

(No Model.)

A. J. CHURCHWARD.

CARBON BRUSH HOLDER FOR DYNAMO ELECTRIC MACHINES.

No. 544,844.

Patented Aug. 20, 1895.

Fig. 3.

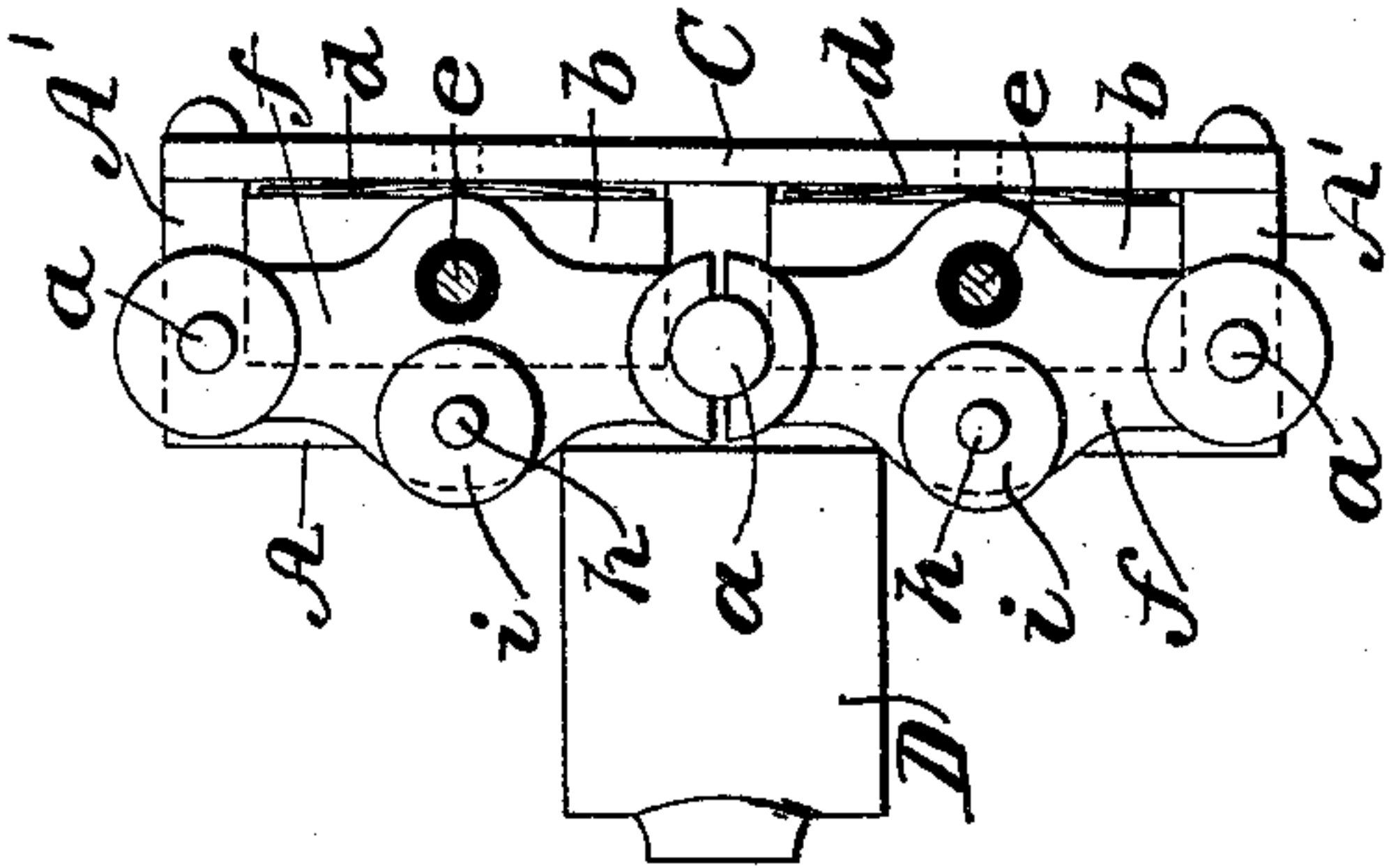


Fig. 1.

