

No. 618,579.

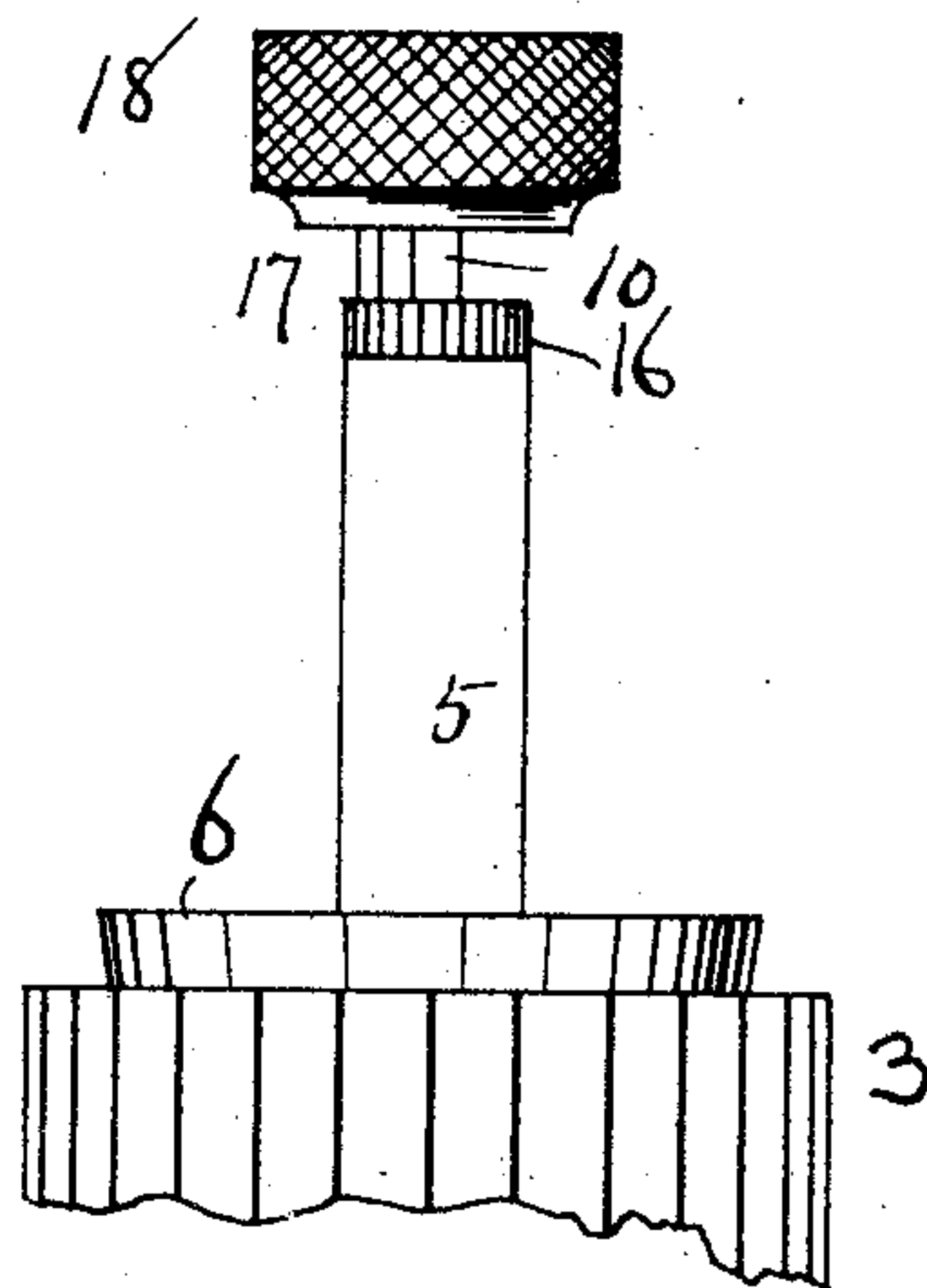
