

(No Model.)

G. H. WHITE.
CARBON BRUSH HOLDER.

No. 549,663.

Patented Nov. 12, 1895.

Fig. 1.

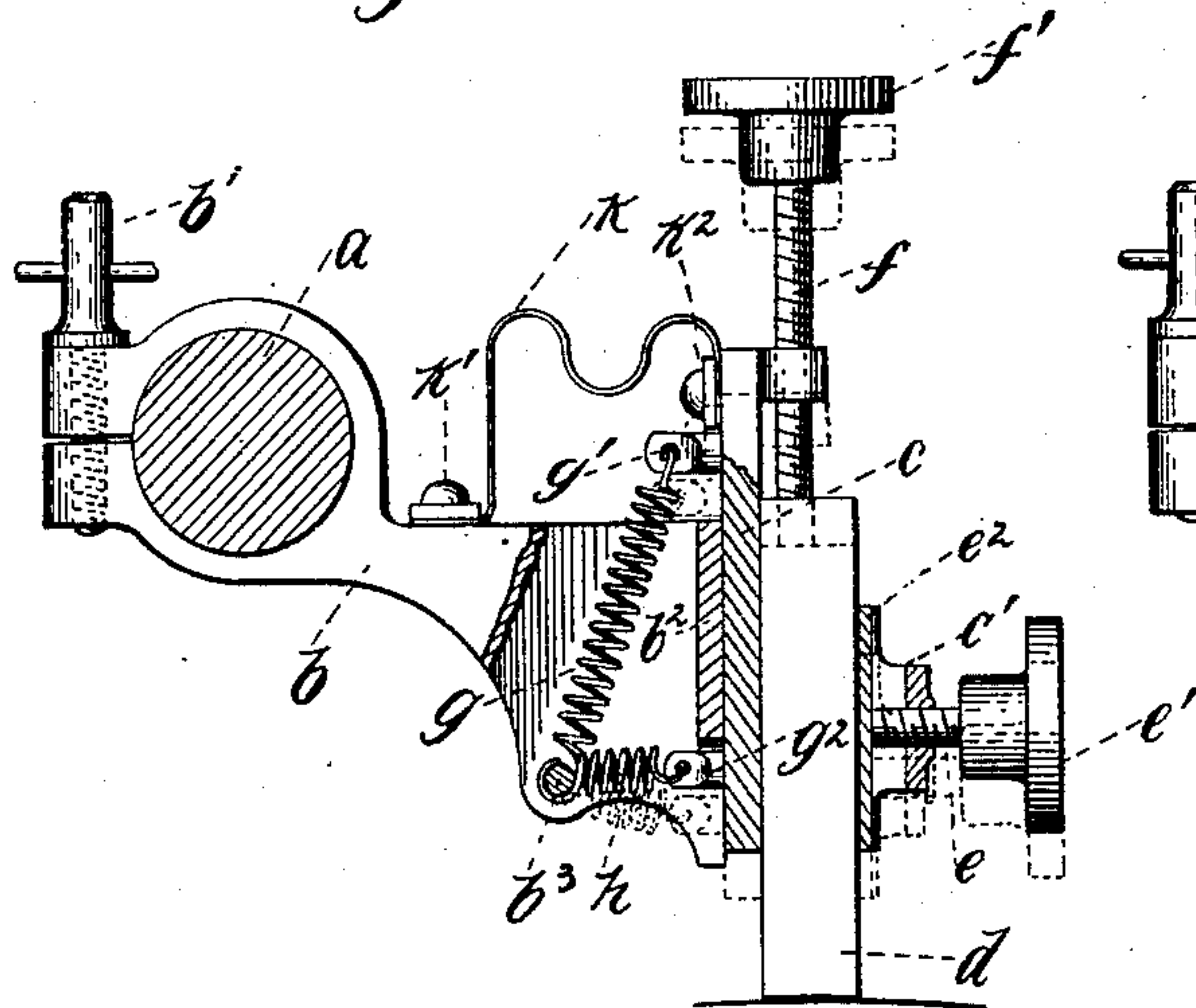


Fig. 2.

