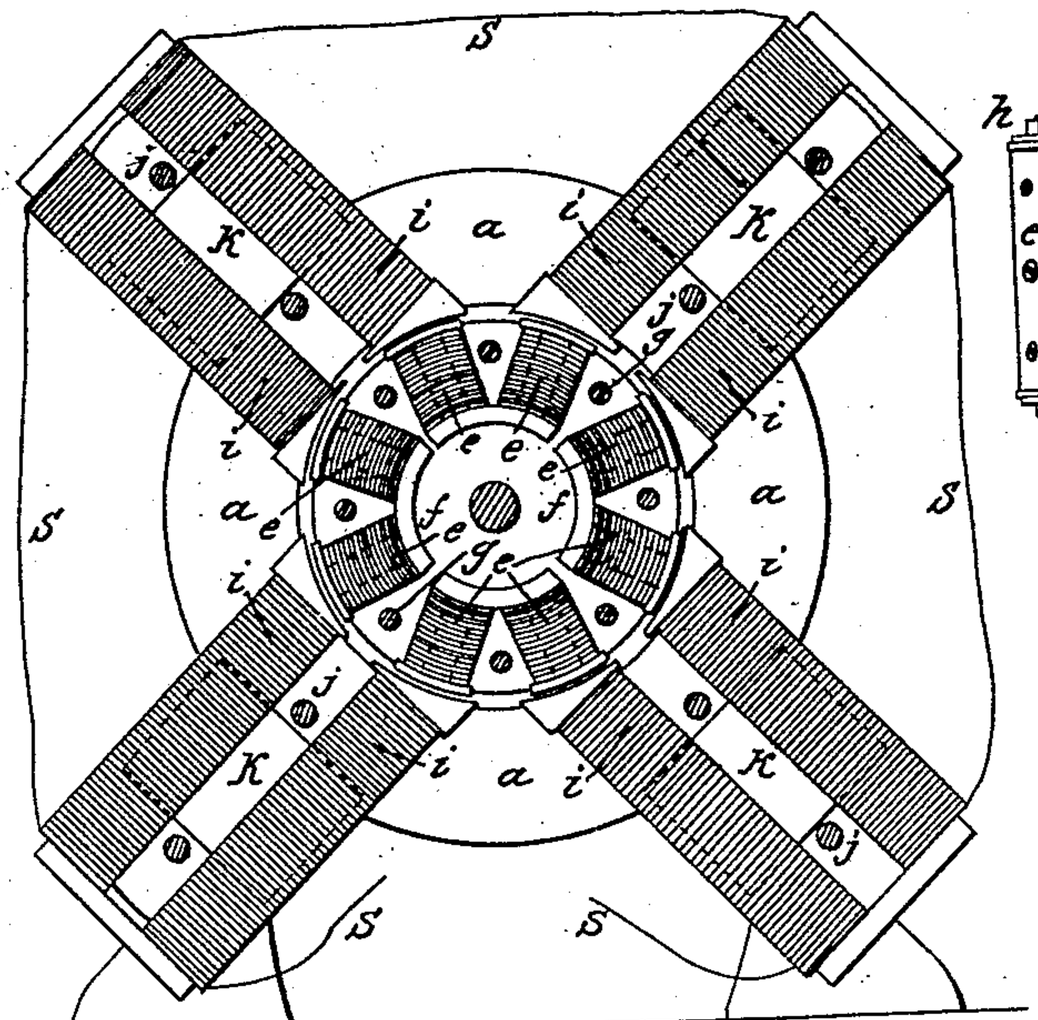


Fig: 4.

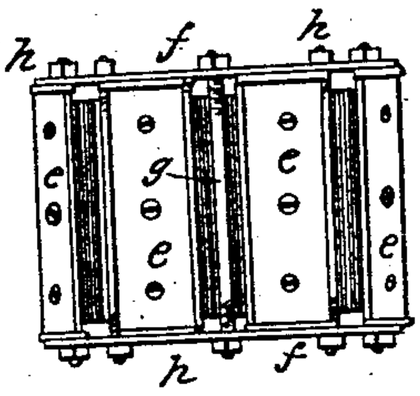
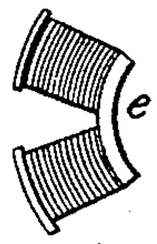


Fig: 5.



