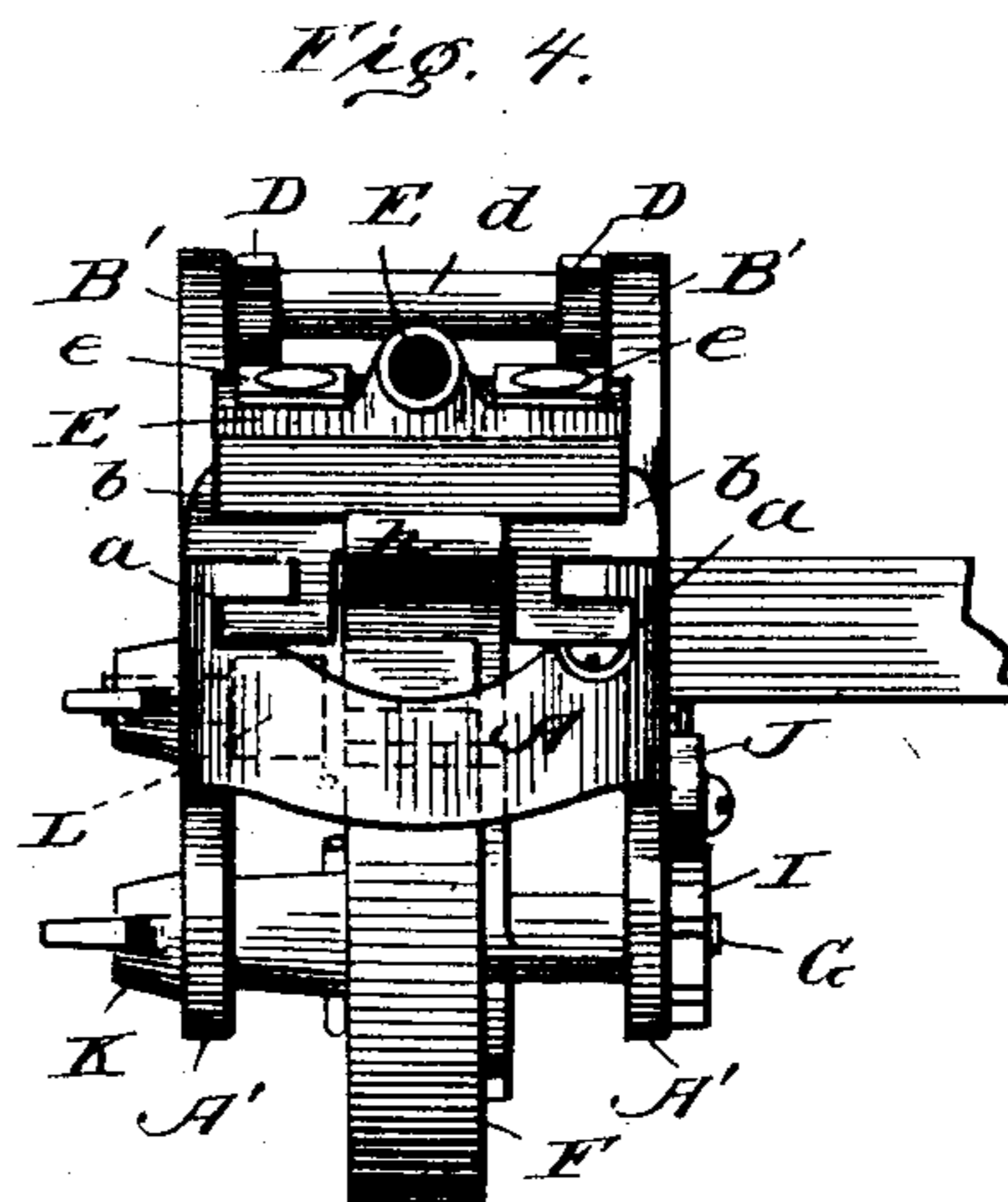