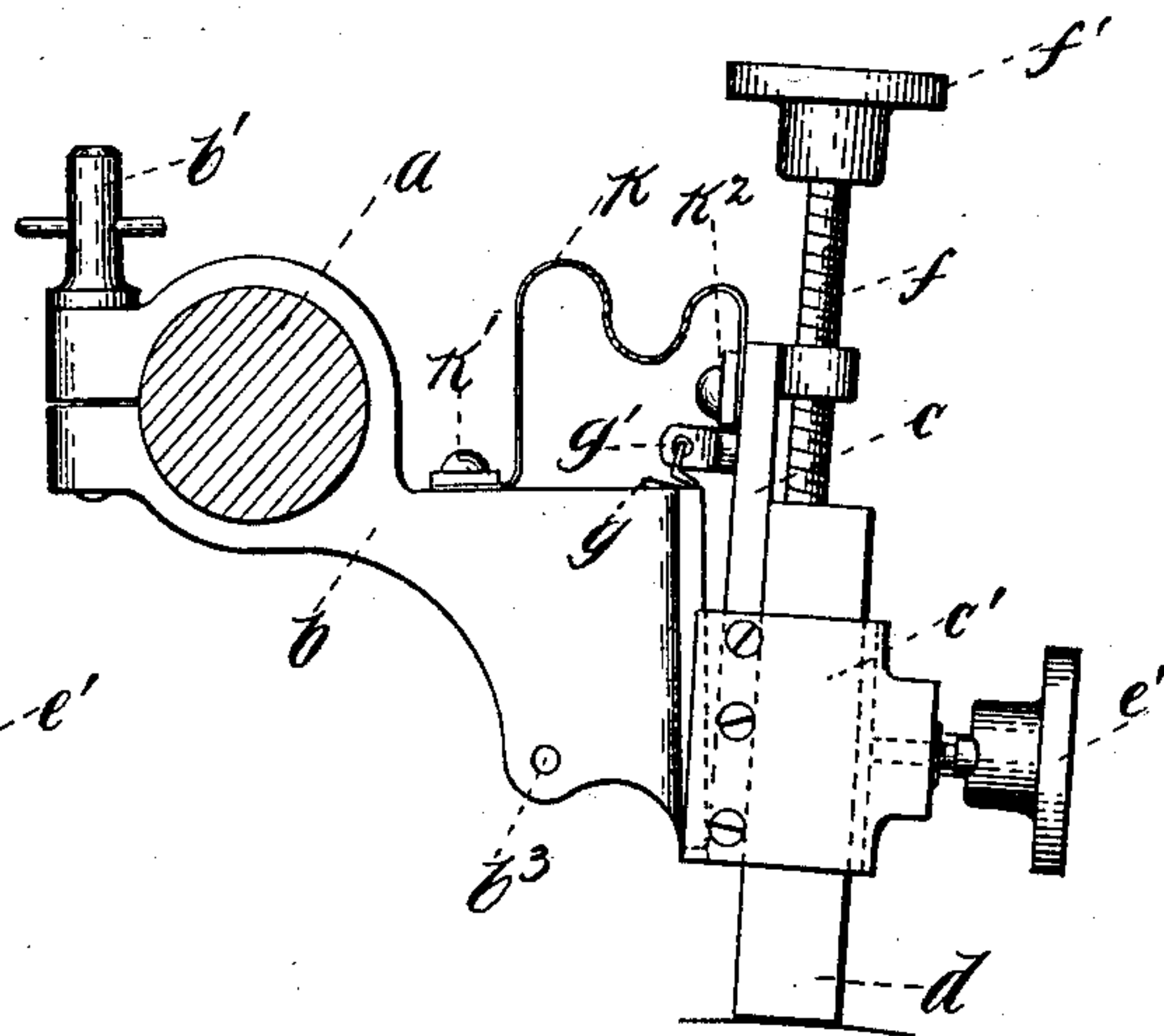


Fig. 3.

