R. CORNELIUS.

FRICTIONAL ELECTRIC MACHINE.

No. 32,354. Patented May 21, 1861.

Fig. 3.

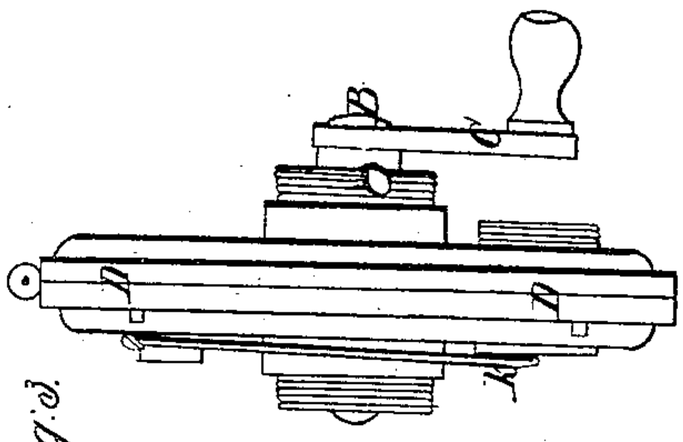


Fig. 6

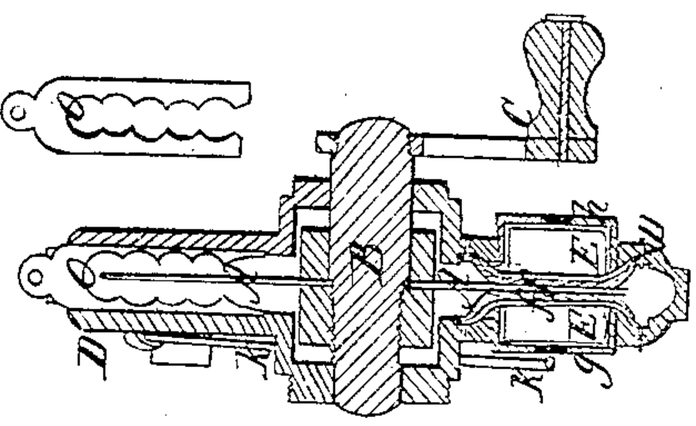


Fig. 10.

Fig. 2.

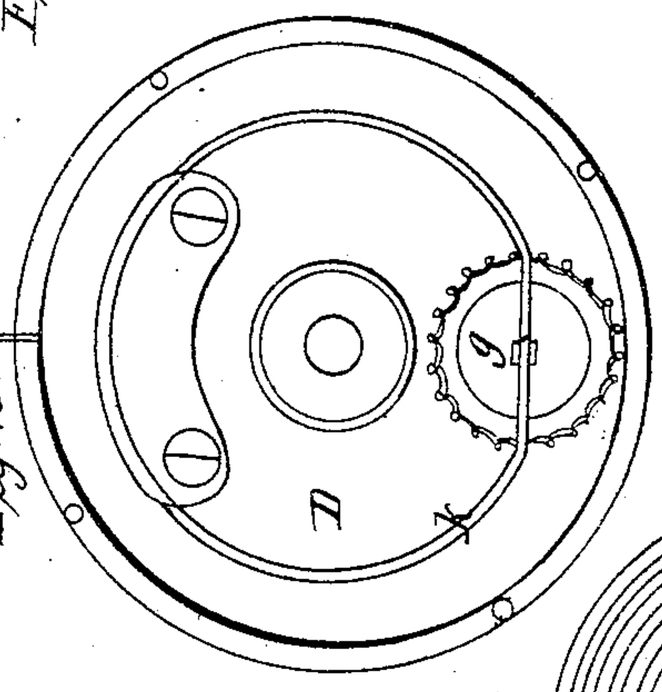


Fig. 1.

