

(No Model.)

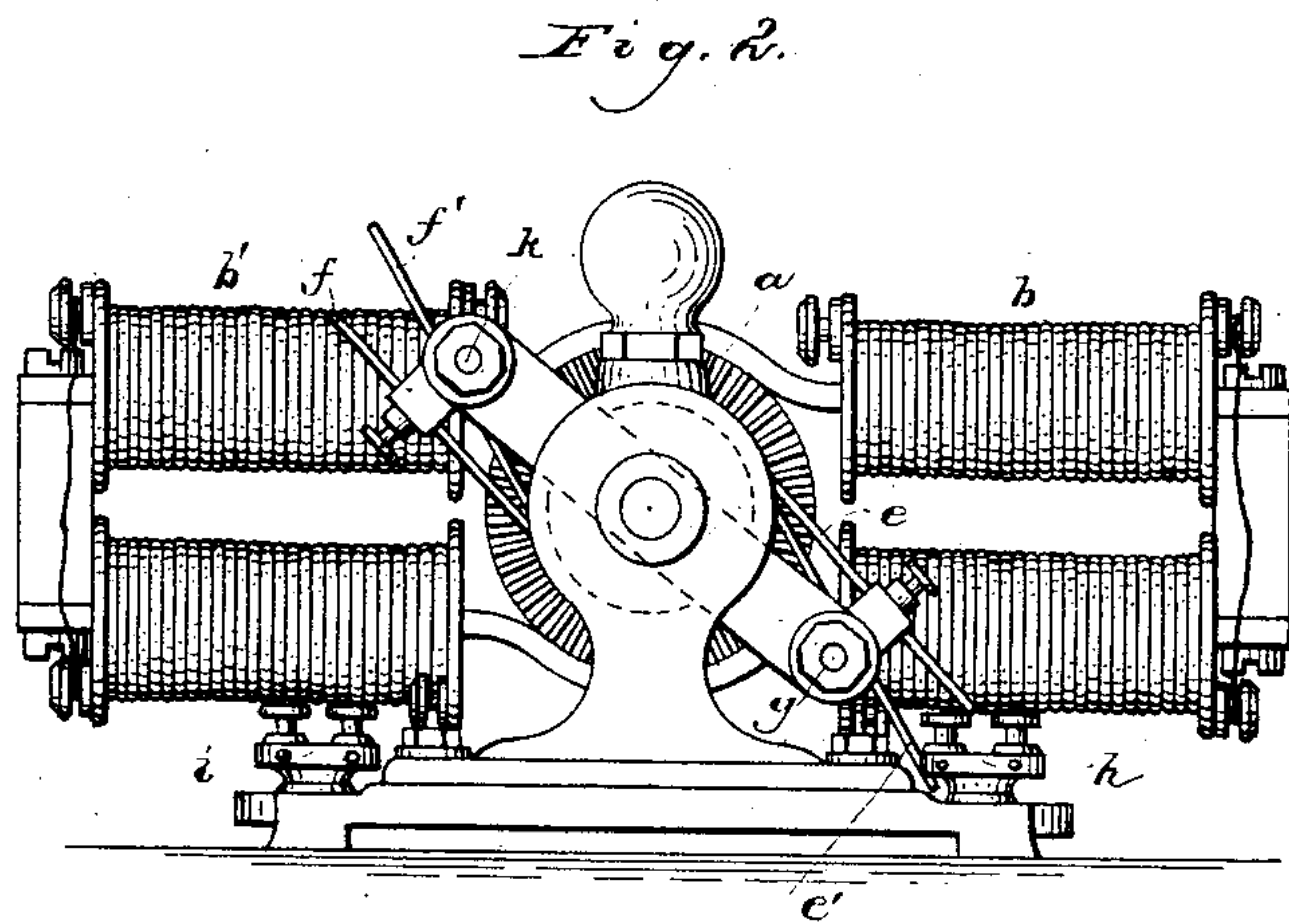