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Letters Patent No. 94,014, *dated August* 24, 1869; *patented in France, December* 14, 1868.

IMPROVEMENT IN MAGNETO-ELECTRIC MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, DIEUDONNÉ FRANCOIS JOSEPH LONTIN and EARDLEY LOUIS CHARLES D'IVERNOIS, of the city of Paris, in the Empire of France, have invented new and useful Improvements in Magneto-Electric Machines; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification.

This invention refers to improvements in magneto-electric machines, which will be hereinafter fully described; but we think it important to first state that it is well known that an electro-magnet, operated by a magneto-electric machine, acquires a magnetic attractive power superior to that of the machine-feeding magnets.

Up to the present time many magneto-electric machines, based on the use of such increase of magnetic power, so as to obtain stronger electric currents, had the great inherent inconvenience of not producing electric currents sufficiently strong for industrial use, but by means of an excessive rotating speed, which cannot possibly be kept up in practice without destroying the machine and the shaft-bearings rapidly.

Our improved machine makes entirely available the increase of magnetic power developed through the means just alluded to, with as moderate rotating speed as desired.

This invention, which comprises new arrangements and applications of the magneto-electric machine, and which makes the object of the present application for Letters Patent of the United States, consists in certain improvements upon that class of machines which has upon the same rotating axis several bibranched soft-iron armatures, having the form of electro-magnets, but non-magnetized, and the parts or poles of which, were these armatures magnetized, are placed on the same circumference, the curve of which they assume.

From this double arrangement, it results that at every revolution of the rotating shaft, each soft-iron armature shall pass before all the poles of the exterior stationary electro-magnets, and that electric currents will be developed.

These armatures and electro-magnets are covered with zinc, brass, iron, or any other metallic or alloyed wire, either round, square, or flat, or in strips having the whole breadth of the irons to be covered, with or without a coating of any insulating-material, and wound up in the usual manner, and which, in case very thin wires were used, should be set with several at once.

The number of the armatures on the rotary axis and that of the external electro-magnets is unlimited, and may be two, three, four, five, six, ten, twenty, &c., either odd or even numbers.

The number of the armatures may also be less than that of the electro-magnets, or the number for both may be the same.

In order to enable such as are skilful in the art to construct and execute the invention, we have represented the same in the accompanying drawings, wherein—

Figure 1 shows, in vertical elevation, a front view of the magneto-electric machine of our system;

Figure 2 shows, in vertical elevation, an edge view of the same;

Figure 3 shows, in vertical elevation, a front sectional view of the same through the line 1–2, fig. 2;

Figure 4 shows, in detail, a plan of the whole armatures; and

Figure 5 shows, in detail, one of the said armatures.

Similar letters of reference indicate corresponding parts.

The specimen which we have represented in the drawings is provided with four armatures and four electro-magnets.

a a are two cast-iron cheeks, forming the frame intended to support the various parts of the machine; they are kept up apart properly by bolts *j j*.

b is a rotary shaft, made to rotate in two bearings, *c c*, secured in bars, *d d*, connected to the frame.

On this shaft a pulley is keyed, to which is imparted motion from any motor.

e e e' e' are four bibranched armatures, fitted circularly round the shaft *b*. They are held in position and in connection with the shaft, by two disks or cheeks, *f f*, keyed on the latter, and connected together by rods *g* bolted thereto.

These armatures are wound round with wire in the usual way; they are insulated electrically from the disks *f f* by pasteboard slips, *h*, fig. 4, or any other material which is a non-conductor of electricity.

i i i i are four electro-magnets fixed on frame *a*, and the poles of which are cut circular so as to be located in a circumference very close to that described by the armature-poles—so-called "poles" from analogy of functions.

k are wooden plates, or made of any material non-conductor of electricity, and insulating the electro-magnets *i* from the frame *a*.

l l' are current-redressing commutators fitted to shaft *b*, on each side of cheeks *f f*, the one, *l*, fig 1, communicating electrically through the wires *m m* with the armatures *e e*, and the other, *l'*, not shown, (as it is placed symmetrically on the opposite side of the frame,) communicating with the armatures *e' e'*.

n n, spring-blades, rubbing on the commutators; these blades are fixed to metal squares, *o*, resting on a wooden wedge, *p*, connected with the machine-frame.

r r', posts, with which each square, *o*, is provided.