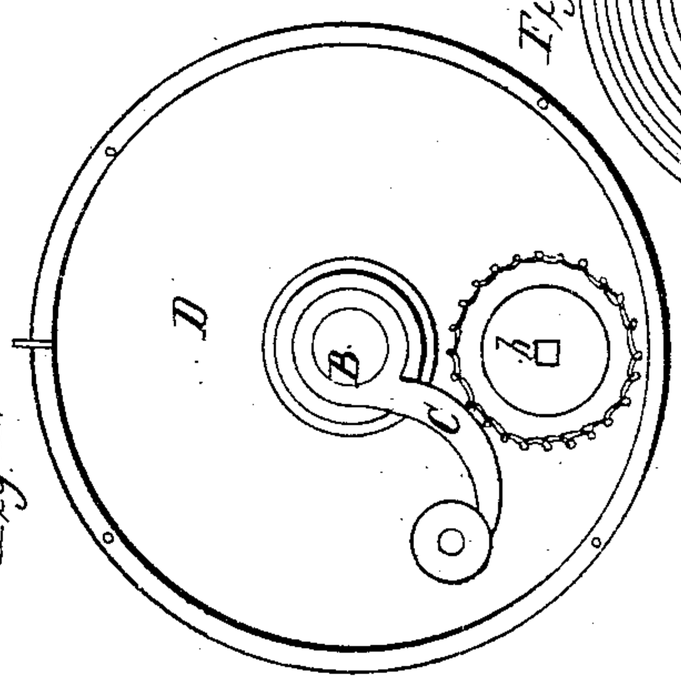


Fig. 8.

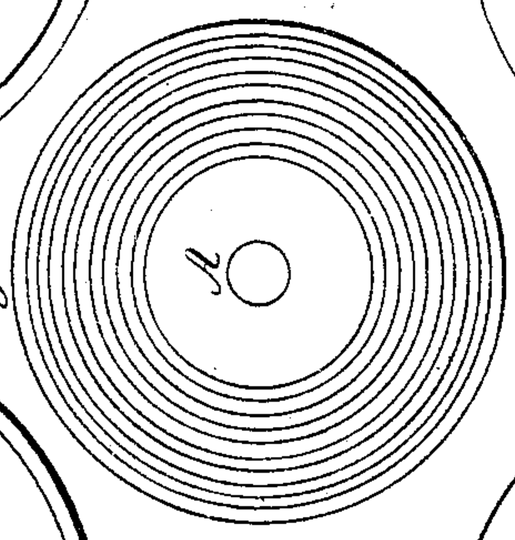


Fig. 9

Fig. 7

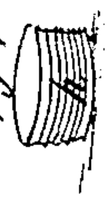


Fig. 5.

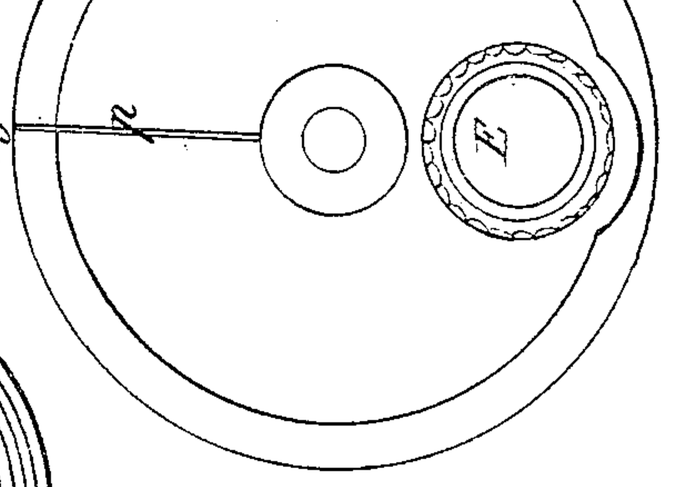
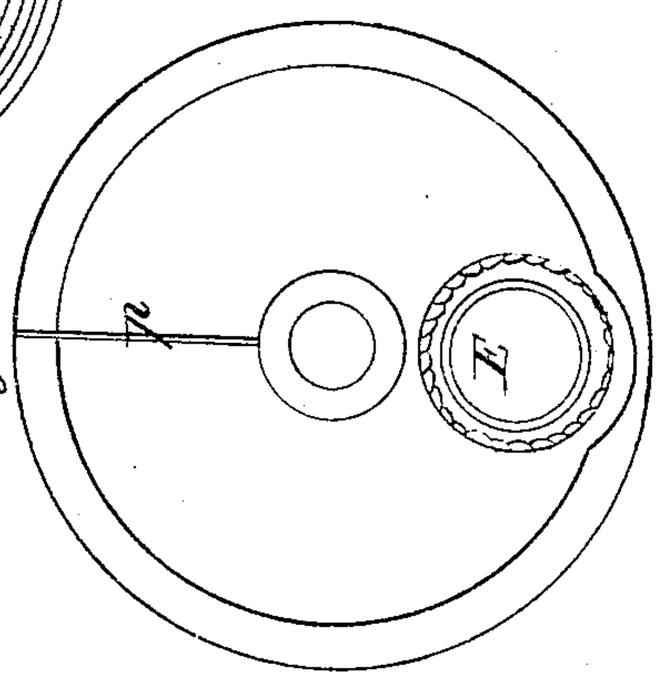


Fig. 4.



Witnesses;
J D Bagley
J Thurnbild

Inventor;
Robert Cornelius

UNITED STATES PATENT OFFICE.

