

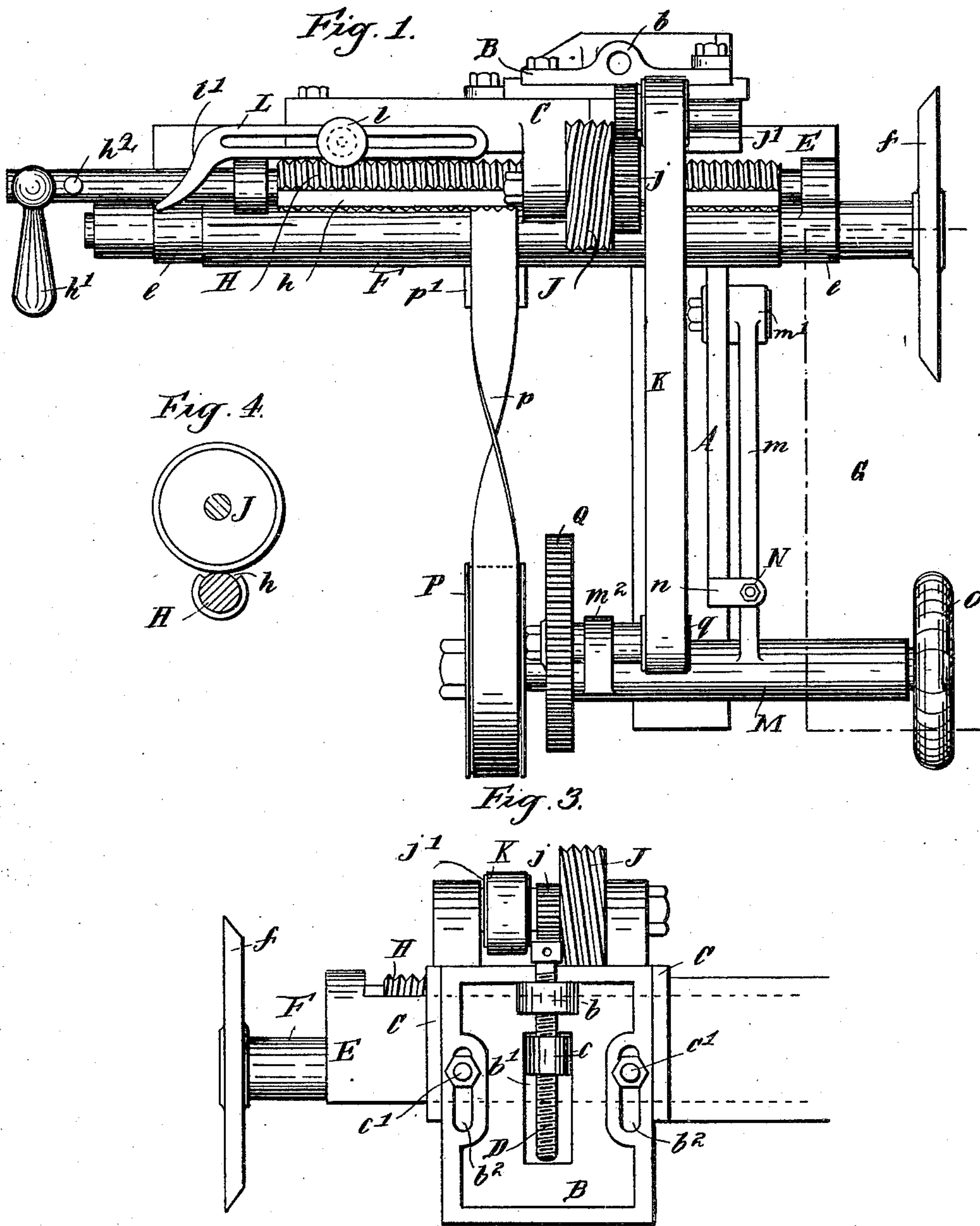
J. PHILLIPS.

