

(No Model.)

2 Sheets—Sheet 1.

H. H. WAIT.
BRUSH FOR ARC DYNAMOS.

No. 563,337.

Patented July 7, 1896.

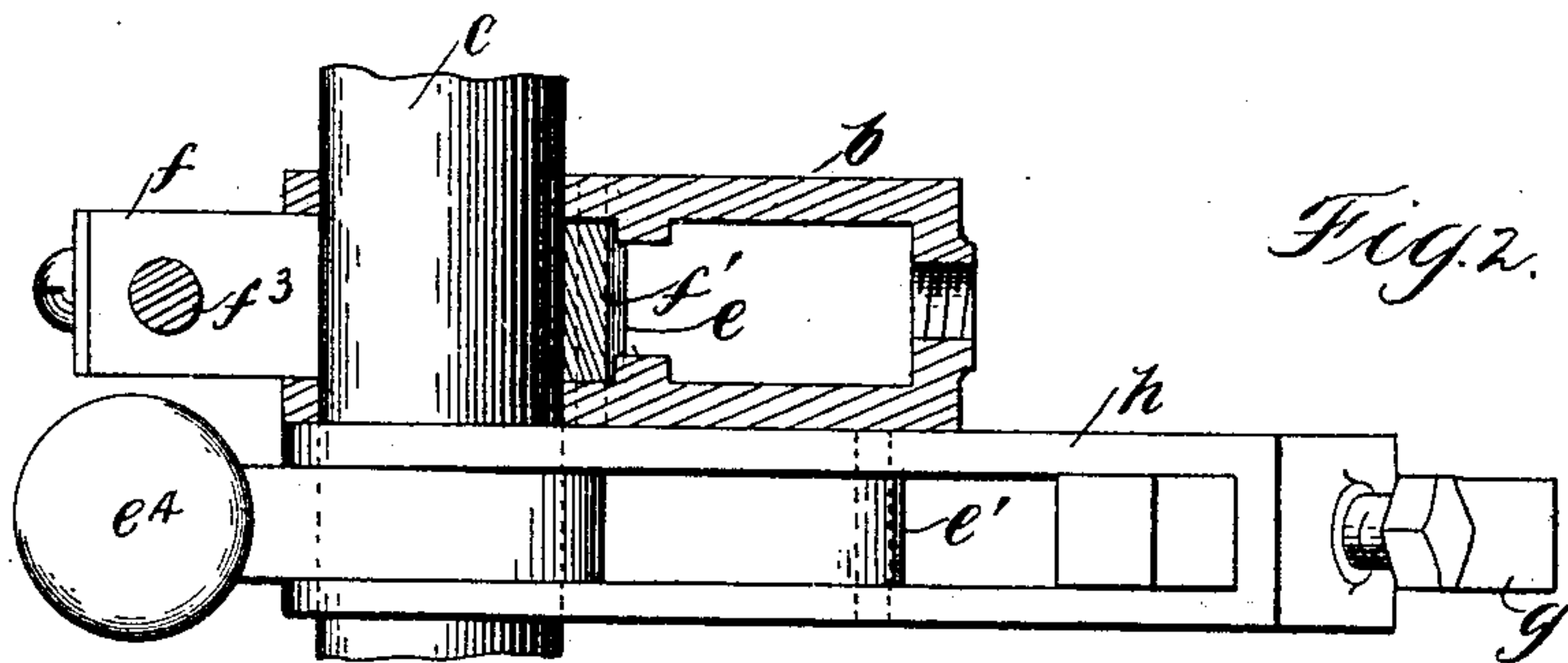
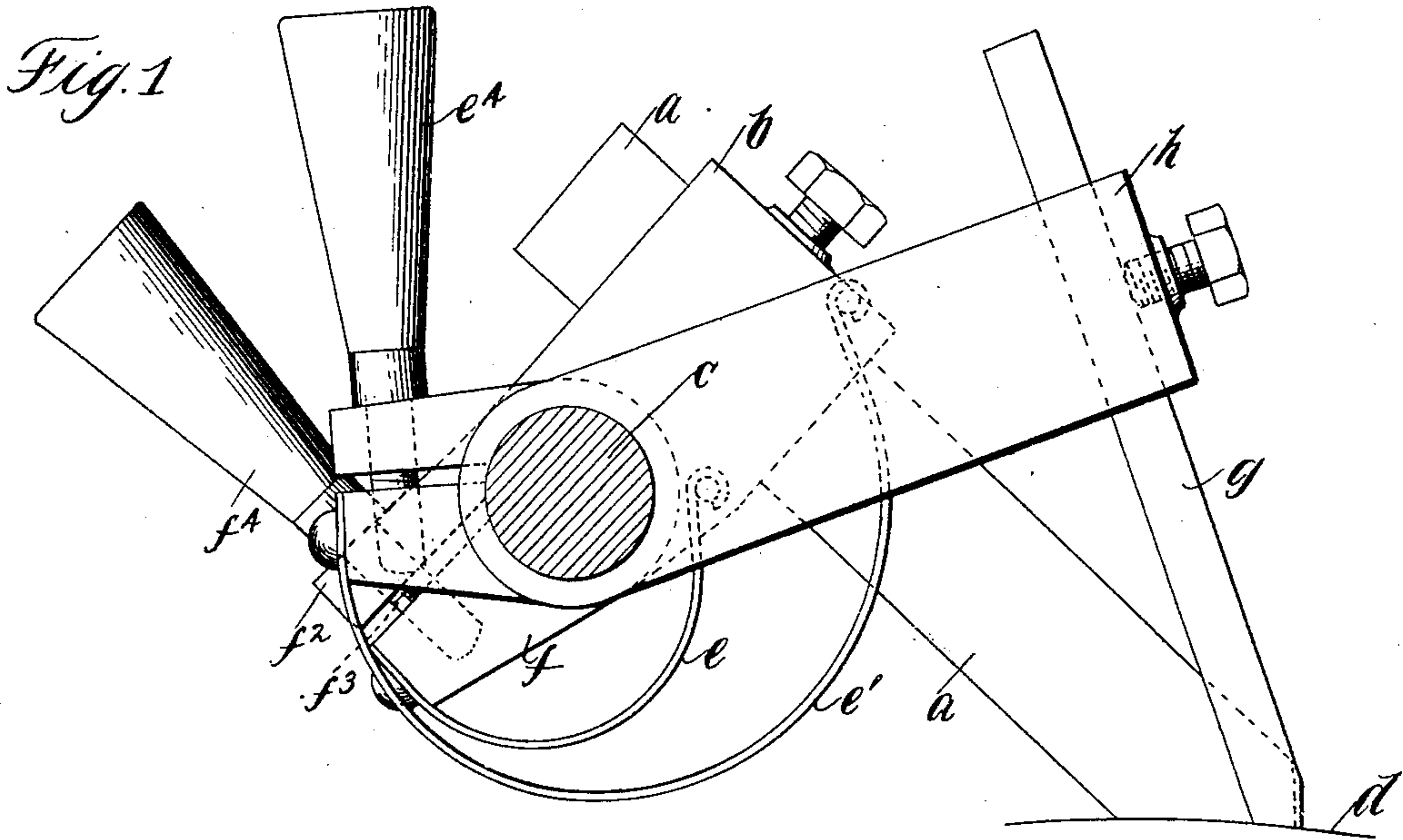
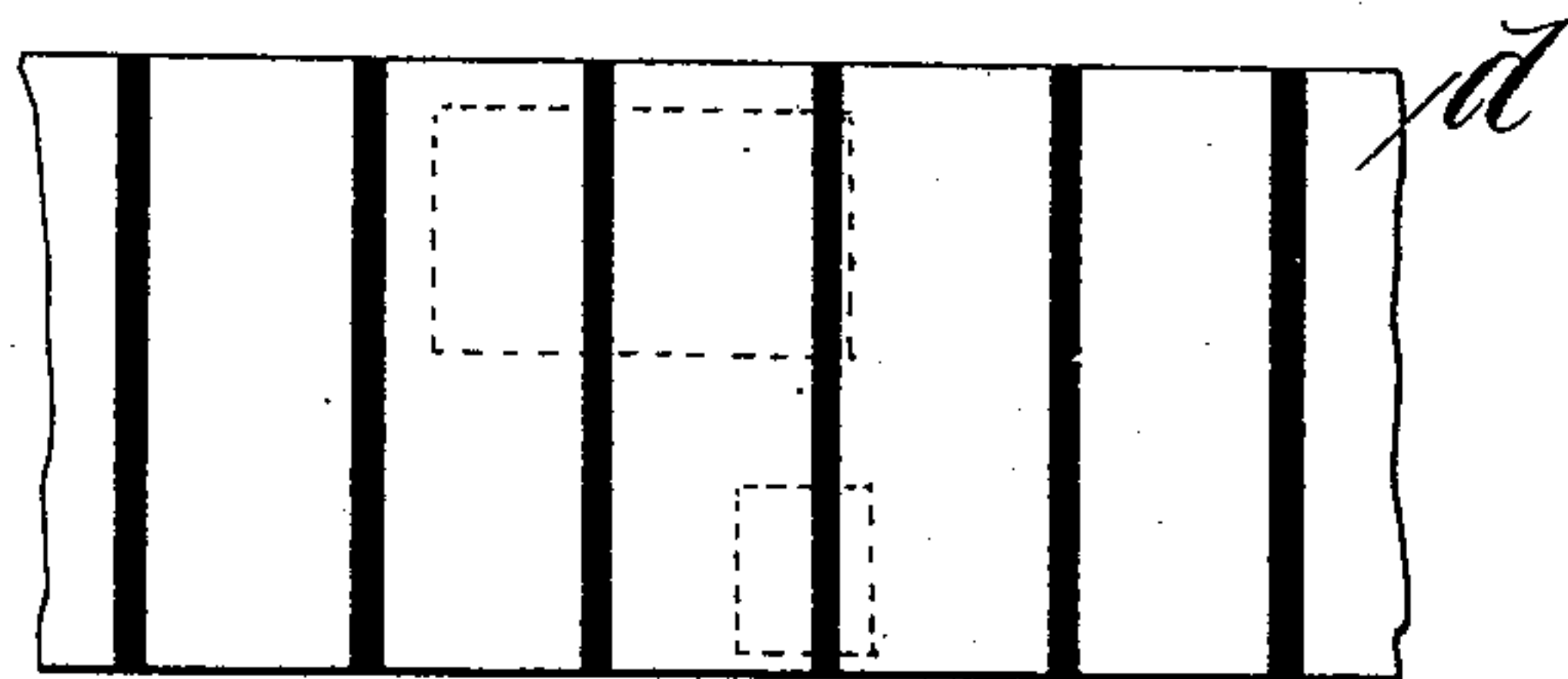