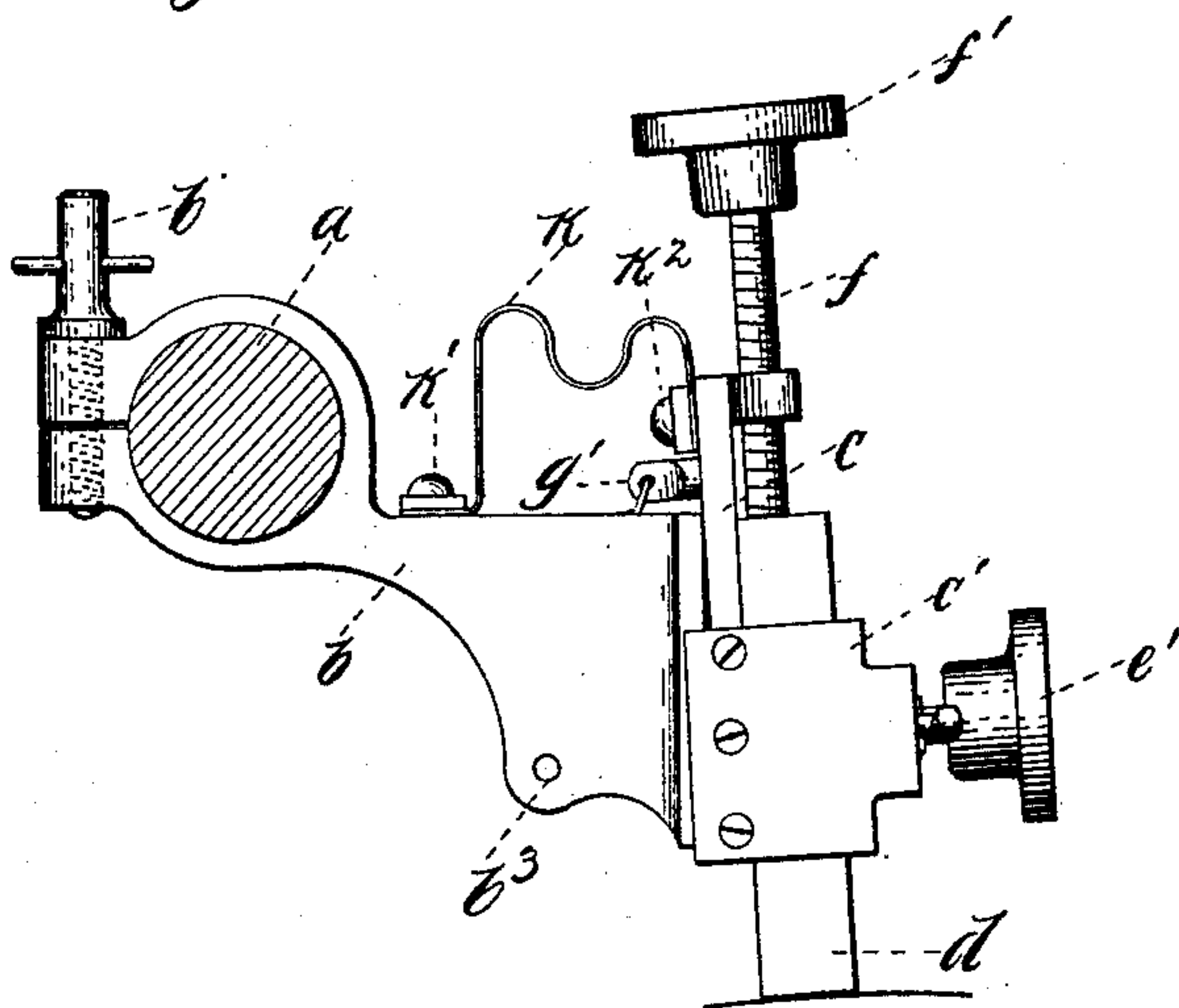
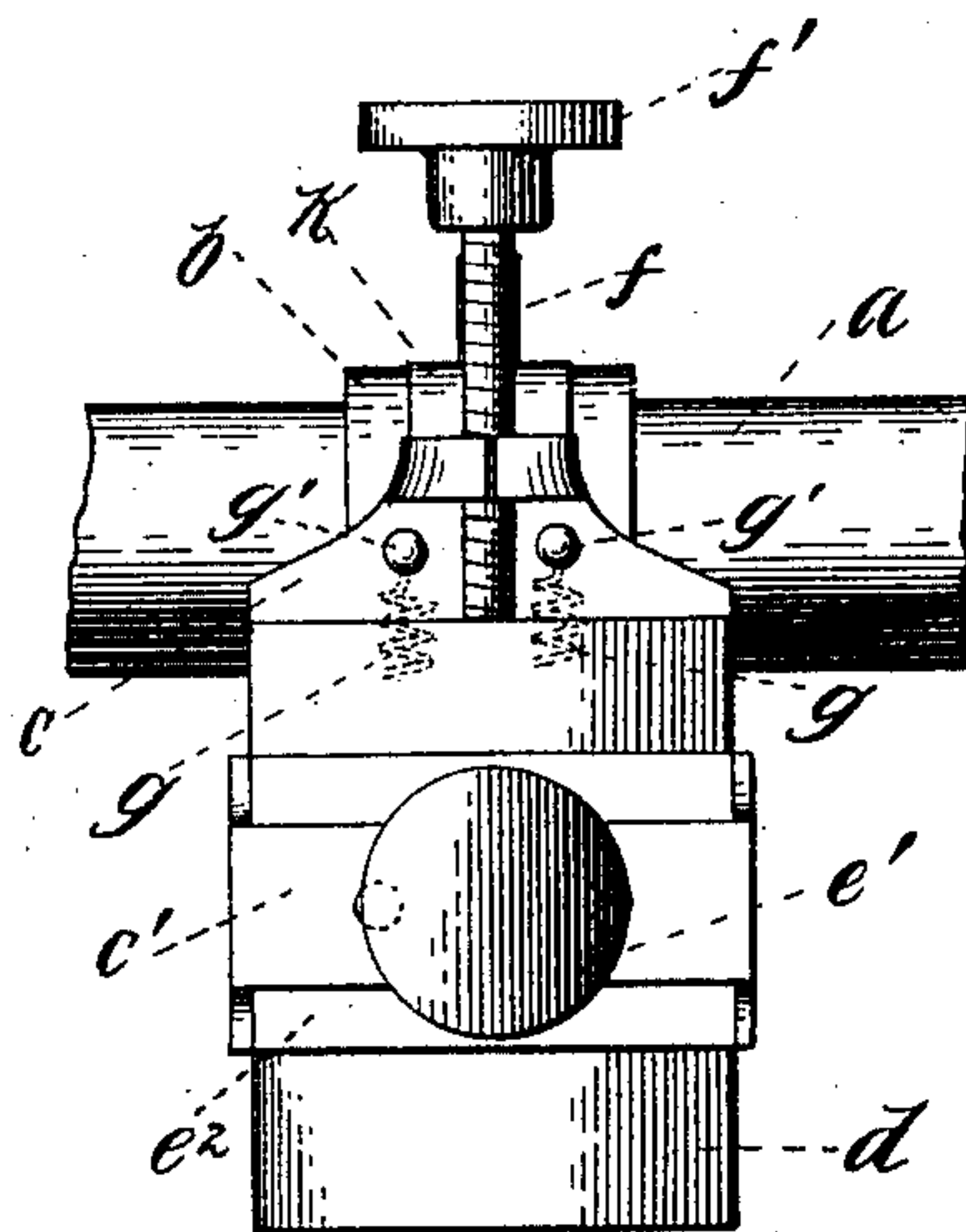