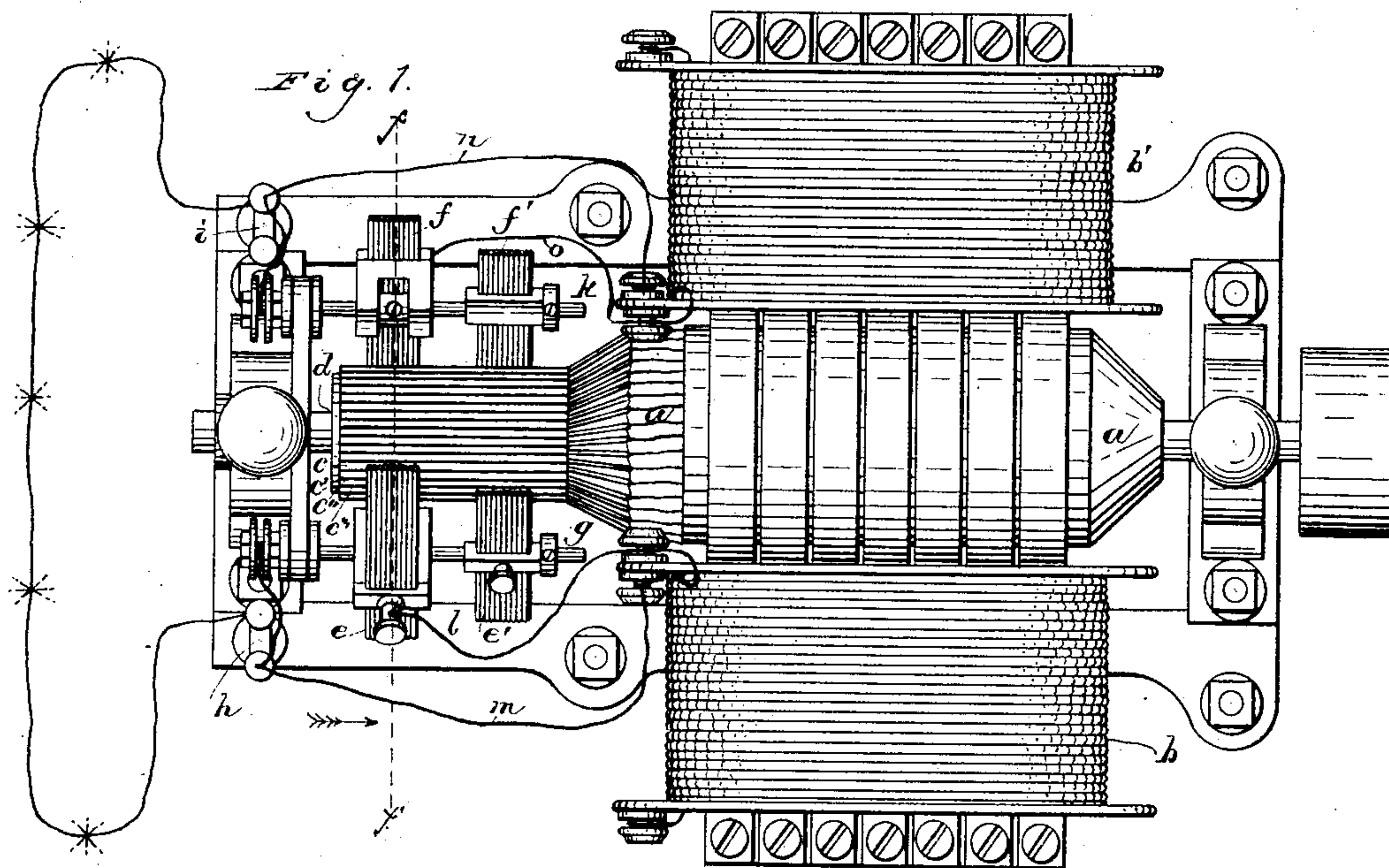
3 Sheets—Sheet 1.