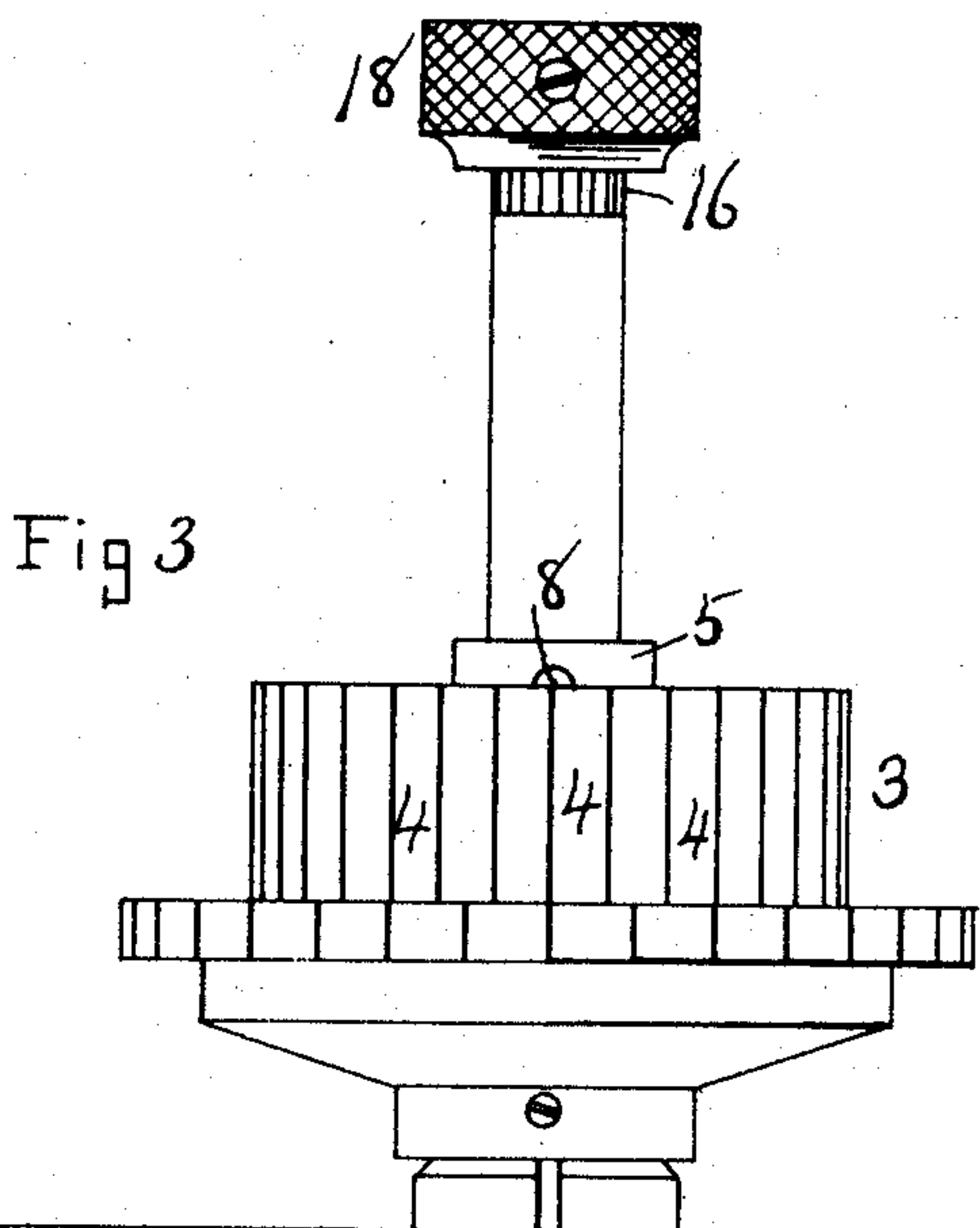
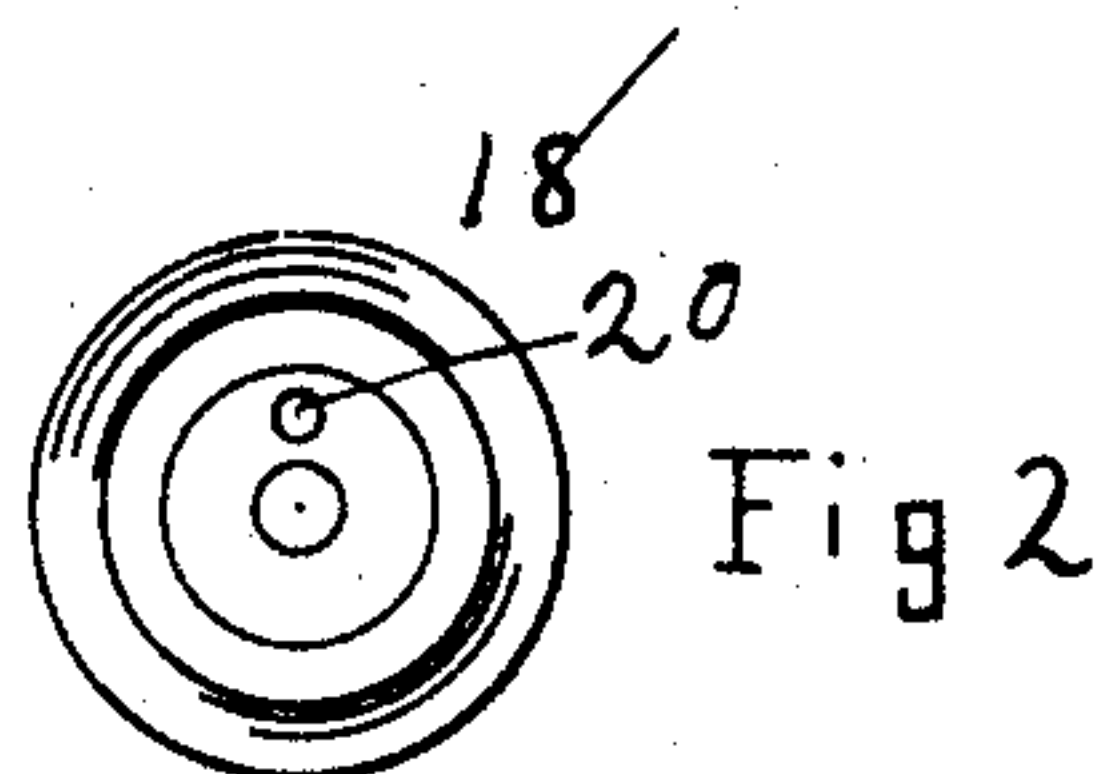