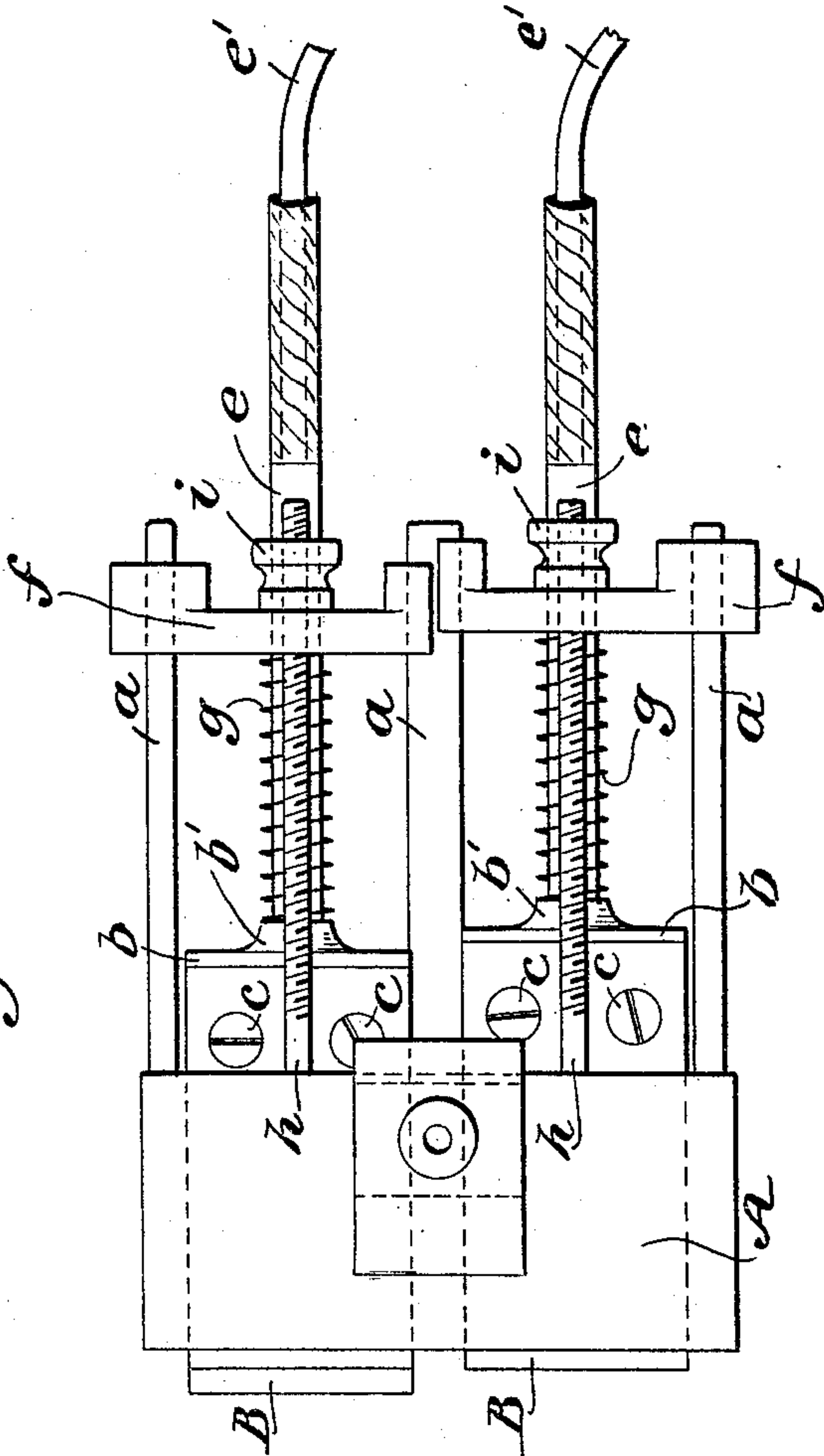
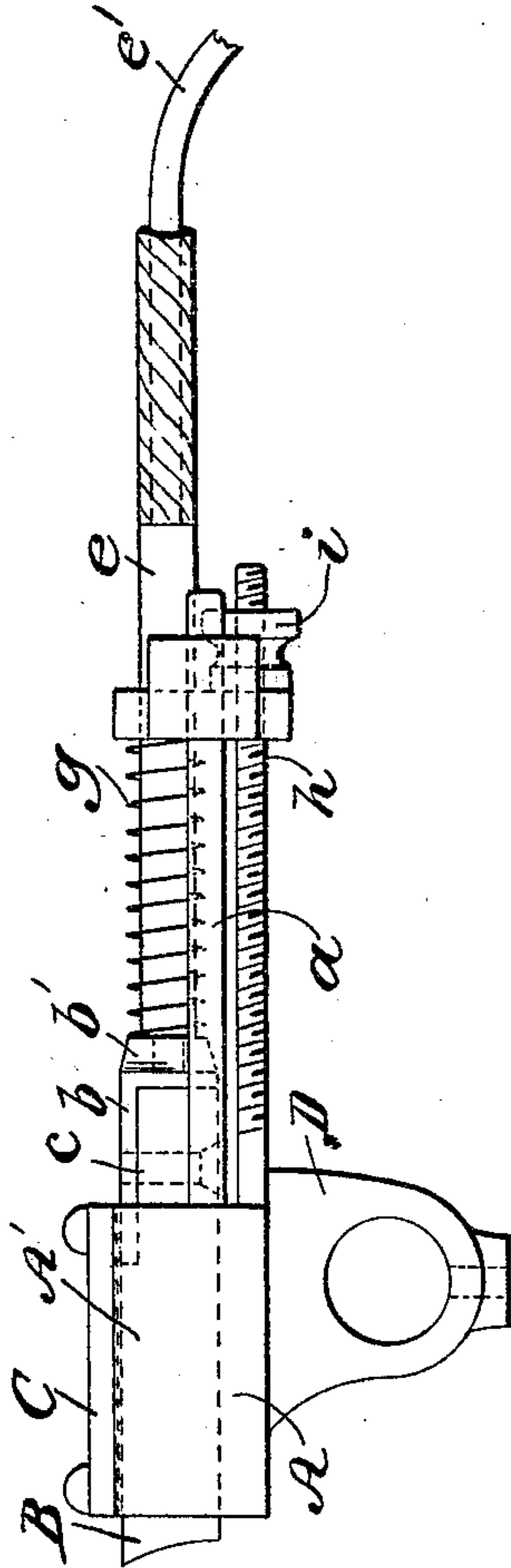