C. E. SCRIBNER.

REGULATOR FOR DYNAMO ELECTRIC MACHINES.

No. 330,053.

Patented Nov. 10, 1885.



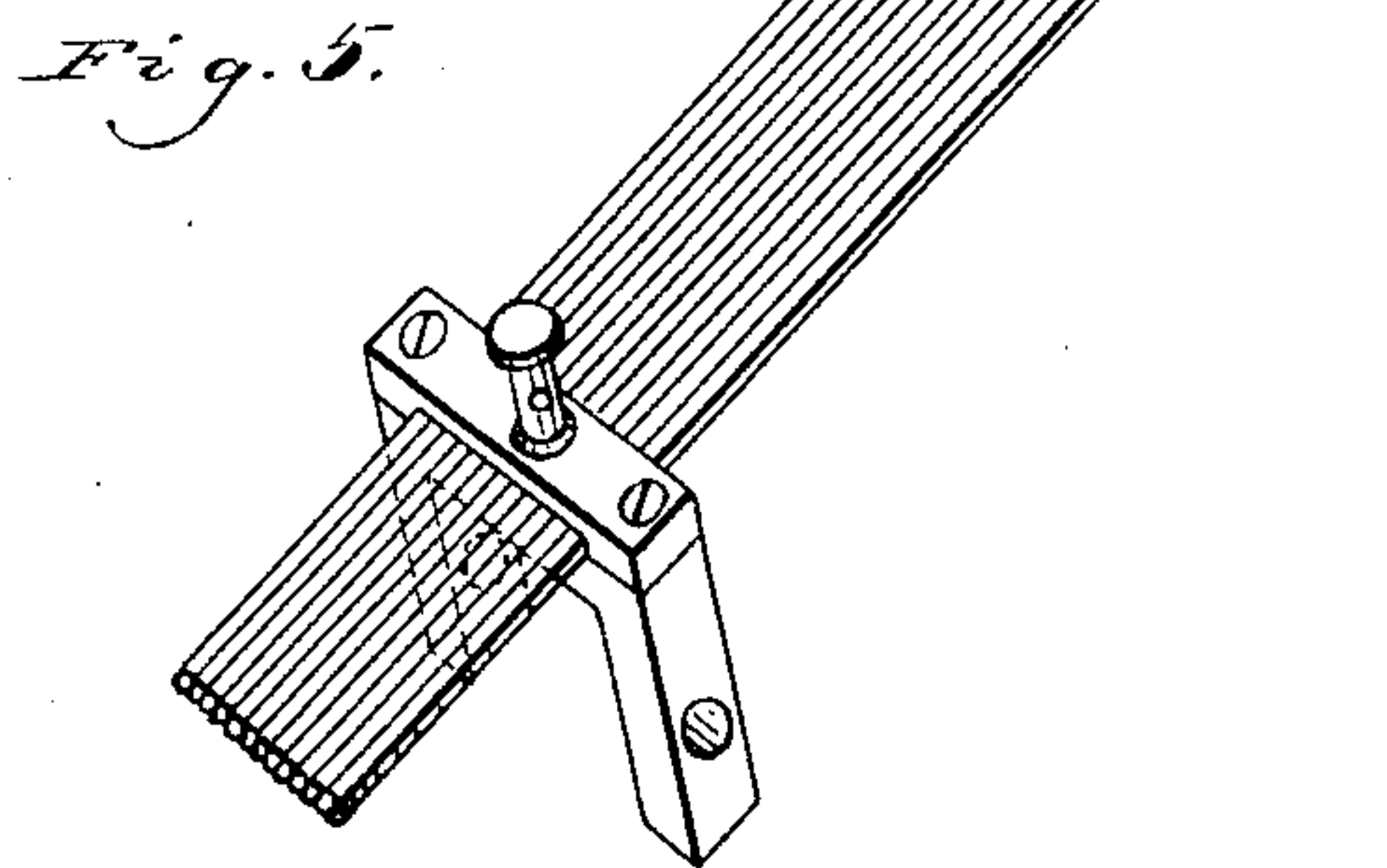
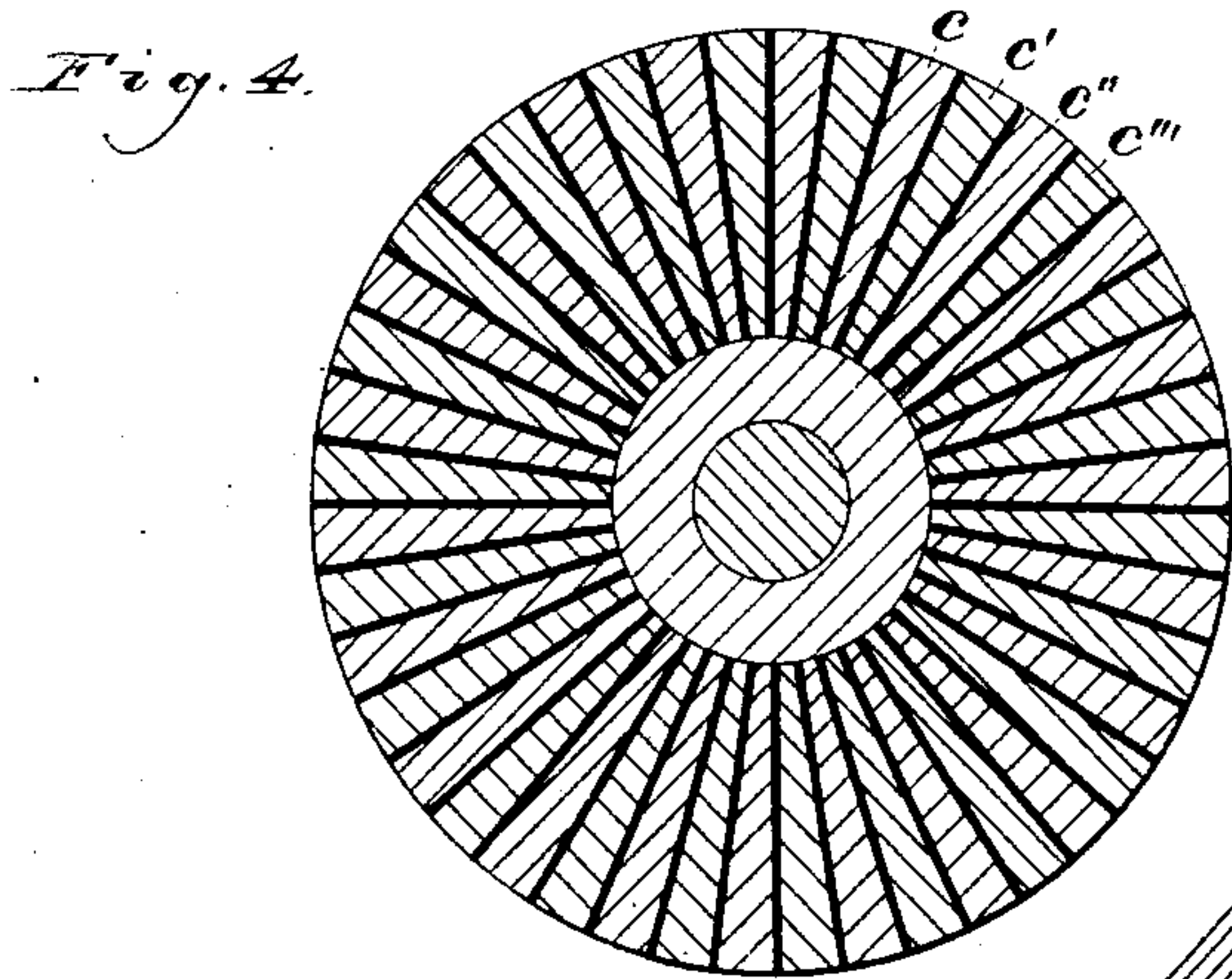