## APPARATUS FOR TRIMMING COMMUTATORS.

(Application filed Apr. 6, 1901.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses

William James Cox  
 Frank William Pattison

Inventor

John Phillips  
 By his Attorney.  
 Geo. H. Rayner

No. 696,479.

Patented Apr. 1, 1902.

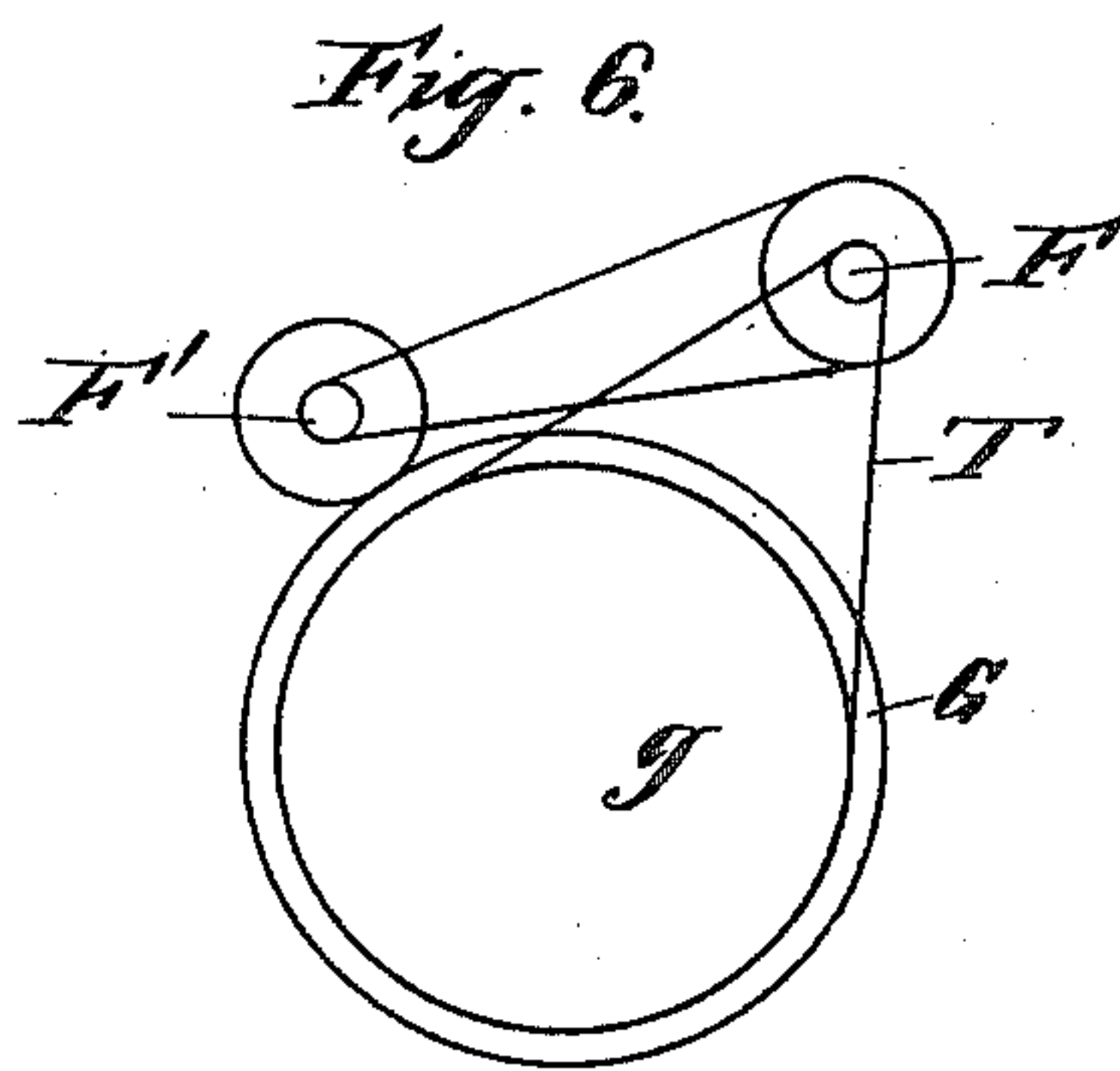
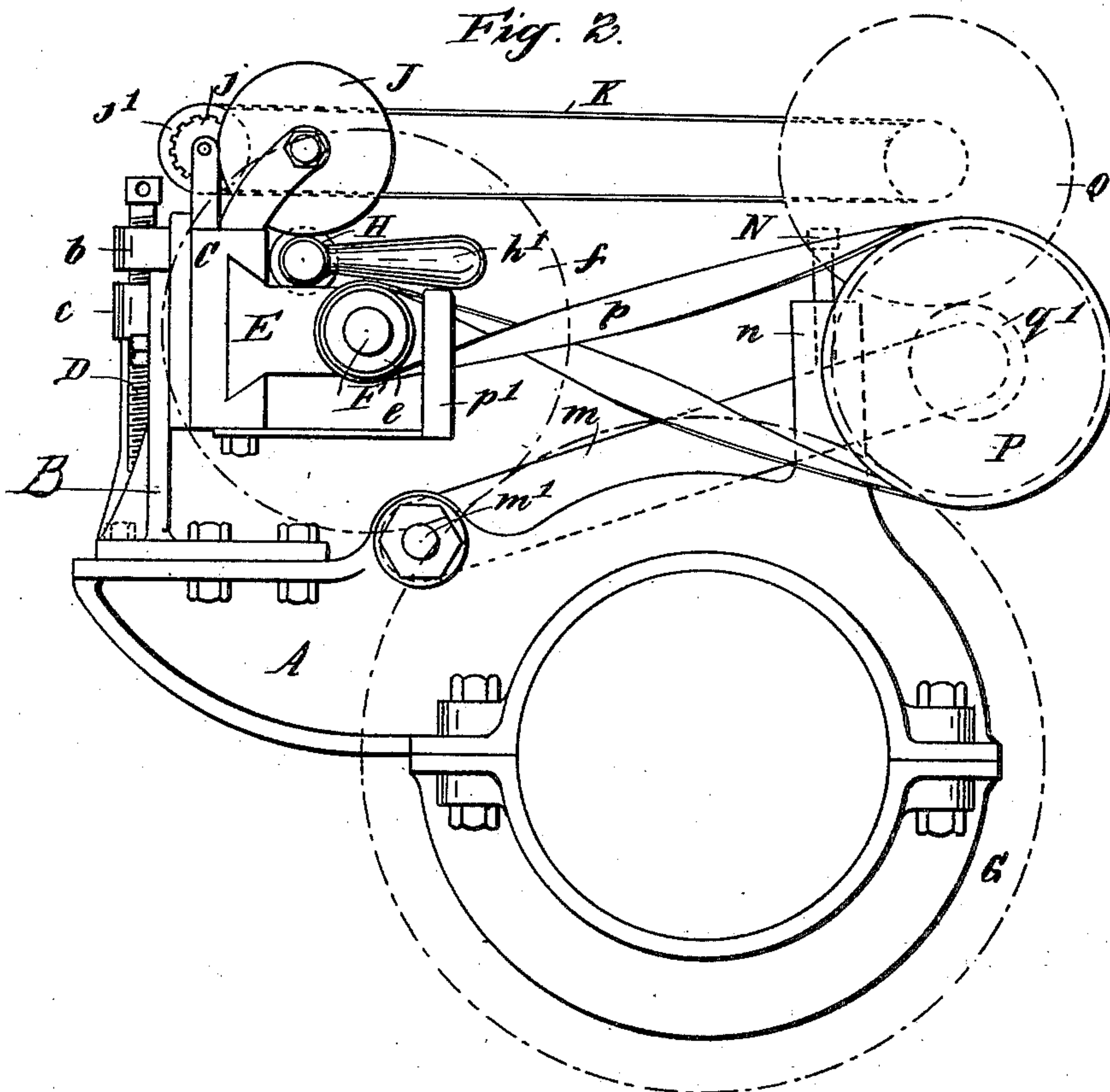
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3 Sheets—Sheet 2.



