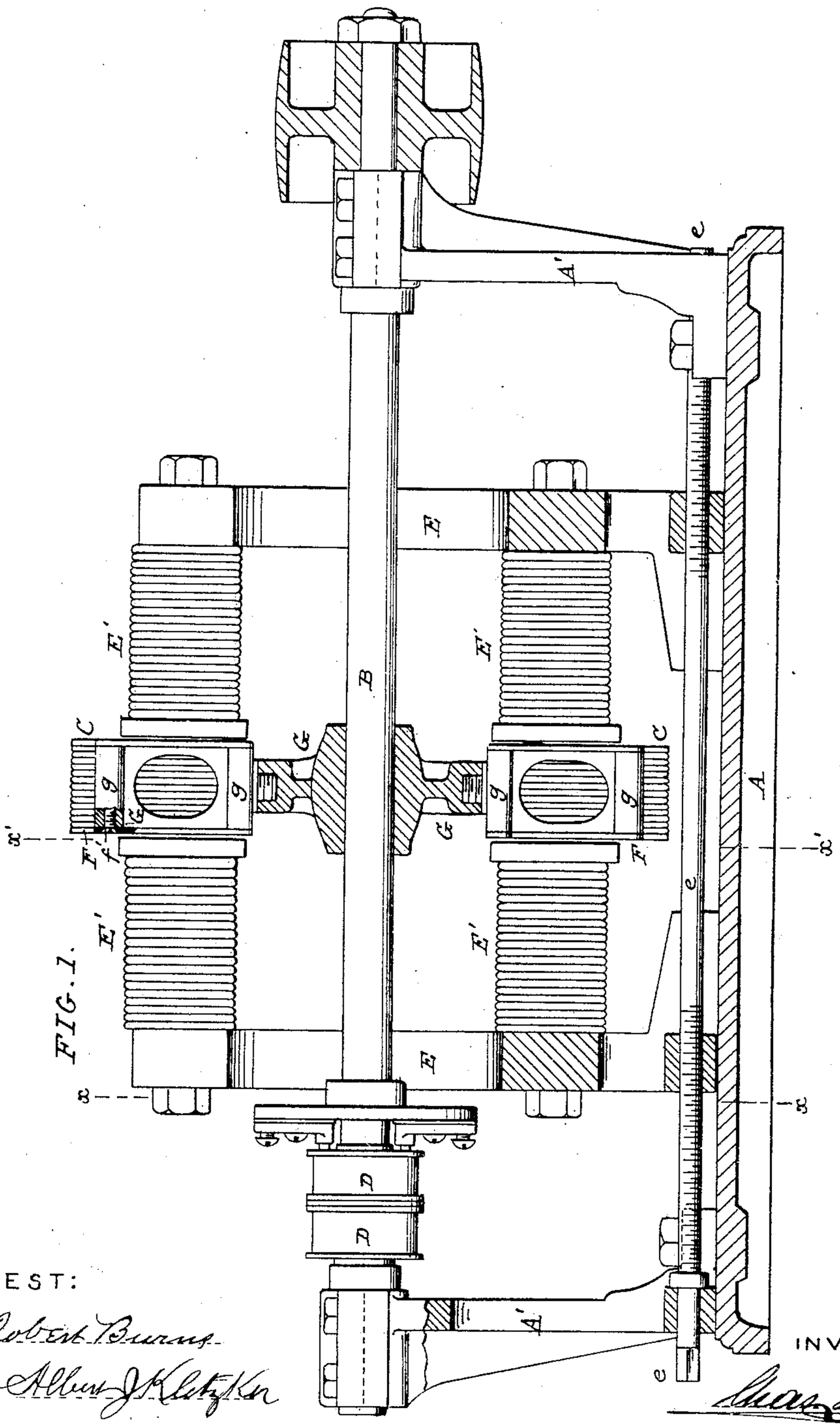
(No Model.) 3 Sheets—Sheet 1.

C. HEISLER.

MAGNETO ELECTRIC MACHINE.

No. 262,590. Patented Aug. 15, 1882.



ATTEST:

Robert Burns.

Allen J. Klotzsch

INVENTOR:

Chas. Heisler.

(No Model.)

3 Sheets—Sheet 2.

C. HEISLER.

MAGNETO ELECTRIC MACHINE.