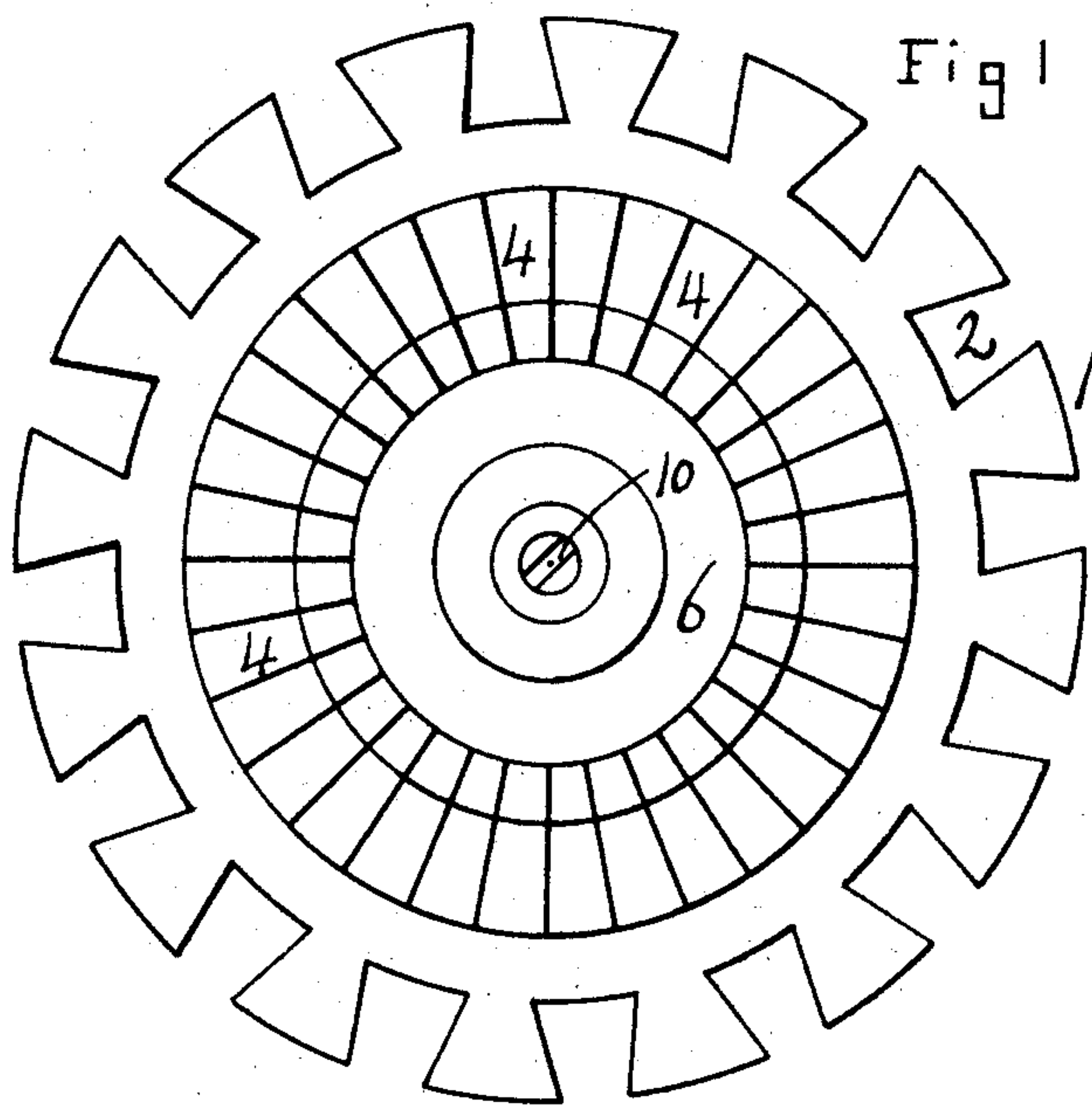
Patented Jan. 31, 1899.