Fig. 3.



Witnesses:

George L. Cragg
W. Clyde Jones.

Inventor:

Henry H. Wait.
By Barton & Brown,
Attorneys

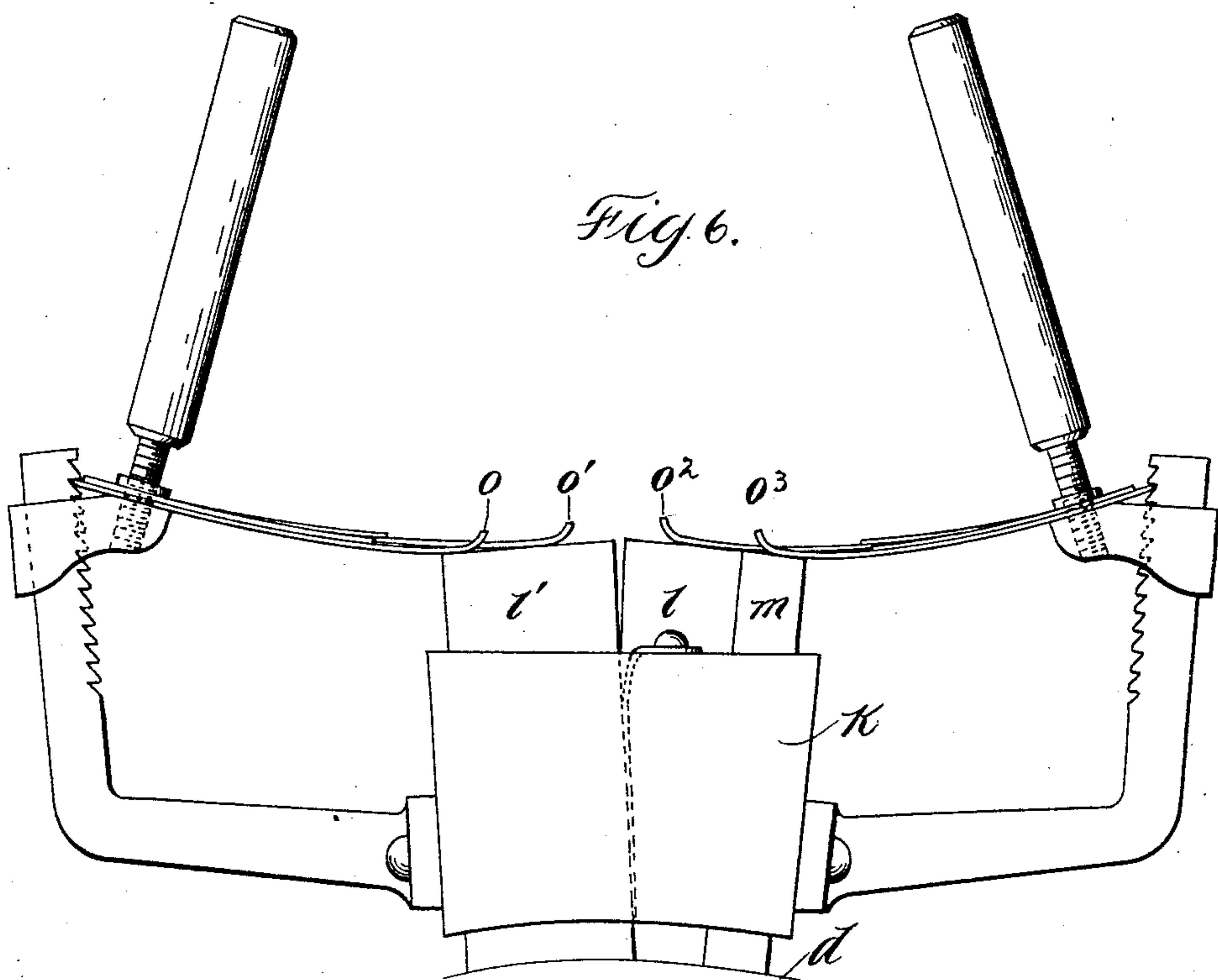