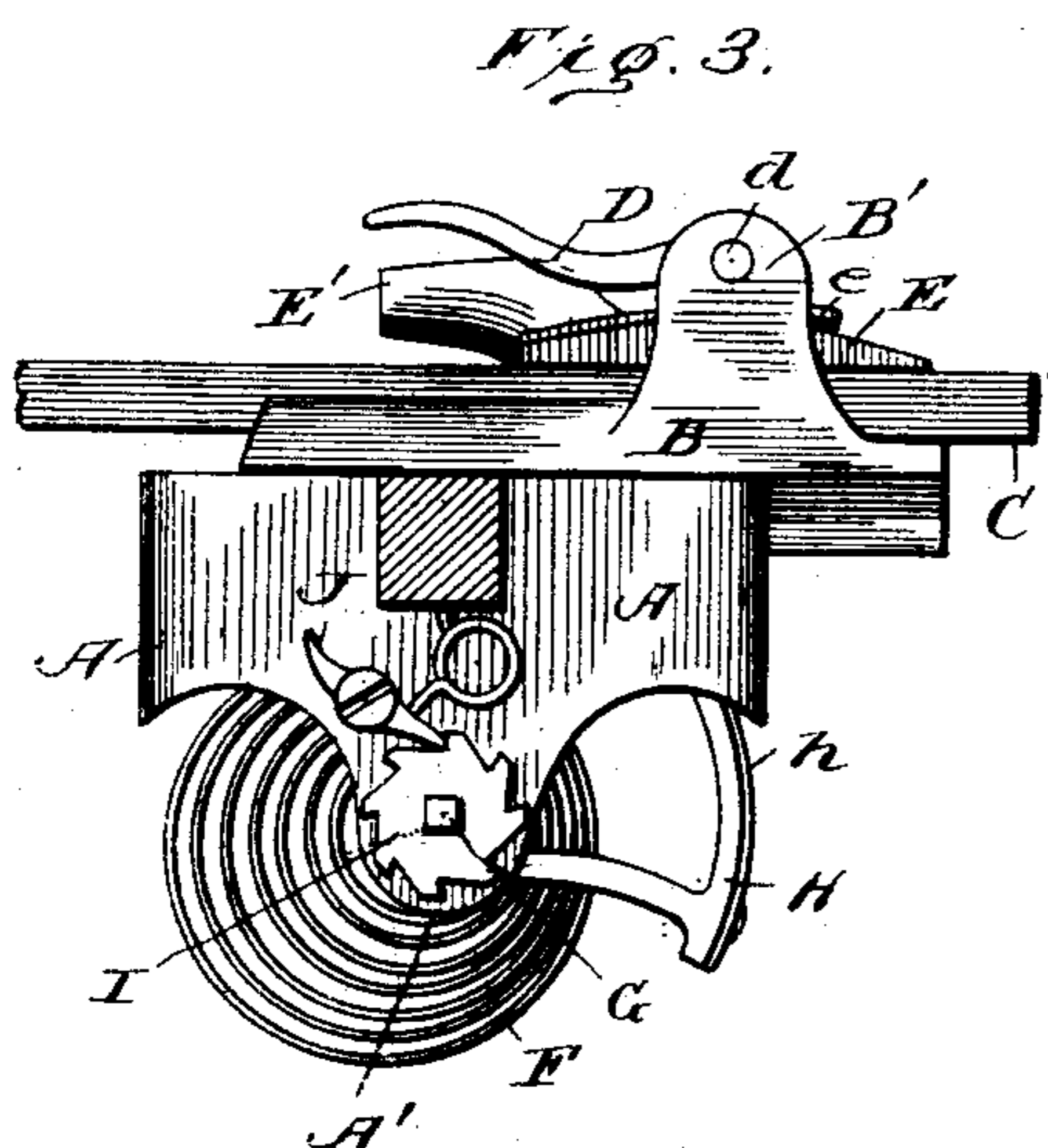
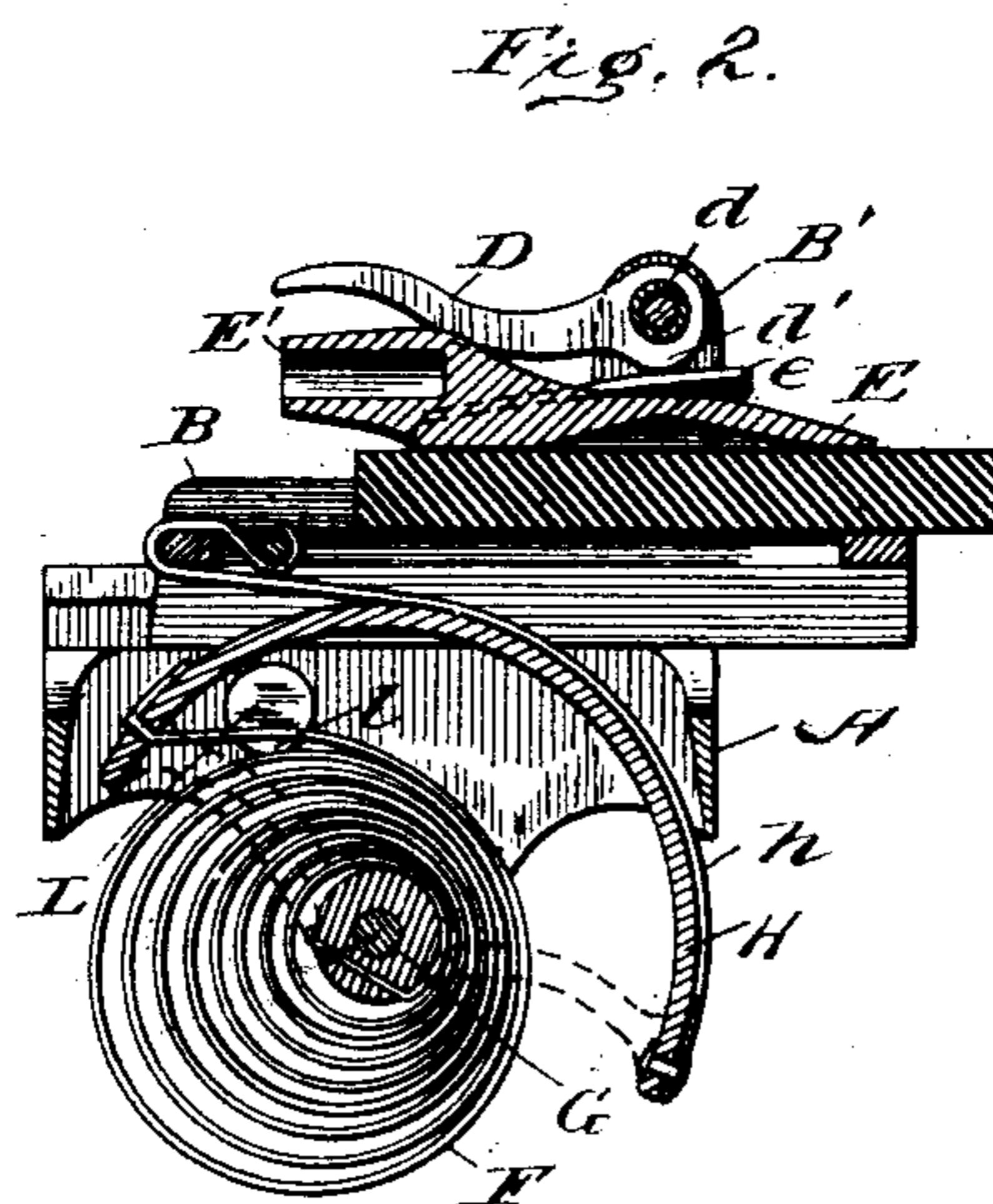