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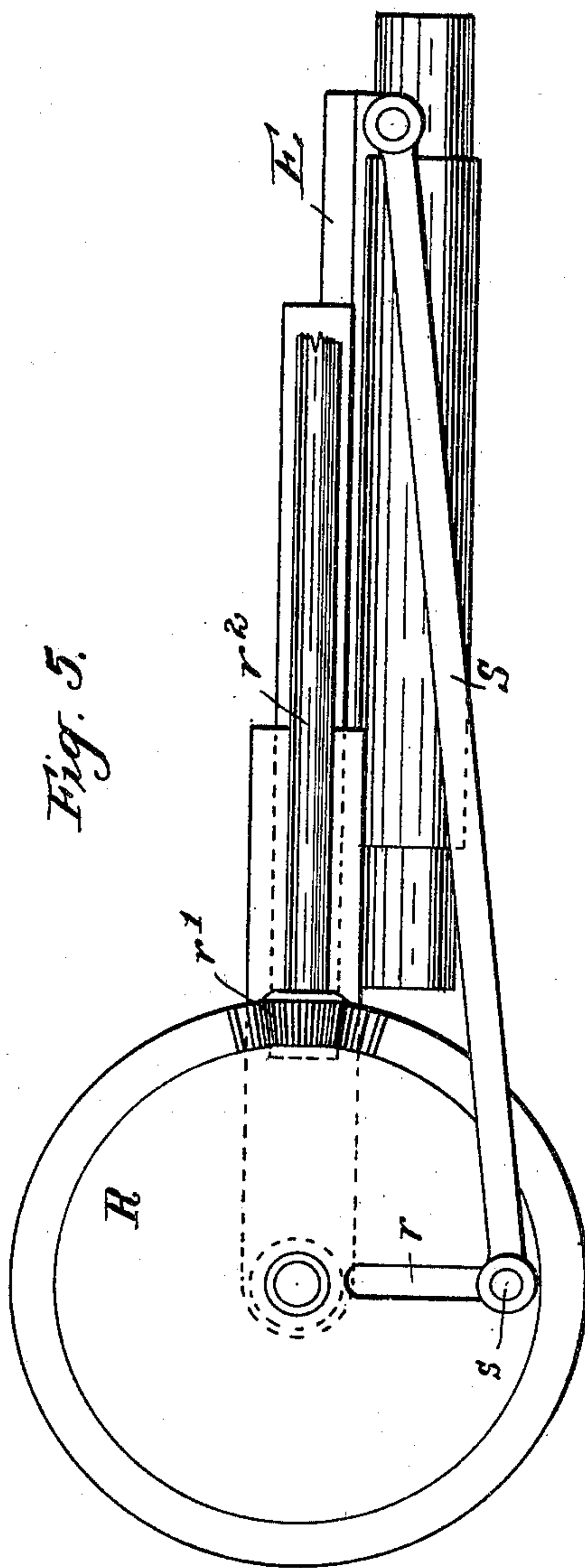
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3 Sheets—Sheet 3.



Witnesses

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# UNITED STATES PATENT OFFICE.

JOHN PHILLIPS, OF LONDON, ENGLAND.

## APPARATUS FOR TRIMMING COMMUTATORS.

SPECIFICATION forming part of Letters Patent No. 696,479, dated April 1, 1902.

Application filed April 6, 1901. Serial No. 54,739. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN PHILLIPS, a subject of the King of Great Britain and Ireland, residing at 166 Walworth road, London, S. E., England, have invented a certain new and useful Improved Apparatus for Trimming Commutators, of which the following is a specification.