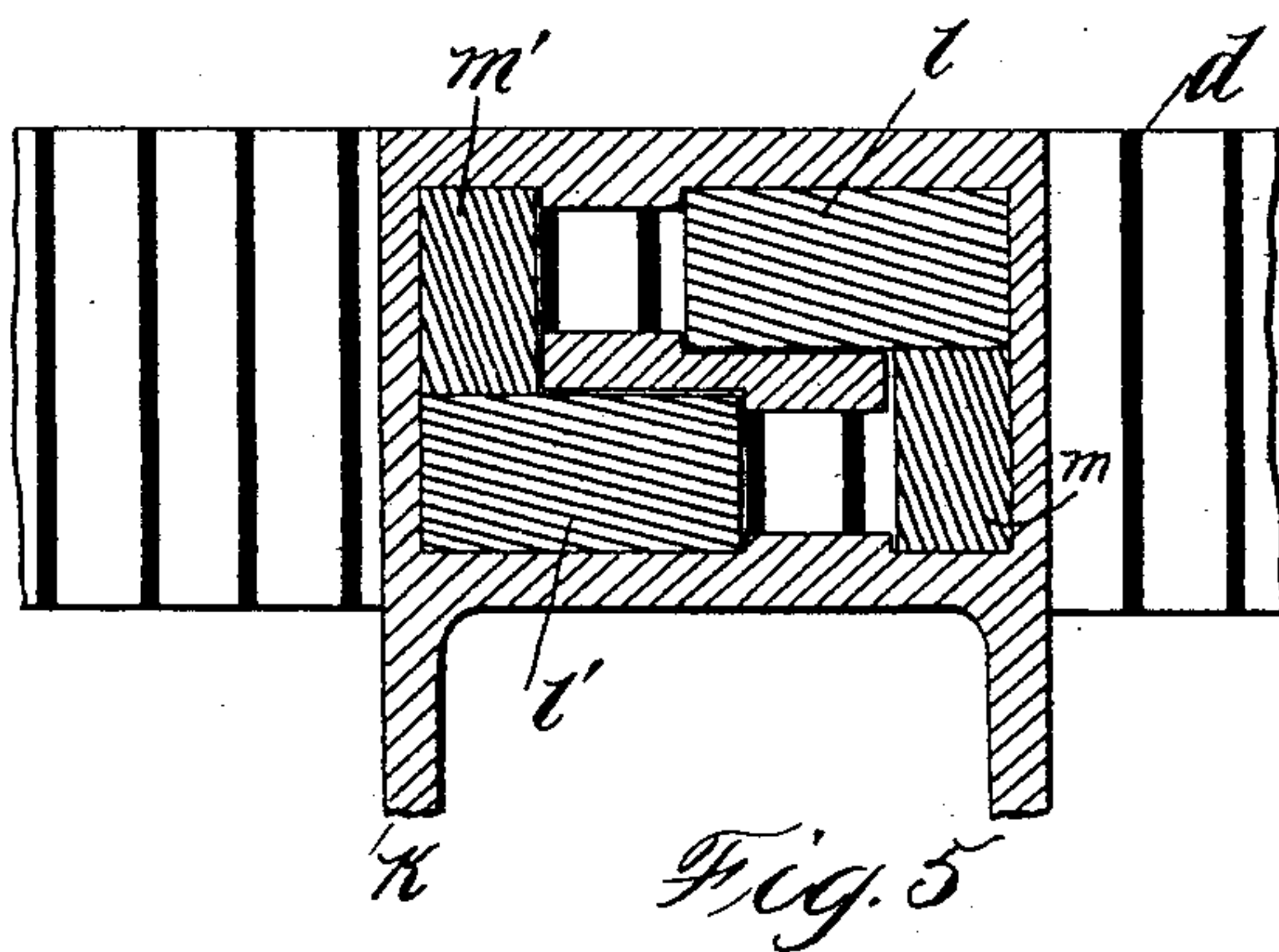
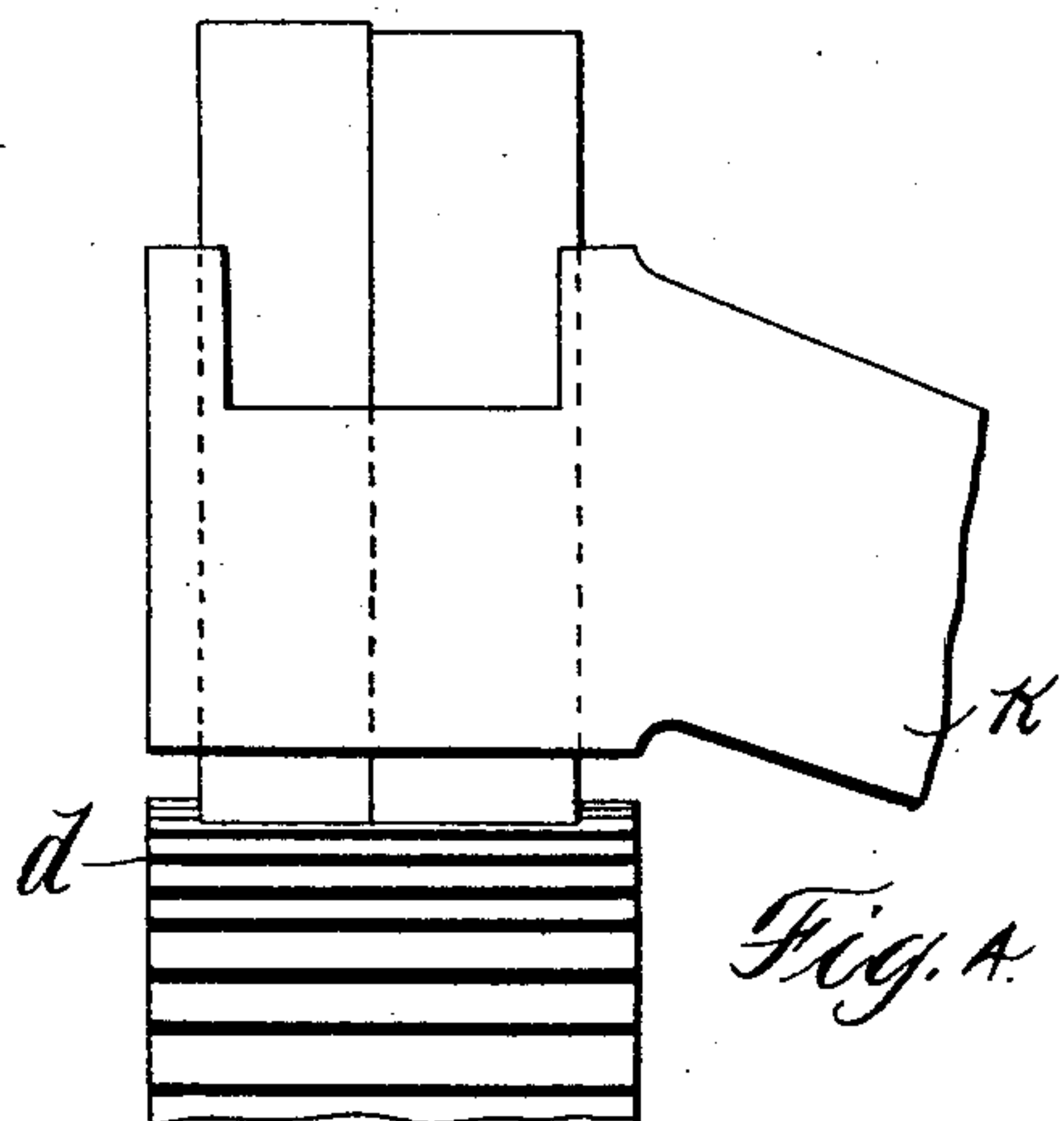
(No Model.)