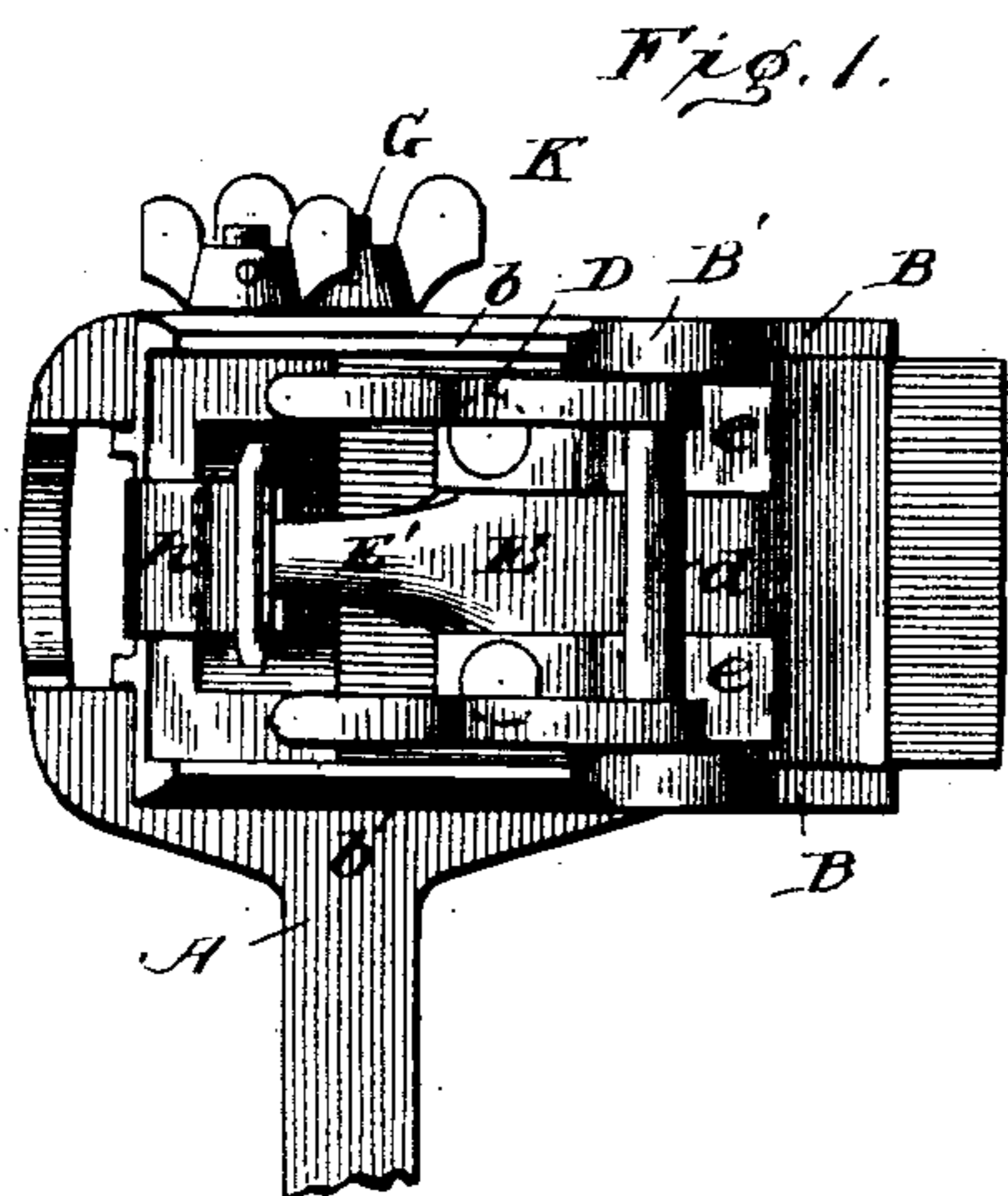