No. 262,590. Patented Aug. 15, 1882.

FIG. 4.

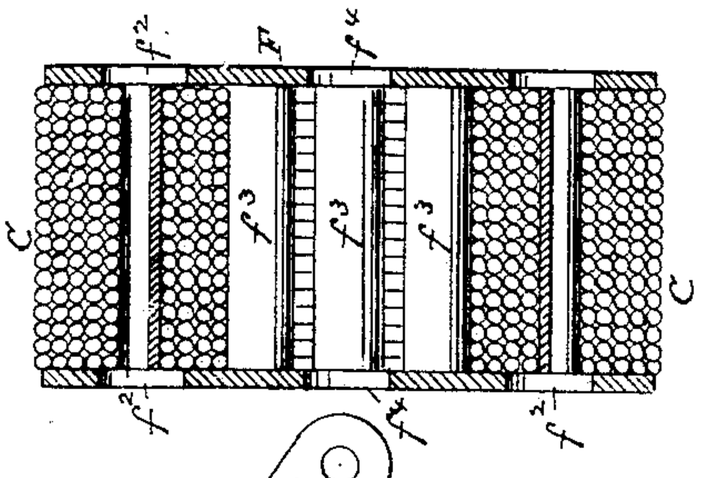


FIG. 12.

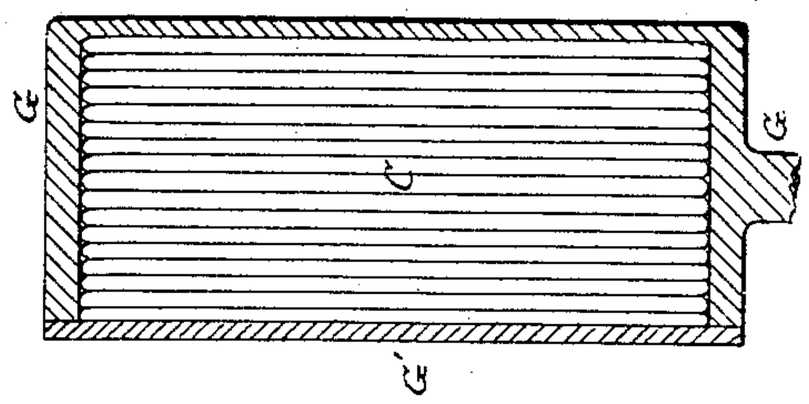


FIG. 13.

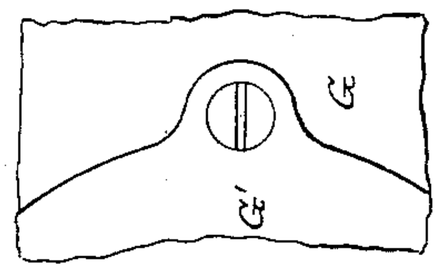


FIG. 5.

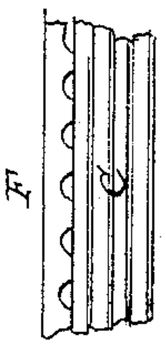


FIG. 3.