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE H. WHITE, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE SIEMENS & HALSKE ELECTRIC COMPANY OF AMERICA, OF SAME PLACE.

CARBON-BRUSH HOLDER.

SPECIFICATION forming part of Letters Patent No. 549,663, dated November 12, 1895.

Application filed August 5, 1895. Serial No. 558,249. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. WHITE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Carbon-Brush Holders, of which the following is a specification.

My invention relates to a carbon-brush holder, my object being to construct a brush holder in which the carbon-brush may be firmly maintained in electrical contact with the metallic portions of the holder, while the carbon is mounted so that it may have a freedom of motion relatively to the fixed holder to permit the carbon to readily adapt itself to the commutator. The carbon block or brush is mounted in a clamp or housing, in which it is securely fastened, the face of the brush being maintained in contact with a plane surface of the housing, whereby the resistance between the brush and the metallic portions of the holder is reduced to a minimum. The clamp in which the brush is mounted has a freedom of movement relatively to the stationarily-mounted portion of the holder such that the clamp may move relatively to the holder in a longitudinal direction or may be rotated either forward or backward in the plane of rotation of the commutator. Springs are provided for yieldingly maintaining the clamp in a definite position relatively to the holder, so that the brush is maintained upon the commutator due to the tension of the springs and is fed forward by said springs as the brush wears away. By mounting the carbon block fixedly within a carbon-clamp the necessity of coating the carbon with copper or other conducting material is avoided. Between the clamp and the holder is provided a flexible conductor, which insures a good electrical connection between the stationary and movable parts of the holder. Upon the clamp or housing is provided an adjusting-screw, by means of which the carbon-brush may be moved within the clamp as may be desired. Initially the pressure with which the brush is pressed against the commutator may be determined by adjusting the position of the stationary holder upon its supporting-rod, while during the operation of the machine the tension may

be adjusted from time to time by means of the screw, which moves the carbon block within its holder. Two sets of springs are provided, one of which opposes the rotation of the clamp relatively to the holder in one direction, while the other set opposes the rotation in the opposite direction. When the armature rotates in one direction, one set of springs is made of increased tension, while when it rotates in the opposite direction the other set of springs is made of increased tension.

Referring to the accompanying drawings, Figure 1 is a view, partially in section, of the brush-holder of my invention. Fig. 2 is a similar view showing the carbon-clamp rotated in one direction. Fig. 3 is a similar view showing the clamp rotated in the opposite direction. Fig. 4 is a front view of the carbon-holder.