ROBERT CORNELIUS, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVED FRICTIONAL ELECTRIC MACHINE.

Specification forming part of Letters Patent No. **32,354**, dated May 21, 1861.

To all whom it may concern:

Be it known that I, ROBERT CORNELIUS, of Philadelphia, in the State of Pennsylvania, have made certain new and useful Improvements in the Construction of Electric Generators; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figures 1 and 2 represent the outside views of the sides; Fig. 3, an end view; Figs. 4 and 5, inside views corresponding to Figs. 1 and 2; Fig. 6, a sectional view, showing the interior arrangement; Figs. 7 and 9, two views of the detached boxes; Fig. 8, a detached view of the revolving disk; Fig. 10, a detached view of the collector.

Heretofore electric generators of small size have been composed of a revolving disk of some non-conducting material inclosed in a non-conducting case; but there were certain defects in the construction of these electric generators which have seriously impaired their practical value and efficiency. In the first place, the leather which presses against the revolving disk being inclosed entirely in the case, it was impossible to adjust it to the disk without taking the apparatus to pieces, and even then it could not be effectually done, as the putting of the parts together would change the adjustment. Again, the rubbers have been heretofore made of leather and placed upon a metallic base and pressed against the disk by a spring. The rubber, in time, by the continual pressure of the leather between the metal back and the disk, causes its surface to become hard and unyielding, thereby impairing its efficacy as an exciter of electricity. Much inconvenience has hitherto been experienced from the want of a complete adjusting arrangement and an efficient rubber in these inclosed electric generators.

My improvement consists, first, in so constructing these electric generators inclosed in cases that the rubber is connected externally with the spring and with the adjusting apparatus, or with either, instead of having these parts inclosed within the case; secondly, in constructing the rubber with an elastic backing, of leather or cloth, having a tin or metallic foil interposed between the leather and the packing, whereby the full elasticity of the rubber is maintained, and at the same time its efficacy as a generator of electricity is retained by the employment of the metal foil; thirdly, in a convenient mode of inclosing the cushion and its packing in the recess in the case or box inserted in the case; fourthly, in an improved arrangement of spring and adjusting-screw for maintaining a uniform and regular pressure of the rubber upon the revolving disk in the case.

I have also found that by placing a series of grooves around each surface of the disk its action in generating electricity is more prompt at the first start.

The electric generator is constructed as follows: A disk, A, of hard rubber or other non-conducting material, is put upon an axis, B, attached to which is a handle, C. The disk A is surrounded by a case, D D, made of hard rubber or other non-conducting substance.

E are the rubbers, pressing on each side of the revolving disk A. They are made of a piece of soft leather fastened to the outer casing, D D, by their edges. An opening is made through the casing over this leather, in which metallic cups *g h* are placed.

In order that the rubbers may be pressed firmly against the revolving disk, a spring, *k*, presses firmly against the cup *g*, which, in its turn, presses the leather against the disk. The opposite rubber is pressed tightly against the disk by means of the cup *h*, which is provided with a screw, by means of which it may be screwed in and out. If these cups were solid metal, the leather would soon become hard. To obviate this difficulty I fill the cups with cloth, rubber, or other soft substance, and between this filling and the leather I place a small piece of metallic foil. This metallic foil is in contact with the metal cup, and thus the rubber preserves the quality necessary to excite electricity, while at the same time its elasticity is improved. The electricity thus generated is collected upon the collector O, (shown in Fig. 10.) This is of the form shown in the figure, and slides in the grooves *p p* on the case, Figs. 4 and 5.

It is seen that the spring *k* causes the pressure of the rubbers to be uniform.

A spring might be attached to both rubbers,

or each cup might be provided with a screw and sewed against the disk.

Should the rubber be too loose or too tight, it is easily regulated by means of screwing the cup in or out.

By corrugating the disk A the rubber will press more firmly against it, and electricity would be more easily generated.

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

1. Applying the spring or adjusting-screw to the rubber outside of the case and bringing the same into action through the case.

2. The employment of the elastic backing for the rubber, in combination with the metallic foil placed between the back of the rubber and elastic cushion.

3. The placing of the elastic cushion in a recess of the case or in a metallic box made to fit in a recess in the case.

4. The employment of the circular spring *k*, in combination with the rubber.

5. The combination of the adjusting-screw *h* and the circular spring *k*, arranged and operated as above described.

6. Attaching the leather facing of the rubber directly to the casing.

7. The manner of constructing and attaching the collecting-piece O between the two grooves in the box, substantially as above described.

8. The employment of a series of grooves around the surface of the disk, for the purpose described.

ROBERT CORNELIUS.

Witnesses :
J. G. MINÉ CHILD,
F. D. BOQUET.