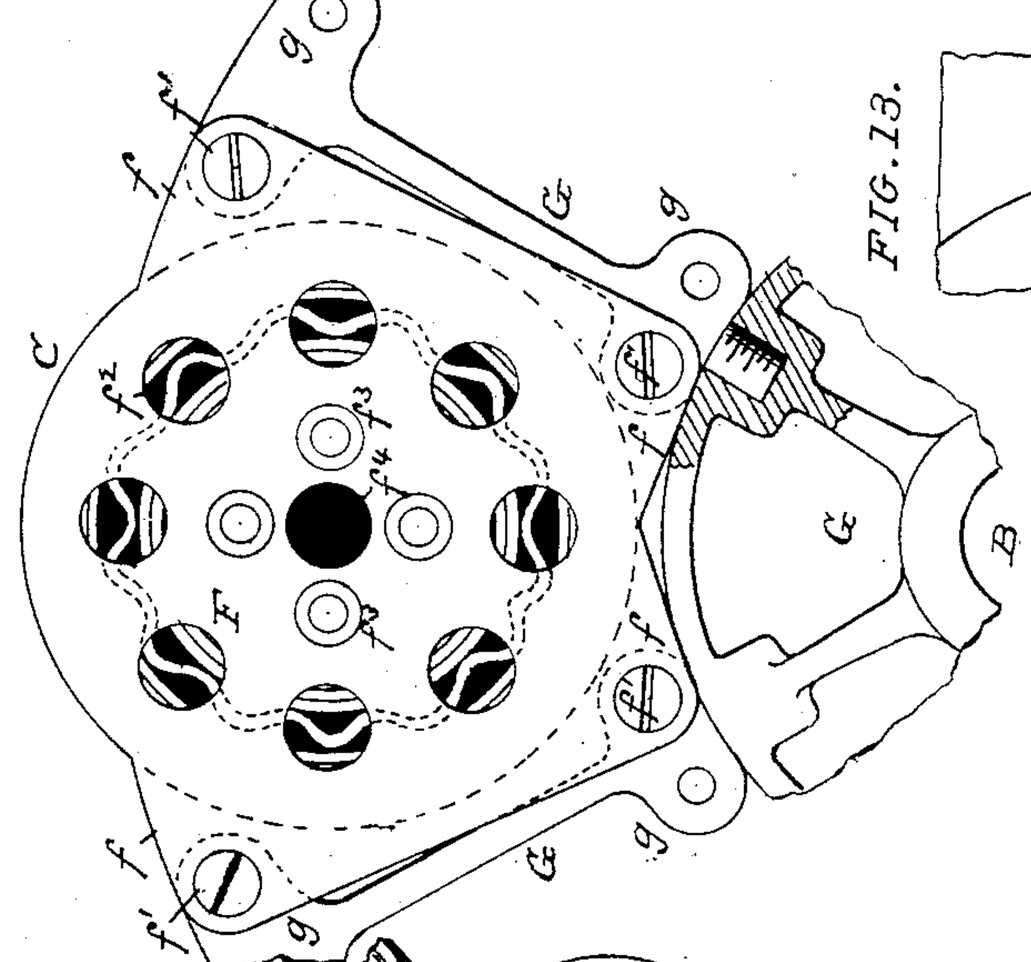
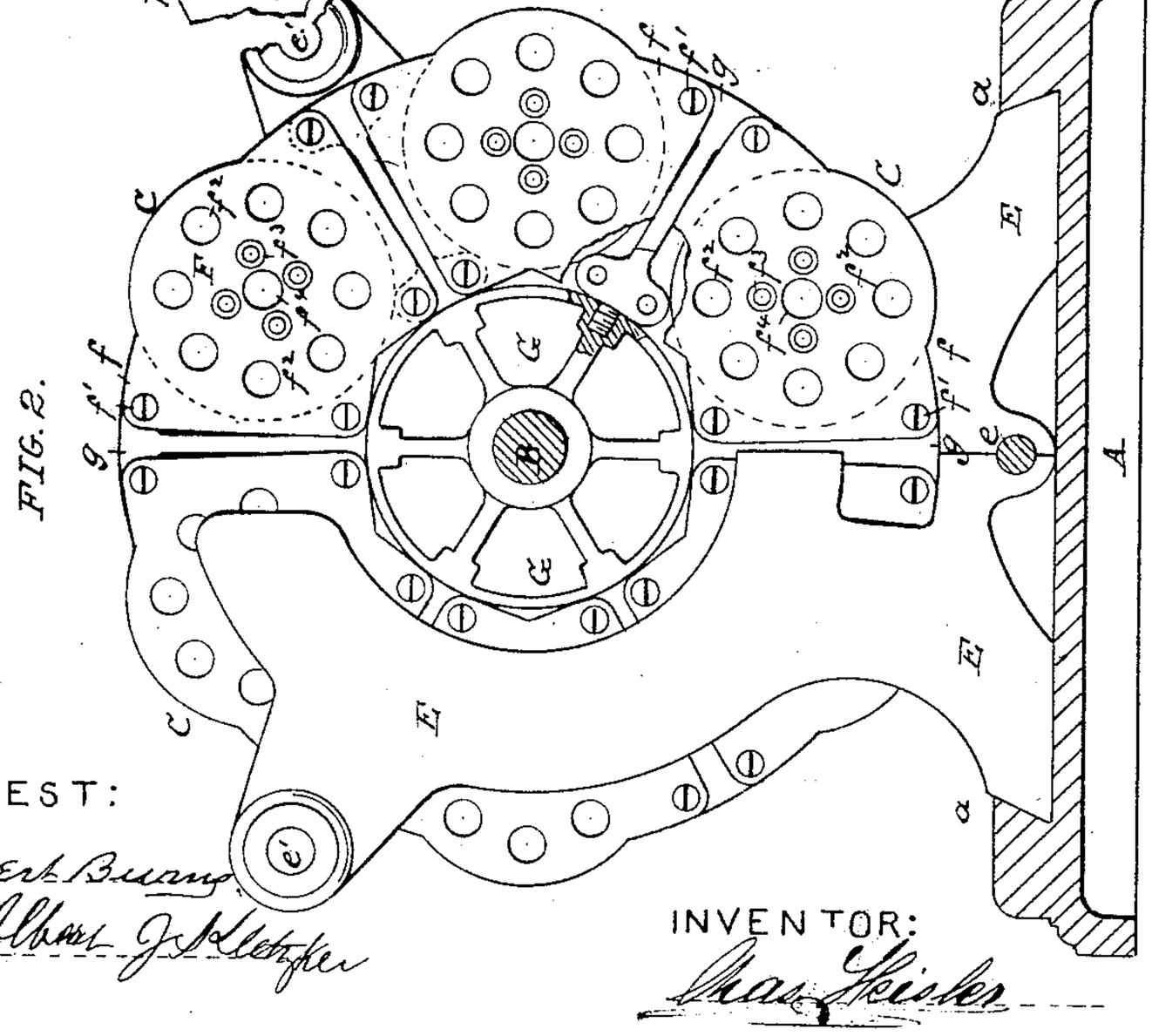