E. C. NEWCOMB.
COMMUTATOR SHORT CIRCUITER.

(Application filed June 21, 1898.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:
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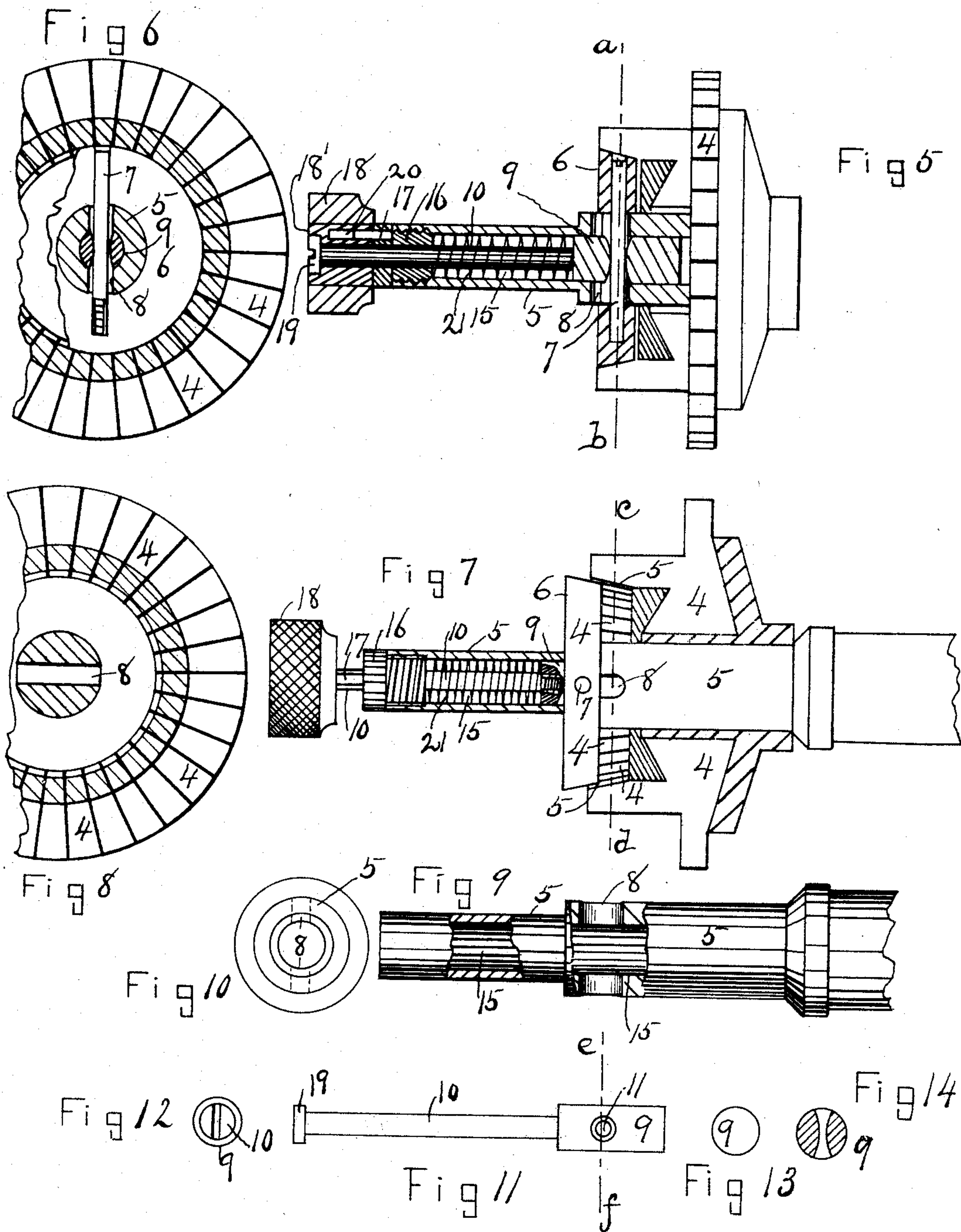
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UNITED STATES PATENT OFFICE.