This invention relates to apparatus for use in trimming or truing commutators of dynamo-electric machinery while in position, which invention allows a commutator to be properly trimmed without requiring the use of separate driving apparatus, the emery-wheel or cutter employed being driven from the commutator itself.

In order that this invention may be more readily understood, reference is had to the accompanying sheet of drawings, in which—  
Figure 1 is a plan of an apparatus constructed according to my invention. Fig. 2 is an end view of the same; Fig. 3, a side view of part of the apparatus; Fig. 4, a detail view of the traversing device for the trimming-wheel. Fig. 5 shows a modification of part of the apparatus, and Fig. 6 a diagrammatic view illustrating a modified method of driving the apparatus.

Referring to Figs. 1 to 4, A is a fixed supporting-frame which can be clamped upon the rocker-bearing of the dynamo or motor, or a frame may be secured to any other convenient fixed part of the machine, the particular method of supporting the apparatus being immaterial. To the main frame is bolted the fixed standard B, which carries the slide C, adjustable vertically by means of the set-screw D, passing through the lugs *b* at the top of the part B and the lug *c* upon the slide extending through the slot *b'*. The side bolts *c'*, extending through the slots *b''*, serve to fix the slide in the position to which it has been adjusted. The inner face of the slide is formed with a dovetailed groove which receives the sliding carriage E, carrying in bearings *e* the large spindle F, upon the front end of which is the emery-wheel *f*. The emery-wheel meets the surface of the commutator G, the position of which is shown in chain lines in Figs. 1 and 3, and as the emery-wheel is caused to rotate rapidly and at the same time to traverse the commutator in

the manner hereinafter described the entire surface of the commutator is evenly trimmed.

The entire carriage E is caused to traverse the apparatus by means of the rack H, which is in the form of a long screw having the thread cut away for a portion of the circumference at *h*, forming a smooth channel. This screw-rack is carried in bearings at each end of the carriage and is provided with the handle *h'*, by which it can be turned through about a quarter-circle, bringing either the screwed part or the smooth channel into top position for the purpose hereinafter described.

The slide C carries in bearings at its upper side the worm-wheel J, driven by the intermediate gear *j* from a pulley *j'*, over which the band K, leading from the driven part of the apparatus, passes. When the rack H is turned into engaging position—that is, when its screw-threaded portion is uppermost—the worm-wheel J engages with it, and when the apparatus is in action and the worm-wheel revolving the rack, with the carriage, is slowly driven forward, moving the emery-wheel over the surface of the commutator. At the end of the travel the rack is thrown out of gear and the carriage can be drawn back quickly for the next cut.

In Fig. 1 a simple arrangement is shown by means of which the rack can be thrown automatically out of gear when the emery-wheel has reached the end of its path. This device consists of a slotted plate L, secured upon the slide C by the set-screw *l* and having the curved end *l'* adapted to engage with the pin or arm *h''* upon the screw-rack H. As the carriage moves forward toward the end of its path the pin *h''* meets the curved stop *l'* and is turned over, so as to turn the rack H into inoperative position, as shown in the detail view, Fig. 4. In this position the smooth channel is uppermost and the worm-wheel is clear of the rack. As the position of the plate L can be adjusted, the travel of the carriage and emery-wheel can be altered as required. For clearness this part is not shown in Fig. 3.

The driving mechanism of the apparatus is also carried by the main frame A and is supported by the bearing M upon the end of the arm *m*, which is pivoted at *m'* to a lug upon the frame. The arm *m* is thus free to turn



upon a fulcrum; but it is prevented from rising by the adjustable set-screw N, carried by the extension *n* at the upper side of the frame A.