FIG. 2.



ATTEST:

Robert Burns

Albert J. Kleffer

INVENTOR:

Chas. Heisler

(No Model.)

3 Sheets—Sheet 3.

C. HEISLER.

MAGNETO ELECTRIC MACHINE.

No. 262,590. Patented Aug. 15, 1882.

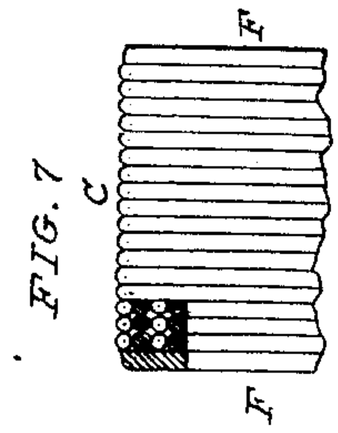


FIG. 7

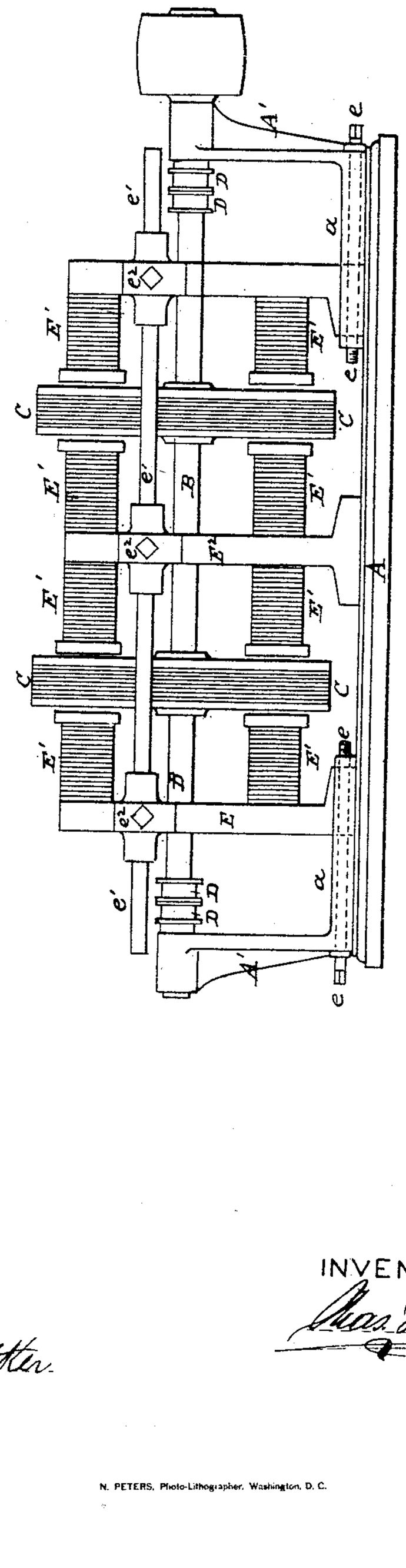


FIG. 11.