2 Sheets—Sheet 2.

H. H. WAIT.
BRUSH FOR ARC DYNAMOS.

No. 563,337.

Patented July 7, 1896.



Witnesses:
George K. Cragg.
W. Clyde Jones.

Inventor:
Henry H. Wait.
By Boston Brown,
Attorneys.

UNITED STATES PATENT OFFICE.

HENRY H. WAIT, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN ELECTRIC COMPANY, OF SAME PLACE.

BRUSH FOR ARC-DYNAMOS.

SPECIFICATION forming part of Letters Patent No. 563,337, dated July 7, 1896.

Application filed August 20, 1895. Serial No. 559,925. (No model.)

To all whom it may concern:

Be it known that I, HENRY H. WAIT, 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 Brushes for Arc-Dynamos, (Case No. 3,) 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 a brush for arc-dynamos, its object being to construct a brush that shall localize arcing and prevent the travel of the arc across the contact-surface of the main portion of the brush.

In arc-dynamos it has been customary to employ compound brushes which are adapted to span several of the commutator-segments, the brush consisting of a tip and a heel with an open space between. When such compound brushes are employed, the number of commutator-segments is determined by the span or distance between the heel and tip of the compound brush, and as other characteristics of the machine often dictate a different number and arrangement of the commutator-segments it has been proposed to provide a brush which bears upon the commutator throughout the entire distance between the heel and tip portions of the compound brush. When such brushes are employed, sparking is produced at the tip, which gradually wears away the under surface of the brush until the wearing has gone completely across the under side of the brush, when the brush will drop down suddenly and start wearing away again in the same manner.