5 Upon the spindle carried in the bearing M the bearing-wheel O is mounted at one end, and at the other is a drum P, over which the band *p* passes, driving the large spindle F, above described. To keep the belt *p* in position as the carriage and spindle F travel, the  
10 fork *p'* is provided, fixed upon the slide C. The wheel O bears upon the commutator and is revolved rapidly as the commutator turns, and the motion is transmitted to the emery-  
15 wheel through the drum P and spindle F, the emery-wheel being thus driven at a very high speed and as the belt *p* is caused to cross in the same direction as the commutator.

A lug or extension *m*<sup>2</sup> upon the bearing M  
20 carries the large toothed wheel Q and the pulley-wheel *q*, over which the band K passes. A small pinion *q'* upon the spindle carrying the driving-wheel O gears with the wheel Q, so that the worm-wheel J is driven through  
25 two sets of reducing-gear by means of the wheel O, rotated by the commutator. The pressure of this wheel upon the commutator is adjusted by the set-screw N, and as the whole driving mechanism is carried by the  
30 arm *m* the apparatus can be adjusted to various sizes of commutator without difficulty.

In the modification shown in Fig. 5 instead of employing the rack H and worm-wheel J to give the traversing motion to the sliding  
35 carriage a beveled wheel R, slotted at *r*, is driven by means of the small beveled pinion *r'* upon the spindle *r*<sup>3</sup>, rotated by the gearing which turns the worm-wheel J in Figs. 1, 2, and 3. The beveled wheel R is thus turned  
40 very slowly, and the carriage E is moved by means of the link S, connected to it at the front end and secured at its other end to a pin *s*, carried by the slot *r*. As the beveled  
45 wheel R turns a slow reciprocating motion is given to the carriage, so that the emery-wheel is caused to travel backward and forward upon the commutator without special  
50 attention. The length of travel is adjusted by means of the slot *r*, the pin *s* being adjusted to any point of this slot. The apparatus is otherwise similar in construction to that illustrated in Figs. 1, 2, and 3.

Instead of employing a bearing-wheel, such as O, resting upon the surface of the commu-  
55 tator, I may drive the apparatus by other means, such as bands, as shown in Fig. 6. In this figure a band T is placed upon the reduced end *g* of the commutator G, driving the spindle F, upon which is the emery-wheel,

through the intermediate drum F'. As the  
60 general construction of the apparatus and the method of moving the sliding carriage may be the same as that already illustrated, a diagrammatic view of the band connection  
65 only is shown.

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

1. In an apparatus for trimming commutators in position, a rotating trimming-wheel, a sliding carriage carrying the wheel, means  
70 for automatically traversing this sliding carriage and moving the wheel over the surface of the commutator, and driving mechanism actuated by the rotating commutator, having connections to the trimming-wheel and  
75 sliding carriage causing the wheel to revolve and the carriage to travel, substantially as herein described.

2. In an apparatus for trimming commutators in position, the combination with a ro-  
80 tating trimming-wheel, a sliding carriage supporting the trimming-wheel, adjustable slide in which the carriage can travel and means for effecting the traversing motion of the carriage and for stopping it at the required  
85 points, of driving apparatus actuated by the revolving commutator, connections between the driving apparatus and the trimming-wheel and connections with reducing-gear-  
90 ing between the driving mechanism and the sliding carriage, substantially as herein described.

3. In an apparatus of the kind described, a sliding carriage supporting the trimming-  
95 wheel and a rack upon the said carriage consisting of a screw having a portion of the thread removed throughout its length, adapted to engage with a revolving worm to give a traversing motion to the carriage and to be  
100 disengaged on turning, substantially as herein described.

4. In an apparatus of the kind described, the combination with a fixed support, a ver-  
105 tically-adjustable slide C, a sliding carriage E, trimming-wheel *f* upon the spindle F, screw-rack H, and worm-wheel J, of a driving-wheel O supported in the bearing M, pivoted arm *m* upon the fixed support and carrying the bearing M and connections from  
110 the driving-wheel to the trimming-wheel and to the worm-wheel, substantially as herein described and shown.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

JOHN PHILLIPS.

Witnesses:

A. M. GLASS,  
F. W. PATTISON.