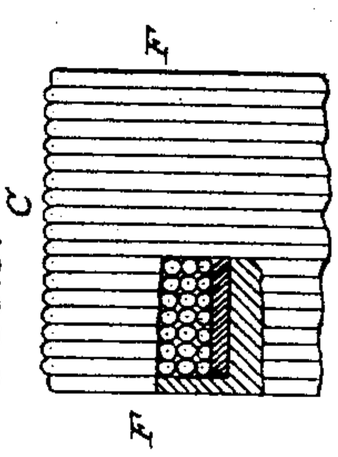


FIG. 9.

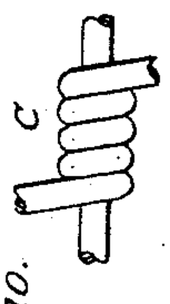


FIG. 10.

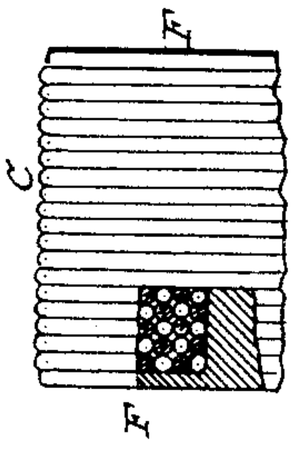


FIG. 6.

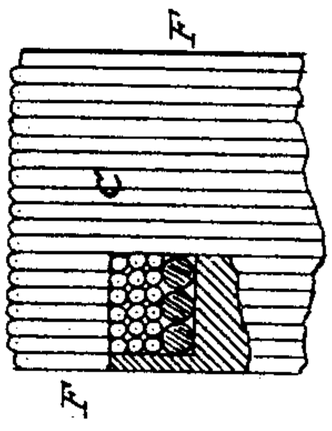


FIG. 8.

ATTEST:

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Albert J. Kleffner

INVENTOR:

Chas. Heisler

UNITED STATES PATENT OFFICE.

CHARLES HEISLER, OF ST. LOUIS, MISSOURI.

MAGNETO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 262,590, dated August 15, 1882.

Application filed November 19, 1880. (No model.)

To all whom it may concern:

Be it known that I, CHARLES HEISLER, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Magneto-Electric Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to certain improvements in magneto-electric machines, which are more especially adapted for electric-lighting purposes, the object being to equalize the power used to generate the electric current to the intensity of the electric current required, and also to prevent overheating of the armature spools or bobbins and render the same more effective; and this invention consists, first, in the provision of one or more corrugated sections, plates, or rings wound in between the layers of wire on the bobbin, so as to form ventilating-openings through the same, and when said sections, rings, &c., are made of iron they will form a part of the magnetic field in close proximity to the copper wires used for winding the spools; second, in an improved manner of securing the armature spools or bobbins to main frame or spider and rendering the removal of the same easy and convenient, as hereinafter more fully set forth; third, in the provision, in a magneto-electric machine, of the electro-magnets made adjustable to and from the rotating armature spools or bobbins, so as to regulate the strength of the current generated and the motive power required to generate the same; fourth, in a duplicate arrangement of electro-magnets and armature-spools upon a single shaft when the two central electro-magnets are secured to a central supporting-frame, as will hereinafter more fully appear.

In the accompanying drawings, in which similar letters of reference indicate like parts in the different figures, Figure 1 is a vertical longitudinal section illustrating my invention. Fig. 2 is a transverse section, one half at line *x x* and one half at line *x' x'*. Fig. 3 is a detail side view of one armature spool or bobbin and a portion of the spider or supporting frame. Fig. 4 is a detail axial section of the armature spool or bobbin. Fig. 5 is a detail top view of the same. Figs. 6, 7, 8, and 9 are detail views of armature-bobbins, partly in section, illustrating various modes of winding the armature spools or bobbins. Fig. 10 is a view of a compound iron and copper wire for winding armature-spools or bobbins. Fig. 11 is a side view of the machine, showing a duplicate arrangement of spools or bobbins upon a single driving-shaft. Fig. 12 is a detail transverse section, showing a modification of the mode of securing the armature-bobbins in the spider. Fig. 13 is a detail side view of the same.