From the post *r* of the commutator *l* starts a wire, which, after connecting electrically the four electro-magnets, comes back up to the post *r'* of the same commutator, as shown at fig. 1, and from each post of the commutator *l'* starts a distinct wire, fig. 2, both wires serving to collect the electrical power of the machine.

From the above specification, and by reference to the annexed drawings, it may be seen that there are on one part four soft-iron armatures, *e e e' e'*, which are liable to receive a rotary motion from being carried by the shaft *b*, and in the second place, four electro-magnets, *i i i i*, slightly magnetized initially by any means, and fixed on the frame *a*.

If, therefore, the shaft *b* is rotated, it will be seen that within a single revolution each armature, *e e e' e'*, will pass eight times before the poles of the electro-magnets *i i*, and, consequently, produce its effect eight times.

Now, in many machines in use up to this day, the inductive effect is produced only twice by every revolution, so that one is compelled, in order to obtain a sufficient continuous current, to give a speed of from twenty-five hundred to thirty-five hundred revolutions a minute, a speed which it is impossible to keep up long in practice.

With a machine constructed as shown, the rotary speed of the shaft is only the fourth part of that required for the common ones, and may be but the sixth, eighth, tenth, fifteenth, twentieth part thereof, according to the number of electro-magnets and armatures used.

This, our improvement, the immense result of which is to diminish the rotary speed to such an extent, being now specified, we will describe the manner in which electricity is produced.

When the shaft *b* is rotated, the armatures *e e e' e'* describe a circular motion opposite to and at the least possible distance from the poles of electro-magnets *i i i i*, and they get magnetized influentially, which produces a certain amount of electricity in the covering-wire.

The electricity evolved from the electro-magnets *e e* is collected by means of the commutator *l*, and conveyed through the wire *s* to the wire of the magnets *i i*, which are thus strongly and surfeitingly magnetized if the rotations be sufficiently rapid.

These electro-magnets *i i*, by this means, will generate in the wire of armatures *e' e'* a considerable amount of electricity, which is collected by the commutator *l'*, for its application to all uses and purposes that electricity may be fit for.

We reserve the right to fit on the shaft *b* an intervening disk between those, *f f*, arranging on one side armatures *e*, which will send the current to the electro-magnets *i*, and on the other side placing armatures *e e'*, which will collect the electricity evolved by the machine. These armatures may be of either equal or unequal size.

In this case, the armatures *e e e' e'* should be placed sidewise instead of consecutively.

In this case, again, the poles of the different armatures may be placed opposite to one another, or be interpolated at will.

Our invention comprises these two arrangements, and also the one as represented in the drawings.

As the remanence in the iron of electro-magnets which produce the magnetic power is liable to lower considerably, enough for preventing the immediate start of the magneto-electric machine when left for a long time unemployed, we might introduce in the formation of such electro-magnets a certain amount of steel, which being once magnetized would more readily hold up magnetic remanence, which steel might be also tempered so as to hold magnetism indefinitely.

The steel may be so placed to form the base-plates of the electro-magnets or ends of the same, that it may become attractive poles.

These electro-magnets may with less advantage be wholly steel, or an association of iron and steel, soldered or not, to form the bodies or cores, in which latter cases the electric power of the machine would be less.

What we claim, and desire to secure by Letters Patent, is—

A magneto-electric engine, consisting of the bi-branched electro-magnetic armatures, radially disposed upon the rotating shaft, in combination with the stationary magnets, which are initially magnetized, when arranged in such a manner that the current generated in one series of rotating armatures is conveyed to the fixed magnets, and then, on the rotation of the shaft, excites a current in another series of rotating magnets, which can be utilized at will, in the manner and for the purpose as described.

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