It is the object of the present invention to provide a brush in which the arc will be localized at the tip and the travel of the arc across the main portion of the brush prevented, the greater portion of the contact-surface of the brush being thus unimpaired by the arc and being worn away evenly by the friction of the brush upon the commutator, and in accordance with my invention I provide an auxiliary brush situated at the tip or leaving edge of the main brush, the auxiliary brush being independently fed down as it is worn away. The exact location of the auxiliary brush is not important provided it be situated at the tip or leaving edge of the

main brush. If the leaving edge of the auxiliary brush be situated considerably in advance of the leaving edge of the main brush, no arc appears upon the main brush under normal operation. When, however, an arc does appear upon the main brush, it does not travel farther back than the extreme rearward position of travel of the arc on the auxiliary brush. It is found in practice that the rear portion of the auxiliary brush wears away from friction as rapidly as the forward portion wears away, due to the arc, and, in consequence, the arc travels only about halfway across the contact-surface of the auxiliary brush, and the arc upon the main brush, when one is formed, travels back as far as the arc on the auxiliary brush.

I will describe my invention in connection with the accompanying drawings, in which—

Figure 1 is a view in elevation of a brush embodying my invention. Fig. 2 is a plan view thereof, partially in section. Fig. 3 is a view of a commutator, the positions of the main and auxiliary brushes being indicated by dotted lines. Fig. 4 is an end view of the brush which I preferably employ in practice. Fig. 5 is a transverse sectional view thereof. Fig. 6 is a view in elevation showing the means for automatically feeding the carbons forward.

As illustrated in Figs. 1 and 2, carbon brush *a* is mounted in a holder or carrier *b*, which is supported upon a rod *c*. The brush is pressed against the surface of the commutator *d* by means of a spring *e*, secured at one end to the end of the brush-carrier *b* and at the other end to an arm *f*, carried upon a collar *f'*, which surrounds rod *c*, collar *f'* also carrying an arm *f''*, through which passes a screw *f'''*, carried upon the end of a handle *f⁴*, the screw being adapted to engage a tapped hole provided in the arm *f*. By means of the handle *f⁴* the screw *f'''* may be turned to loosen the collar *f'*, whereby it may be rotated upon the rod *c* to adjust the tension of the spring *e*, after which the collar may be clamped in its adjusted position, by the rotation of the handle in the opposite direction. The auxiliary brush *g* is likewise mounted on a carrier *h*, supported upon the rod *c* and provided with a spring *e'* and handle *e⁴*, whereby the tension of the spring may be varied. The

auxiliary brush *g* rests upon the commutator near the tip or leaving edge of the main brush *a*.

In Figs. 4, 5, and 6 I have illustrated the form of brush which I preferably employ in practice. The brush comprises a shell or holder *k*, within which are situated four carbon brushes *l l' m m'*, the ends of the brushes resting against the commutator, against which they are firmly pressed by means of the springs *o o' o² o³*, one spring resting upon the upper end of each of the brushes. The brushes or carbons *l l'* constitute the main brush and extend in the direction of the rotation throughout the length of the arc of commutation. The brushes or carbons *m m'* constitute the auxiliary brushes and are adapted to take up the wear due to the arcs. The brush as thus constructed, with two auxiliary brushes *m m'*, is adapted for a machine in which the direction of the rotation of the armature may be reversed. In a machine in which the direction of rotation is constant but one of the auxiliary brushes need be employed.

It will be noted that carbons *l l'* overlap in a longitudinal direction, while carbons *m m'* overlap in a transverse direction. By this arrangement of overlapping brushes the wearing of ridges upon the commutator is avoided.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a main brush, of an independently-fed auxiliary brush situated at the tip or leaving edge of the main brush, substantially as and for the purpose set forth.

2. In a compound brush, the combination with a member or members making continuous contact with the commutator from the tip to the heel of the brush, of an individually-fed portion situated at the tip or leaving edge of the brush, substantially as and for the purpose set forth.

3. In a compound brush, the combination with members overlapping in a longitudinal direction and making continuous contact with the commutator from the tip to the heel of the brush, of members overlapping in a transverse direction, whereby the uneven wearing away of the commutator is prevented, substantially as described.

In witness whereof I hereunto subscribe my name this 29th day of July, A. D. 1895.

HENRY H. WAIT.

Witnesses:

JOHN W. SINCLAIR,
W. CLYDE JONES.