A is the base of the machine, having standards or pillow-blocks A', in which turns the rotating shaft B, that carries the rotating armature spools or bobbins C.

D are collectors secured to said shaft in the usual manner, and having collecting-brushes, by means of which the electric currents are collected and transmitted.

E are the supporting-frames for the electro-magnets E'. These frames are arranged in slides *a* on the base A, and are preferably adjusted simultaneously by a right-and-left-handed screw, *e*. Any other suitable equivalent device may be used to effect the same result without departing from the spirit of my invention, which is broadly for making the electro-magnets adjustable to and from the armature-spools C. Where a duplicate arrangement of electro-magnets and armature-spools are arranged on a single shaft, then only the two outer sets of electro-magnets are made adjustable, as clearly indicated in Fig. 11. In this case the two central sets of electro-magnets will be attached to the stationary central supporting-frame, E^2, as shown in Fig. 11.

e' are rods passing through ears at the top or sides of the electro-magnet frame E E^2, and e^2 are set-screws bearing on said rods to tie the frames in proper position.

F are plates, between which the wire is coiled to form the armature-bobbin. These plates are provided with ears *f*, through which screws *f'* pass to secure the frame to the lugs *g* on the arms of the spider G, the lugs *g* being far enough apart to allow for the removal of the bobbins when required. As a modification of this arrangement, the spider G may be formed with cylindrical or other suitable shaped cham-

bers in which the bobbins are loosely placed, and held in position by covering-plates G′, as clearly indicated in Fig. 12.

In Figs. 8 and 9 I have shown my mode of winding the armature-bobbins C, so as to use a part of its capacity for exciting the magnetic field. In Fig. 8 is shown a layer of large wire wound on the bobbin, the current generated in this layer being used for exciting the field-magnets. In Fig. 9 is shown a plate of copper wound on the bobbin for effecting the same purpose.

In order to bring the magnetic field into close proximity to the different layers of wire on the armature-bobbins, I have arranged iron wire wound on the bobbins alternately, as shown in Fig. 6, or in alternate layers, as shown in Fig. 7.

Instead of wires used as above stated, sections, plates, or rings of iron may be wound in the bobbin to effect the same purpose; and, again, the bobbins may be wound with a compound wire composed of an iron wire wound with copper, or vice versa, as shown in Fig. 10. When sections, plates, or rings are used they will be of a corrugated form, as shown in Figs. 3 and 4, so as to provide ventilating-passage through the bobbins to keep the same cool, and the sides of the plates F F may be scored or grooved in a radial direction from the axis of the main shaft to further aid the ventilation and cooling of the bobbin.

In Figs. 3 and 4 I have shown only a single ring of corrugated metal interposed between the layers of wires on the bobbins; but it is evident that any required number may be used with supply and discharge openings f^2 through the holding plates or frames F.

It is preferable to form the core of the bobbin of two or more connecting-rods, f^3, so as to form a hollow center, into which air enters and discharges through central openings, f^4.

The arms of the spider G are made separate from the hub portion, and are screwed into the same, as shown, the purpose being to achieve a better and cheaper construction and allow of any required number of bobbins being used.

Having thus fully described my said invention, what I claim as new is—

1. The armature bobbin or spool of a magneto-electric machine having a corrugated section, plate, or ring of iron wound between the layers of copper wires composing the bobbins, so as to form ventilating-passages through the same and bring the magnetic field into close proximity to said wires, as described.

2. The combination, in the armature spool or bobbin of a magneto-electric machine, of the corrugated section, plate, or ring and bobbin plates or frame F, having openings f^2, as described, and for the purpose set forth.

3. The combination, in a magneto-electric machine, of the bobbin-spider and the removable bobbins having the plates F, substantially as described.

4. The combination, in a magneto-electric machine, of the shaft B, the four sets of magnets E′ E′ E′ E′, and the two sets C C of rotating armature-bobbins, the two outer sets of magnets being adjustable toward and from the armatures, and the two inner sets of magnets being stationary.

In testimony whereof I have hereunto set my hand this 16th day of November, 1880.

CHARLES HEISLER.

In presence of—

THEODORE PAPIN,

P. M. PAPIN.