EDWARD C. NEWCOMB, OF BROOKLINE, MASSACHUSETTS, ASSIGNOR TO THE
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COMMUTATOR SHORT-CIRCUITER.

SPECIFICATION forming part of Letters Patent No. 618,579, dated January 31, 1899.

Application filed June 21, 1898. Serial No. 684,061. (No model.)

To all whom it may concern:

Be it known that I, EDWARD C. NEWCOMB, a citizen of the United States of America, and a resident of Brookline, county of Norfolk, and State of Massachusetts, have invented a new and useful Improvement in Commutator Short-Circuiters, of which the following is a specification.

My invention relates to a manual device for electrically connecting to one another through a low resistance the segments of a commutator of electric currents.

The organization comprising the practical working out of the invention consists of a conically-shaped circuit-closer adapted to be pressed against the tapered ends of the commutator-segments and having a central hole through which passes the shaft of the commutator, so that the said circuit-closer may slide back and forth or to and from the said segments; a pin carried by the conical circuit-closer and passing loosely through an elongated hole in said shaft, so that the extent of movements of the circuit-closer in both directions may be limited; a milled head located at the extremity of said shaft and carrying a rod which extends into a hole running longitudinally of said shaft and connected to an enlarged rod, through which passes loosely said pin transversely, so that the circuit-closer may be pulled back and forth manually by taking hold of said milled head; a spring for normally forcing the rod inward and therefore for forcing said circuit-closer against the commutator-segments, the said spring being helical and surrounding the smaller rod and extending between the said enlarged end; a cap which is screwed into the end of the shaft, and a pin projecting from the cap and adapted to extend into a hole in the said milled head.

Figure 1 is an end elevation of the complete invention shown in conjunction with an armature-core. Fig. 2 is a view of the milled head reverse from that shown in Fig. 1. Fig. 3 is a plan of that which is shown in Fig. 1, part of the armature being broken off. Fig. 4 shows a portion of that which is shown in Fig. 3, but in a different phase. Fig. 5 is a view partly in longitudinal vertical section of

a portion of that which is shown in Fig. 3 and in the same phase. Fig. 6 is a section at the line *a b* in Fig. 5. Fig. 7 is a view mostly in vertical longitudinal section of more than that shown in Fig. 4 and in the same phase. Fig. 8 is a cross-section at the line *c d* in Fig. 7. Fig. 9 is a view of the shaft of the commutator by itself and broken away to show the two holes running transversely and longitudinally, respectively. Fig. 10 is an end view of the shaft, looking from the left. Fig. 11 is a view of the rod with its enlarged portion. Fig. 12 is an end view thereof, looking from the left. Fig. 13 is an end view thereof, looking from the right. Fig. 14 is a section at the line *e f*.

1 is an armature-core having the usual dovetailed slots 2 and formed of laminæ of iron sheets. The commutator 3 has segments 4, arranged in a circle around the shaft 5 and having the inner surfaces 5 tapered.

6 is a conical ring surrounding the shaft 5, loosely and normally fitting against the tapering surface 5, so as to be in intimate contact with all of the segments 4, thereby causing all the coils of the armature to be closed upon themselves. The conical ring 6 is therefore a circuit-closer.