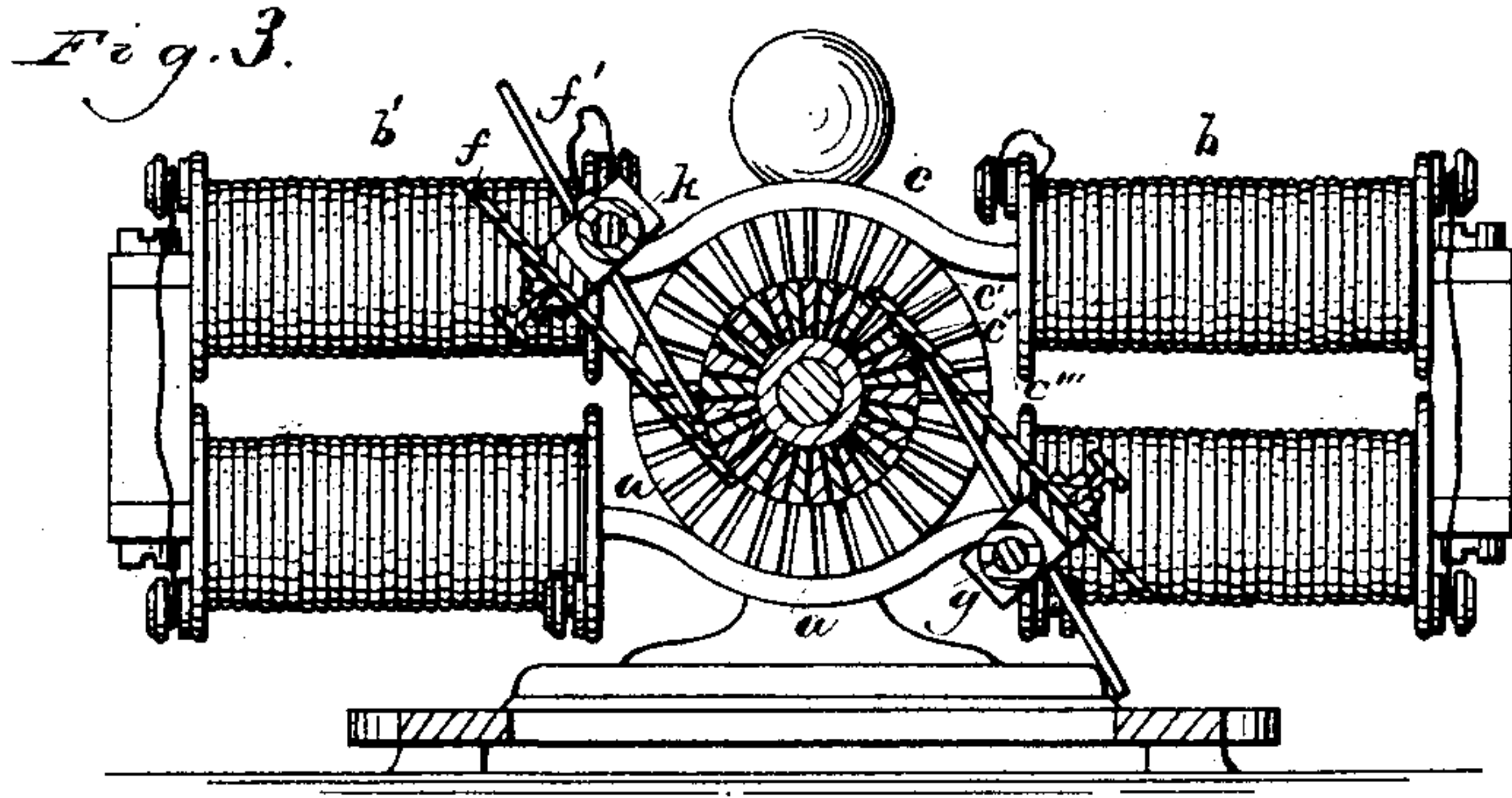
Witnesses.  
Henry Frankfurter  
per. J. A. Baker.