Fig. 2.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

ALEXANDER JAMES CHURCHWARD, OF BROOKLYN, NEW YORK.

## CARBON-BRUSH HOLDER FOR DYNAMO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 544,844, dated August 20, 1895.

Application filed May 14, 1894. Serial No. 511,134. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXANDER JAMES CHURCHWARD, a subject of the Queen of Great Britain, and a resident of Brooklyn, in the county of Kings, State of New York, have invented certain new and useful Improvements in Carbon-Brush Holders for Dynamo-Electric Machines, of which the following is a specification.

10 This invention relates to holders for the carbon brushes of dynamo-electric machines, and has for its object to provide a simple, cheap, readily-constructed, and perfectly-operating device of this character which shall be constantly and automatically held in contact with the commutator, and at the same time be capable of adjustment to bear upon the same with a greater or less degree of tension, as desired.

20 Heretofore carbon brushes have been applicable only to small dynamo-electric machines, or to machines of low current capacity, the obstacle to their adoption for use in connection with even moderately-large currents having been the considerable heat evolved by friction and poor contact. By the use of my invention, however, the brush is given only sufficient pressure to cause the same to bear against the commutator, and the pressure provided being yielding or elastic and directly applied reduces the heat and loss by friction to a minimum.

35 A further object of my invention is to provide improved means for carrying off the current from the brush without loss by heat.

The invention consists in the novel construction and arrangement of parts hereinafter fully described.

40 In the accompanying drawings, forming part of this specification, in which like letters of reference designate corresponding parts throughout, Figure 1 is an inverted plan view of a pair of brush-holders embodying my invention. Fig. 2 is a side elevation of the holders. Fig. 3 is a rear elevation of the same.

45 In the practice of my invention I construct a plate or frame A substantially oblong in contour, having at each end thereof and at the center upwardly-projecting ribs or shoulders A'. At the inner side of the frame are secured, or are formed integrally with the said ribs, guide-rods *a* of any desired length, the

central rod being thicker or of a greater diameter than the outer rods.

55 In each of the two spaces or depressions into which the frame A is divided by the ribs A' rest the carbon brushes B, which have secured at the rearward end thereof the angular or substantially L-shaped plates *b*, secured to the said brushes by means of bolts *c*, 60 passing through the same and into the plate. Upon the top of the ribs or shoulders A' is secured a plate C, having on the under side thereof two steel or other plate springs *d*, which bear upon the tops of the brushes B 65 and serve to hold the same normally downward, while permitting slight vertical play thereof.

Each of the angular plates *b* has at the rear thereof circular shoulders *b'*, centrally apertured and interiorly screw-threaded. In these shoulders are screwed the rigid conducting-rods *e*, which said rods are connected to a flexible cable *e'* and pass through followers *f*, which are movable upon the guide-rods *a*, the 75 said followers surrounding the outer rods *a* and clasping about half-way round the central rod which forms a common guideway for each of the said followers.