(No Model.)

J. R. COFFMAN.  
BRUSH HOLDER.

No. 510,892.

Patented Dec. 19, 1893.



Witnesses  
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# UNITED STATES PATENT OFFICE.

JOHN R. COFFMAN, OF DETROIT, MICHIGAN, ASSIGNOR OF ONE-HALF TO THE  
EUREKA TEMPERED COPPER COMPANY, OF NORTH EAST, PENNSYLVANIA.

## BRUSH-HOLDER.

SPECIFICATION forming part of Letters Patent No. 510,892, dated December 19, 1893.

Application filed December 9, 1892. Serial No. 454,558. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN R. COFFMAN, a citizen of the United States, residing in the city of Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Brush-Holders; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in brush holders for dynamo-electric machines or electric motors, the object being to provide a holder which will retain the brush in the proper position against the commutator plates with a light uniform pressure, and in which the brush may be adjusted by suitable clamps.

The invention consists in the combination of a support or frame, a brush carriage mounted in and adapted to reciprocate on said support, a brush mounted in said carriage, means for locking the brush in the carriage and means for impelling the carriage and holding the brush to its work.

It also consists in other arrangements and combinations of parts, as more fully herein-after set forth and claimed.

In the drawings, Figure 1, is a plan view of the device embodying my invention. Fig. 2, is a vertical central section of the same. Fig. 3, is a side elevation; and Fig. 4, is a rear end elevation of the same.

A is the main frame or support, made of copper or other suitable conducting material, and B is the brush carriage mounted in suitable ways *a a* in the frame A along which it is adapted to reciprocate. This carriage has flanges *b b* on each side extending longitudinally along its upper face and merging into risers *B' B'*. These flanges and risers form a seat for the carbon brush C.

D D are levers mounted on a rod *d* extending through the risers D D, having cam surfaces *d' d'* on their lower faces.

E is the clamp plate loosely fitted between the risers *B'*, between which and the bottom of the carriage B, the carbon C is inserted. On the top of the clamp plate is secured a pair of flat springs *e e*, beneath the free ends of which is a small strip of rubber or other

bushing. The clamps D D bear against these springs and by a downward movement of the levers the cam or eccentric portion bears against the clamp plates and retains the carbon to its seat. The plate E is also provided with a boss *E'* which is suitably bored or recessed for the insertion of an electric cable or conductor.