Inventor.  
Charles E. Scribner  
George H. Barton  
Attorney.

(No Model.)

3 Sheets—Sheet 2.

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3 Sheets—Sheet 3.

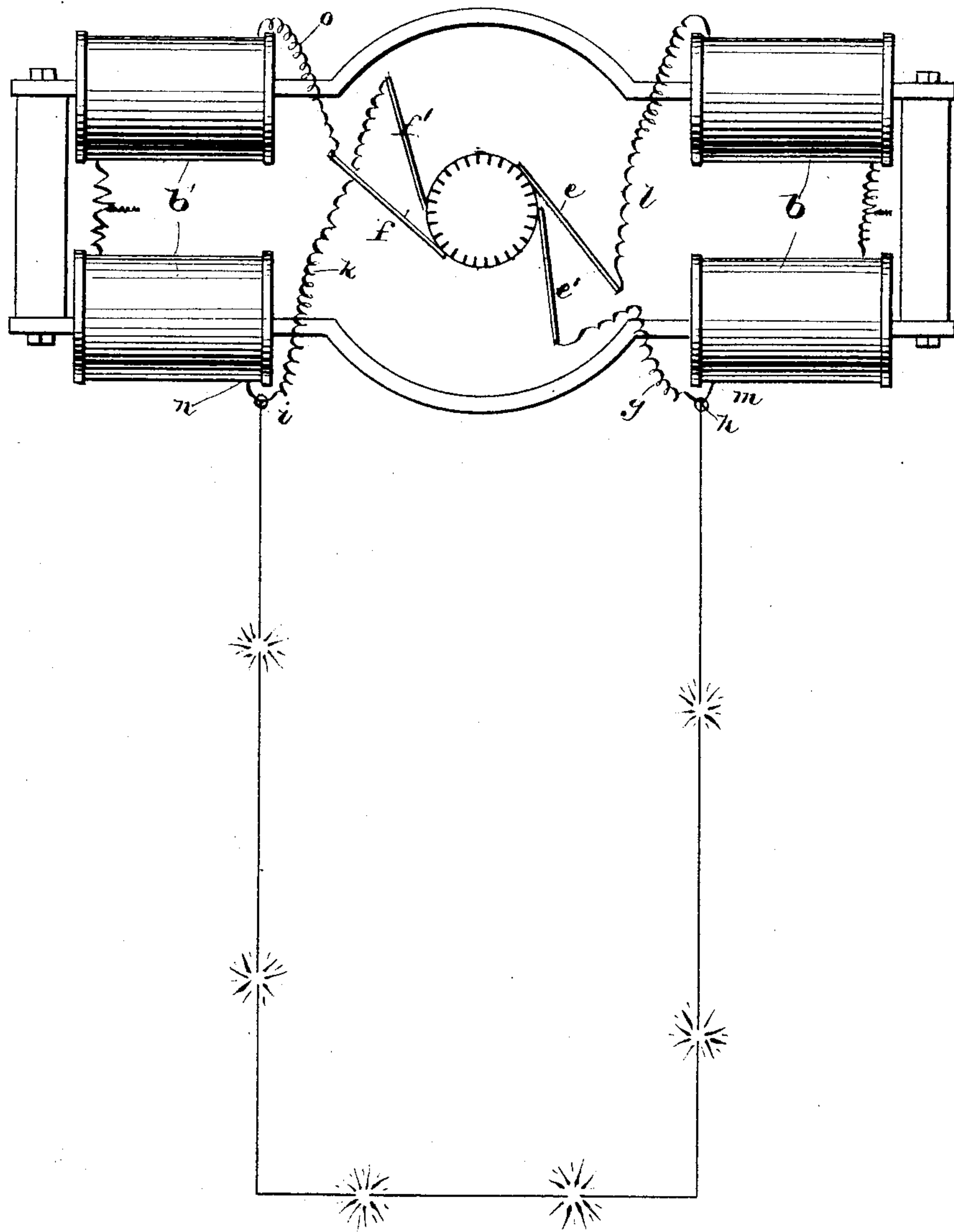
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Fig. 6



Attest

Paul A. Staley  
J. A. McKamy

Inventor

By Charles E. Scribner  
George P. Barton  
Attorney



# UNITED STATES PATENT OFFICE.

CHARLES E. SCRIBNER, OF CHICAGO, ILL., ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE WESTERN ELECTRIC COMPANY, OF SAME PLACE.

## REGULATOR FOR DYNAMO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 330,053, dated November 10, 1885.

Application filed June 2, 1882. Serial No. 63,044. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES E. SCRIBNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Dynamo - Electric Machines, (Case 42,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to that class of electric generators in which the armature is revolved in the magnetic field of electro-magnets charged by current from said armature; and it consists in the combination of the brushes with the commutator and the circuits, as hereinafter described, whereby the magnetic field is to a certain extent maintained independent of the exterior lamp-circuit.