Intervening each of the circular shoulders *b'* and the followers *f* the conducting-rod *e* 80 has surrounding the same a spiral spring *g*, which may, if desired, be secured to either or both the said shoulder and follower, though such is not essential. 85

Immediately below the brushes the frame or lower plate A has secured thereto the screw-threaded rods *h*, which pass through the center of the followers *f* and have upon the ends thereof, behind the said followers, thumb-nuts *i*, which as they are screwed up carry with them the said followers and increase the tension of the springs *g*. The said frame *b* also has depending therefrom the loop or tongue D, by means of which it is secured to 95 the pin of the dynamo.

The operation of the device will be very readily understood from the foregoing description, taken in connection with the accompanying drawings. The device having 100 first been secured in place, the springs *g* cause the brushes B to bear against the commutator, and the springs *d* upon the underside of the plate C serve to render the said brushes



slightly yielding vertically. The current is then carried off through the plates *b* and the conductors *e*. When the springs have become weakened from wear, or should it be desired for any other reason to reinforce or strengthen the said springs, the thumb-nuts *i* are screwed up, thereby carrying the followers *f* farther forward, increasing the tension of the springs *g* and causing the brushes to bear more heavily.

I have illustrated my improved brush-holder as applied to a pair of brushes, such being the usual number employed; and my invention is particularly designed for use in connection with two or more brushes, as the same, by reason of the separate springs and followers, may be held against the commutator independently of each other and with different degrees of tension, if desired, this independent adjustment of the brushes being an advantage, since the said brushes will rarely wear evenly. It will be obvious, however, that the invention is applicable to single brushes as well should such be used, and I therefore do not confine myself in this particular.

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

1. A brush holder for dynamo-electric machines, comprising a frame in which the brushes are held, having guide-rods at the rear thereof, angular plates secured to each of the said brushes by screws passing there-through, a conducting rod detachably secured to the said plate, a spring surrounding the same, a follower working upon the guide-rods, means for adjusting the brushes independently, and a conductor connected to the conducting rod, substantially as shown and described.

2. A brush holder for dynamo-electric machines comprising a frame adapted to receive a plurality of brushes therein, plates attached to each of the brushes, conducting rods secured to the said plates, springs surrounding the said conductors, means for adjusting the tension of each of the springs independently of the others, and a conductor connecting with the conductor rod, substantially as shown and described.

3. A brush holder for dynamo-electric machines, comprising a frame adapted to receive a plurality of brushes therein, plates attached to each of the brushes, conducting rods detachably secured to each of the plates, springs surrounding the conductor rods, guide-rods projecting from the holder, followers sliding thereon rearward of the springs, means for adjusting the tension of each spring independently of the others, whereby the brushes may have varying strengths of contact, and a conductor connecting with the conductor rod, substantially as shown and described.

4. A brush holder for dynamo-electric machines, comprising a frame in which the brushes are held, angular plates secured to the said brushes by screws or bolts, conducting rods secured to the said plates in such manner as to be detachable therefrom, springs surrounding the rods, and a conductor connecting with the said conductor rod, substantially as shown and described.

5. A brush holder for dynamo-electric machines, comprising a frame divided by ribs for the reception of a plurality of brushes, guide-rods extending rearwardly therefrom, screw-threaded rods also extending rearwardly therefrom, plates attached to the brushes, conductor rods detachably secured thereto, springs surrounding the said conductor rods, followers thereon working on the guide-rods, nuts upon the screw-threaded rods to adjust the tension of the springs, and a conductor connecting with the conductor rods, substantially as shown and described.

6. A brush holder for dynamo-electric machines, comprising a frame divided by ribs for the reception of two brushes, guide-rods ranging rearwardly from the said frame, an angular plate secured to each of the brushes at the rear and having an apertured shoulder thereon, a rigid conducting rod secured in the said shoulder, having a flexible cable attached thereto, a follower through which the said conductor passes, working upon the guide-rods and on a screw-threaded rod, a spring surrounding the conductor, and a thumb-nut upon the screw-threaded rod adapted to adjust the follower, substantially as shown and described.

7. A brush holder for dynamo-electric machines, comprising a frame divided by ribs for the reception of two or more brushes, a plate upon the top of the said frame having springs thereon bearing upon the brushes, guide-rods ranging rearwardly from the said frame, an angular plate secured to each of the brushes and having an apertured screw-threaded shoulder at the rear thereof, a rigid conducting rod secured in the said aperture having a flexible cable attached thereto and passing through a follower, the said follower working upon the guide-rods and upon a screw-threaded rod secured to the frame, a spiral spring surrounding the conductor between the brush-plate and the follower, and a thumb-nut upon the screw-threaded rod adapted to adjust the said follower, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 30th day of April, 1894.

ALEX. JAMES CHURCHWARD.

Witnesses:

E. GOSLIN,

F. C. NIBLO.