Like letters refer to like parts in the several figures.

Upon the supporting rod or arm *a* is mounted the holder *b*, a screw *b'* being provided whereby the holder *b* may be clamped upon the rod *a* or may be released to permit the angular adjustment of the holder upon the rod *a*. The holder *b* is provided with a surface-plate *b²*, against which rests the carbon clamp or housing, which is provided with a plate *c*, adapted to rest against the surface-plate *b²*. Within the clamp is provided the carbon or brush *d*, the face of which rests against the plate *c* to insure firm electrical contact between the brush *d* and the clamp. A screw *e*, provided with a thumb-piece *e'*, is adapted to engage a tapped hole in the housing *c'*, secured to the plate *c*, and engages by its end a clamping-plate *e²*, which when the screw is turned is pressed against the carbon *d* to maintain it more intimately in contact with plate *c*. At the upper end of the clamp is provided an adjusting-screw *f*, provided with a thumb-piece *f'*, the end of the screw resting upon the top of the carbon block *d*, whereby when the screw *e* is turned to unclamp the carbon the carbon may be moved downward relatively to the plate *c* through the agency of the screw *f*. Upon the holder *b* is carried a rod *b³*, to which are secured the ends of the springs *g g*,

the opposite ends of the springs being connected with posts g' g' , carried upon the rear of plate c . Likewise the spring or springs h extend between the rod b^3 and the post g^2 , carried upon the rear of the plate c . The springs thus co-operate to maintain the clamp in engagement with the surface-plate b^2 , but permit the movement of the clamp relatively to the surface-plate. The clamp may rotate about the lower end of the surface-plate b^2 , as illustrated in Fig. 2, or it may rotate about the upper end of the surface-plate, as illustrated in Fig. 3, the coiled springs serving to move the clamp into position to return the clamp to its original position against the surface-plate b^2 when the force tending to rotate the clamp is removed. The brush may be employed with a commutator rotating in either direction. If, as seen in Fig. 3, the rotation be clockwise, the spring h should be made of increased tension to counteract the pull due to the friction of the commutator upon the brush. If the rotation be in the opposite direction, the springs g should be made of increased tension. By thus inserting springs of a greater or less tension the brush may be adapted for rotation in either direction. When the clamp is rotated relatively to the holder, as illustrated in Figs. 2 and 3, the clamp makes contact with the holder only along a single line, and it is therefore desirable to provide a permanent electrical connection of considerable cross-section between the clamp and the holder. For this purpose a flat piece of metal k is secured by one end to the holder b by means of screws k' and at the opposite end to the clamp by means of screws k^2 , the intermediate portion being bent or convoluted to permit the clamp to move freely relatively to the holder.

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

1. In a carbon brush holder, the combination with a clamp having a flat surface against which the carbon brush or block is adapted to be fixedly clamped, of a holder upon which said clamp is mounted, and a resilient connection between said clamp and said holder

permitting the longitudinal movement of said clamp and also a rocking movement forward and backward in the plane of the commutator; substantially as described.

2. The combination with a holder having a surface plate, of a clamp or housing containing the carbon brush and resting against said surface plate, means being provided for permitting the rotation of said clamp about the upper or the lower end of said surface plate and for permitting the longitudinal movement of the clamp relatively to the surface plate; substantially as described.

3. The combination with the holder b carrying the surface plate b^2 , of the clamp comprising the plate c adapted to rest against the surface plate b^2 , the carbon brush being normally fixedly clamped against said plate c , the bar b^3 mounted upon the holder, and springs g and h between said bar b^3 and the posts g' g^2 carried upon the plate c ; substantially as described.

4. The combination with a holder, of a clamp adapted to rotate in one direction about the upper end of said holder, and in the opposite direction about the lower end of said holder, and springs for resiliently opposing the rotation in either direction, whereby the brush holder may be adapted to an armature rotating in either direction by increasing the tension of the spring opposing the force due to the friction of the brush upon the commutator; substantially as described.

5. The combination with the holder b , provided with surface plate b^2 , of the clamp, comprising the plate c , housing c' , clamping plate e^2 and clamping screw e , the adjusting screw f , rod b^3 mounted upon the holder, springs g and h situated between said rod b^3 and the posts g' and g^2 provided upon the plate c , and the convoluted or bent flat conductor k electrically connecting the clamp with the holder; substantially as described.

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

GEORGE H. WHITE.

Witnesses:

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