In the drawings, Figure 1 is a plan view of a dynamo-electric machine embodying my improvement. Fig. 2 is a front elevation thereof. Fig. 3 is an elevation upon sectional line *x x* of Fig. 1. Fig. 4 is a detail view of the section of the commutator shown in Fig. 3. Fig. 5 is a detail view of one of the adjustable brushes and its brush-holder. Fig. 6 is a diagram view illustrative of the circuits.

Like parts are indicated by similar letters of reference in the different figures.

The armature *a* may be wound in any well-known way. It is placed in the field of electro-magnets *b b'*. The segments *c c' c'' c'''*, &c., of the commutator *d* are connected to the winding of the armature in the usual manner, and serve as contacts from which current is drawn off or collected by the brushes. The brushes *e e' f f'* are supported by independent brush-carriers. The carriers of brushes *e f* should be insulated from the rods *g k*, respectively. Each carrier may be at any angle upon its rod, and by loosening the thumb-screw the brush of any carrier may be moved to or from the commutator. The brushes are usually of flexible metal, like copper. Any two brushes therefore, as brushes *e e'*, may be so adjusted as to include as many segments *c c' c'' c'''*, &c., of the commutator *d* between their contacts as may be required to produce the desired strength of current through the field-magnet *b*. The current thus drawn off by

brushes *e e'*, it will be seen, is in a measure independent of the current which may be passing through the exterior lamp-circuit. I thus draw off current from the different sides of the armature to charge the field-magnets. The two sides of the armature are thus balanced, while current of any desired strength may be directed through the field-magnets, respectively.

When, as heretofore, only a portion of one side of the armature is shunted, the armature is thrown out of balance and destructive heat ensues, and consequently great loss of power. Where less electro-motive force than the whole force of the machine is required, I derive current from each of the two sides of the armature at the same time, and thus balance the armature and avoid destructive heat and consequent loss of power.

As shown in the drawings, the brushes *e' f'* bear, respectively, upon diametrically-opposite segments of the commutator. These segments are connected to that portion of the armature from which is derived the maximum current. The current from the commutator finds circuit to brush *e'*, thence to rod *g* and the binding-post *h*, and thence through the exterior lamp-circuit to binding-post *i*, rod *k*, and brush *f'*, and thence to the commutator.

The field-magnets *b* and *b'* are charged with current independent of the current passing through the lamp-circuit by shunting current from portions of the armature. The circuits are clearly shown in Figs. 1 and 6 of the drawings.

The current of field-magnet *b* is derived from that portion of the armature included between the contacts of brushes *e e'*, and in like manner field-magnet *b'* is charged by current accumulated by brushes *f f'* from that portion of the commutator included between the contacts of said brushes *f f'*. The strength of the currents thus shunted off may be varied by changing the position of the brushes so as to include a larger or smaller number of segments of the commutator.

The circuit through field-magnet *b* may be traced as follows: From the commutator to brush *e'* and rod *g* to binding-post *h*, thence by shunt-wire *m*, through coils of field-magnet *b* and brush *e*, to the commutator.

There is a difference of potential between the different portions of the revolving armature, and hence a difference in potential between the different segments of the commutator. The greatest difference will be between the segments diametrically opposite and connecting with the portions of the armature in the neutral points of the field.

A sufficient difference of potential exists between any two consecutive segments to produce a current. The brushes therefore may be so adjusted that any desired strength of current may be directed through the field-magnets. The field is thus charged and maintained by current derived directly from the armature and independent of the main circuit.

Prior to my invention current had been directed from the commutator and directed through electro-magnets for the purpose

of regulating automatically the collecting-brushes, as is shown in Patent No. 223,659, granted to Thomson & Houston, January 20, 1880. 20

I claim as new and original—

The combination, in a dynamo-electric machine, of the main electric circuit with shunt-circuits, each shunt-circuit including one of the field-magnets, and means whereby current may be diverted from the commutator and directed through the shunt-circuits, substantially as and for the purpose specified. 25 30

In witness whereof I hereunto subscribe my name.

CHARLES E. SCRIBNER.

Witnesses:

GEORGE P. BARTON,  
F. H. McCULLOCH.