(No Model.)

T. A. EDISON.

DYNAMO ELECTRIC MACHINE.

No. 298,954. Patented May 20, 1884.

Fig. 1.

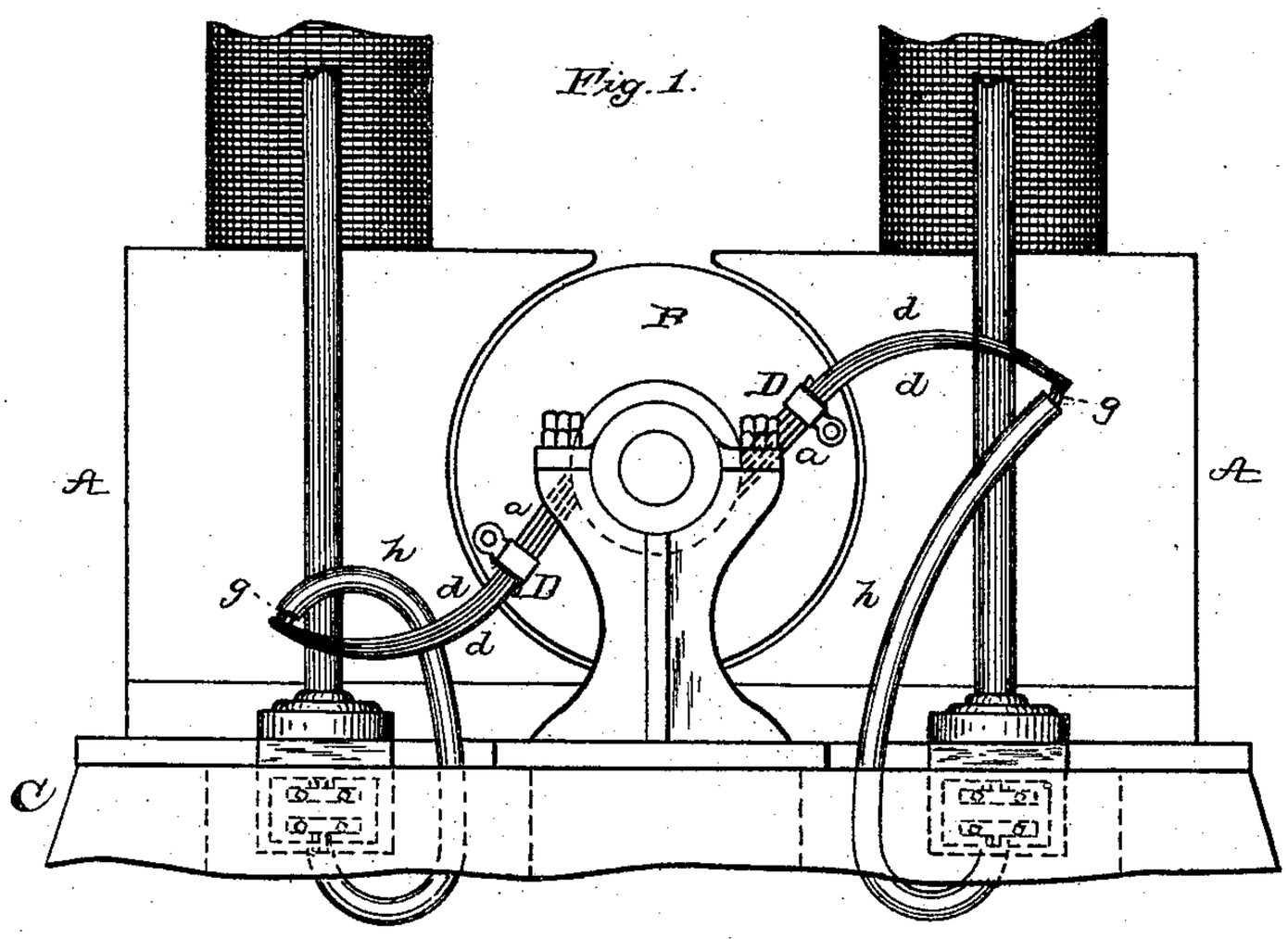


Fig. 2

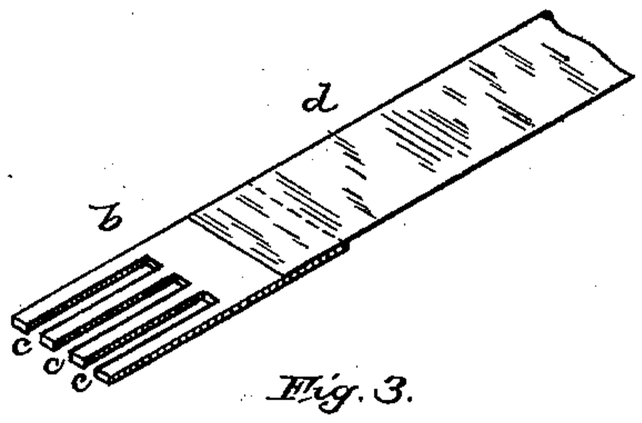


Fig. 3.