F is a coil spring, one end of which is secured to the shaft G mounted in bearings in the extended portions *A' A'* of the frame A, and the other end is secured to the rear end of the piece H. This piece H is formed in the shape of a segment of a circle, and is mounted loosely at its axis on the shaft G. To the other end of the segmental part H, is secured one end of a strap *h*, preferably made of sheet copper, the other end of said strap being secured to the rear of the carriage B. In this manner, the power of the spring is transmitted to the carriage B and tends to impel it to its forward position.

I is the ratchet-wheel secured to the inner end of the shaft G and engaged by the pawl J on the frame A. At the other end of the shaft G is a thumb nut K by which the shaft may be turned to wind up or increase the pressure of the spring F and thereby augment the pressure of the carbon against the commutator plates, to prevent sparking. The spring is held at any desired tension by means of the pawl and ratchet I and J.

L is a clamp for locking the carriage B at any point along its range of movement. It consists merely of a cam-shaped rod passing through the frame A and having a thumb nut by which it may be turned. In turning, the eccentric portion *l* bears against the under face of the carriage and holds the same in its place.

In using my device, the carbon is inserted originally by raising the clamp levers D D and slipping it in its seat under the clamp plate E. The levers are then turned down and the carbon clamped in proper position with one end projecting a short distance beyond the front of the carriage. This projecting end of the carbon bears against the commutator plates and is held to its work with a slight pressure by the spring F, through the part H, strap *h* and carriage B. As the

carbon becomes worn, it is necessary to force it farther along in its seat. To do this, I draw back the carriage against the force of the spring and clamp it in its rearward position by means of the eccentric clamp L. The carbon clamps D D are then released, the carbon is pushed forward to the desired position, reclamped, the carriage unclamped, and the brush is ready to proceed with its work.

It has been found in practice that as the carbon becomes worn, the spring becomes necessarily weaker, and if the proper tension is not kept on the carbon against the commutator plates, it causes sparking at the point of contact, and thereby a burning out of both the carbon and the commutator. It has also been found that the heat in the brushes transmitted to the springs takes the temper out of the same and thereby weakens them. It is to overcome this objection to other devices, therefore, that I have provided the simple and efficient means already described of increasing the tension of the spring. If at any time it becomes necessary to add to the pressure of the carbon against the commutator, one has to but give the button K a turn a distance of one or more notches on the ratchet I, and the proper additional tension is obtained.

From the above description, it will be seen that I have devised a simple and complete device for the purpose sought. The carbon is constantly kept against the commutator plates by a spring pressure. Any length of carbon may be used and the thickness need not be so exact as in other holders. The carbon may be fed forward from time to time as it becomes worn, and the pressure of the spring actuating the carriage may be suitably adjusted.

What I claim as my invention therefore, and desire to secure by Letters Patent, is—

1. In a brush-holder for dynamos and motors, the combination with a movable carriage mounted upon a suitable support and having a seat for the brush and risers at each side thereof, of a clamp plate located between said risers, and cam levers mounted on a shaft journaled in said risers, whereby the

brush may be held to the carriage, substantially as described.

2. In a brush holder for dynamos and motors, the combination with a movable carriage mounted in ways on a suitable support and provided with flanges and risers at each side, of a clamping plate located between the risers and provided with a recessed boss for the reception of the end of one of the conductors, springs secured to the clamping plate, and cam levers bearing against said springs, whereby the brush may be held yieldingly to its seat, substantially as described.

3. In a brush holder for dynamos and motors, the combination with the main frame having suitable longitudinal ways, of a movable carriage having flanges fitted and adapted to move in said ways, a segment pivoted in bearings below said carriage and connected thereto by a strap connected to said segment and a spiral spring secured at one end to the pivotal shaft of the segment and at the other to the main frame or support, so as to press the carriage forward toward the commutator of the dynamo or motor when the device is in place, substantially as described.

4. In a brush holder for dynamos and motors, the combination with a movable carriage, of a segment secured to a shaft mounted in bearings in the main frame below the carriage, a coiled spring secured to the shaft and to the main frame, a ratchet wheel mounted upon the said shaft, and a pawl, whereby the tension of the spring may be regulated, substantially as described.

5. The combination of a support or frame, a carriage movable therein, a loose shaft mounted in the support, a coiled spring connected with the loose shaft and the carriage means for rotating the loose shaft to adjust the tension of the spring and means for locking the shaft in its adjusted position, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

JOHN R. COFFMAN.

Witnesses:

WM. M. STOCKBRIDGE,  
THEO. L. GACHEL.