7 is a pin located within the circuit-closer 6 and extending through a hole 8 in the shaft 5, the said hole being larger than the pin, so that the latter may move with the circuit-closer back and forth longitudinally of the shaft 5. The pin also extends through a doubly-tapering hole in a rod 9, which is practically an enlargement of a rod 10, the hole being numbered 11. The pin 7 is fixed within the circuit-closer 6. The rod 10 extends through a hole 15, running longitudinally of the shaft and through a hole in the cap 16, which is screwed into the end of the shaft 5 and which carries a pin 17. The rod 10 also passes through a milled head 18, which is prevented from leaving the rod 10 on account of the screw-head 19. The head 18 may be of brass having a core 18' of steel. In one phase of the head 18 the pin 17 extends into a hole 20 in the core 18'. In another phase of the device, as shown in Figs. 4 and 7, the pin 17 is not in the hole 20, but rests against another

portion of the core 18'. The pin 17 thus serves to lock the handle 18, and with it the circuit-closer 6, either in "on" or "off" position, so that the circuit is respectively short-circuited from one segment to the other or opened. Between the cap 16 and the enlarged rod 9 and surrounding the rod 10 is a helical spring 21. One end of the spring presses on the rod 9 and the other end of the spring presses on a cap 16.

The operation of the device embodying my invention is as follows: In certain types of motors it becomes necessary at certain steps of the operation to close all the coils of the armature upon themselves, or, in other words, to electrically connect to one another the segments of the commutator. It is necessary in such motors to be able to make these connections while the shaft of the commutator is rotating. Figs. 4 and 7 show the condition the device should be in while the shaft 5 is rotating. It will be noticed therein that the milled head 18 is held to one side, and with it the circuit-closer 6, which is therefore separated from the commutator-segments by an air-gap. It is the pin 17, carried by the cap 16 and bearing against the steel core 18', that holds the milled head 18 to one side. When it is desired during the rotation to operate the circuit-closer 6, so that it will close the commutator-segments, the motorman merely catches the milled head 18 for an instant with his fingers or with any convenient tool, so as to stop or partially stop it from rotating temporarily. The result is that in almost an instant the pin 17 comes to the hole 20, and therefore the spring 21, being thus compressed, presses against and moves the enlargement 9, and with it the circuit-closer 6, until the latter presses against and electrically closes the commutator-segments.

At any time the circuit-closer 6 may be automatically held away from the segments by pulling the milled head 18 outward and turning it slightly, so that the pin 17 will recede from the hole 20 and bear against the core 18'.

I claim as my invention—

1. The combination with a commutator, of a circuit-closer, movable into and out of contact with the segments of the commutator, and a device, governed manually and mounted

upon the shaft of said commutator, for controlling said circuit-closer, said device consisting of a handle connected by a rod to the said circuit-closer, and having a hole therein, and adapted to turn upon said rod relatively to said shaft, a pin carried on the shaft and located to fit into the said hole in predetermined positions, and a spring tending to press said circuit-closer against said segments.

2. The combination with a commutator, of a conductor adapted to come into contact with the segments of the commutator, a handle, rotatable relatively to the commutator, for moving the conductor away from the commutator, and means for locking the said handle to said shaft in the "on" and "off" positions.

3. The combination with a commutator having an inner conical surface, a conducting-cone bearing upon said surface, a pin passing into the cone and extending through an oval hole in the shaft of the commutator, a rod through which the said pin also extends, and located in a different hole in the shaft, said rod having a head for a handle and made in two parts, 9 and 10, of different diameters, and a helical spring around the smaller part and having one end bearing against the larger part, the other end bearing against a plug 16, in the shaft for forming a bearing for the smaller part of said rod.

4. The combination with a commutator, of a circuit-closer, movable into and out of contact with the segments of the commutator, and a device, governed manually and mounted upon the shaft of said commutator, for controlling said circuit-closer, said device consisting of a handle 18, having a hole 20, and rotary relatively to said shaft, a rod connecting the handle to the circuit-closer and extending through a hole in the shaft, a cap through which the rod passes, fixed into the end of the shaft, and carrying a projecting pin 17, for fitting into the said hole 20, and a spring having one end bearing upon the cap, and the other end pressing longitudinally along and against said rod, substantially as and for the purpose described.

Signed this 14th day of June, 1898.

EDWARD C. NEWCOMB. [L. S.]

Witnesses:

ALFRED P. WATERMAN,
ALBERT POLLARD.