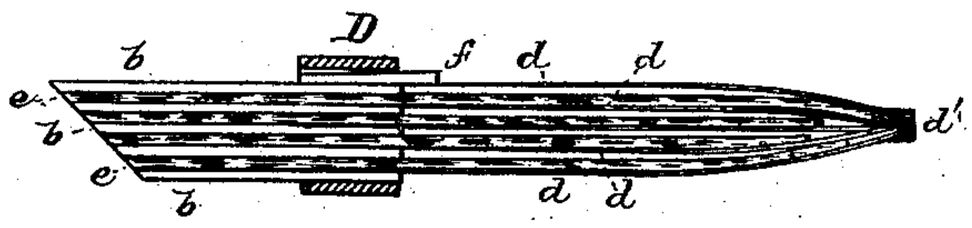
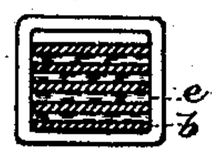


Fig. 4



ATTEST

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THOMAS A. EDISON, OF MENLO PARK, NEW JERSEY.

DYNAMO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 298,954, dated May 20, 1884.

Application filed December 12, 1883. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, of Menlo Park, in the county of Middlesex and State of New Jersey, have invented a new and useful Improvement in Dynamo-Electric Machines, (Case No. 600,) of which the following is a specification.

In my Patent No. 276,233, dated April 24, 1883, are set forth the advantages of the use of current-collectors forming bridges of high resistance between the bars of the commutator-cylinder of a dynamo-electric machine or electro-dynamic motor, whereby the spark at the commutator-bars, due to the breaking of local circuits, is prevented, and in said patent is described the use for this purpose of current-collectors of inferior conducting capacity, making inferior contact at the surface of the commutator-cylinder.

My present invention relates to a different means of forming such high-resistance connections between the commutator-bars. Instead of making inferior contact at the commutator-cylinder, or forming the current-collector of inferior conducting material, I place the desired high resistance external to the current-collector, between it and the point of connection with the main conductor leading from the machine. I do this by using a divided commutator-brush composed of alternate layers of metal, preferably copper, and insulating material, and connecting all the metallic layers together through external conductors having the desired high resistance. The local current then, which passes through the brush from one commutator-bar to another, encounters the resistance of these separate conductors, having to pass through them to and from their point of connection together; and, therefore, as explained in the patent above referred to, this local current will be weak and the breaking at the surface of the cylinder of the local circuit will produce little or no spark.

My invention is illustrated in the annexed drawings, in which Figure 1 is a view in elevation of a portion of a dynamo-electric machine embodying said invention; Fig. 2, a view of one of the strips of the commutator-brush with the resistance-conductor attached thereto; Fig. 3, a side view of the brush and resistance-conductor with the clamping-sleeve in section, and Fig. 4 a cross-section of the brush.

A A are the field-magnet poles of a dynamo-electric machine or electro-dynamic motor. B is the armature thereof, and C the bed-plate, the lower portion of which is broken away in the drawings.

The commutator-brushes *a a* are each formed of several strips, *b*, of copper or other suitable metal, whose bearing ends are preferably divided by several slots or notches, *c c*, to divide and diminish spark at the ends.

To each metal strip *b* is attached a thin strip of metal, *d*. This may be copper, in which case it would be made of the desired resistance by properly proportioning its length and sectional area; or a strip of German silver or other high-resistance metal may be used, which would of course be larger and shorter than a copper strip. The ends of all these strips are soldered together at *d'*.

Between the metal strips of the brush are placed layers *e* of insulating material. Mica or asbestus is a suitable material for this purpose. The insulating-layers extend back close to the ends of the resistance-strips, and such ends are soldered together, and are all connected to the main conductor. Around the brush, at the outer end of the bearing-strips, is placed a sleeve of insulating material, which holds the metal and insulating-strips together, a wedge, *f*, of wood or other suitable material, being inserted within the sleeve to secure the whole tightly.

Instead of a single bearing-strip, *b*, with its end divided into fingers, several separate strips or wires may be secured to the resistance-strip *d*. The insulating-strips *e*, preferably, but not necessarily, are similarly divided. The ends of all the metal strips bear upon the commutator-cylinder, and the local circuit formed when the brush bridges the commutator-bars is around the outer end of the resistance-strips.

Any suitable number of current-collectors to produce the total conductivity required may be used on each side of the commutator-cylinder.

The circuit-connections from the ends of the resistance-strips are preferably made in the

manner shown, conductors *g* extending through insulating-tubes *h* to clamping-plates on the bed-plate of the machine.

It is evident that many details—such as the form and arrangement of the external resistances—may be modified without departing from the spirit of my invention.

What I claim is—

1. An electrically-divided current-collector each of whose divisions is of such width as not to bridge the space between the commutator-bars, in combination with a resistance external to said brush, forming a high-resistance bridge between said bars, substantially as set forth.

2. The current-collector formed of alternate layers of metal and insulation, in combination with resistances external to said current-collector through which the metal layers are connected, substantially as set forth.

3. The combination of the metal-bearing strips or wires of a current-collector, resistances attached thereto and connected together and to the main conductor, and insulating material between the bearing ends and between the resistances, substantially as set forth.

4. The combination, with the metal bearing-strips and the interposed insulation, of the insulating-sleeve holding them together, substantially as set forth.

5. The combination, with the metal bearing-strips and the interposed insulation, of the insulating-sleeve and wedge holding them together, substantially as set forth.

6. The current-collector formed of strips of metal and interposed insulation, in combination with resistance-strips attached at one end to said metal strips, and all connected together at their other ends, substantially as set forth.

This specification signed and witnessed this 15th day of November, 1883.

THOS. A. EDISON.

Witnesses:
H. W. SEELY,
EDWARD H. PYATT.