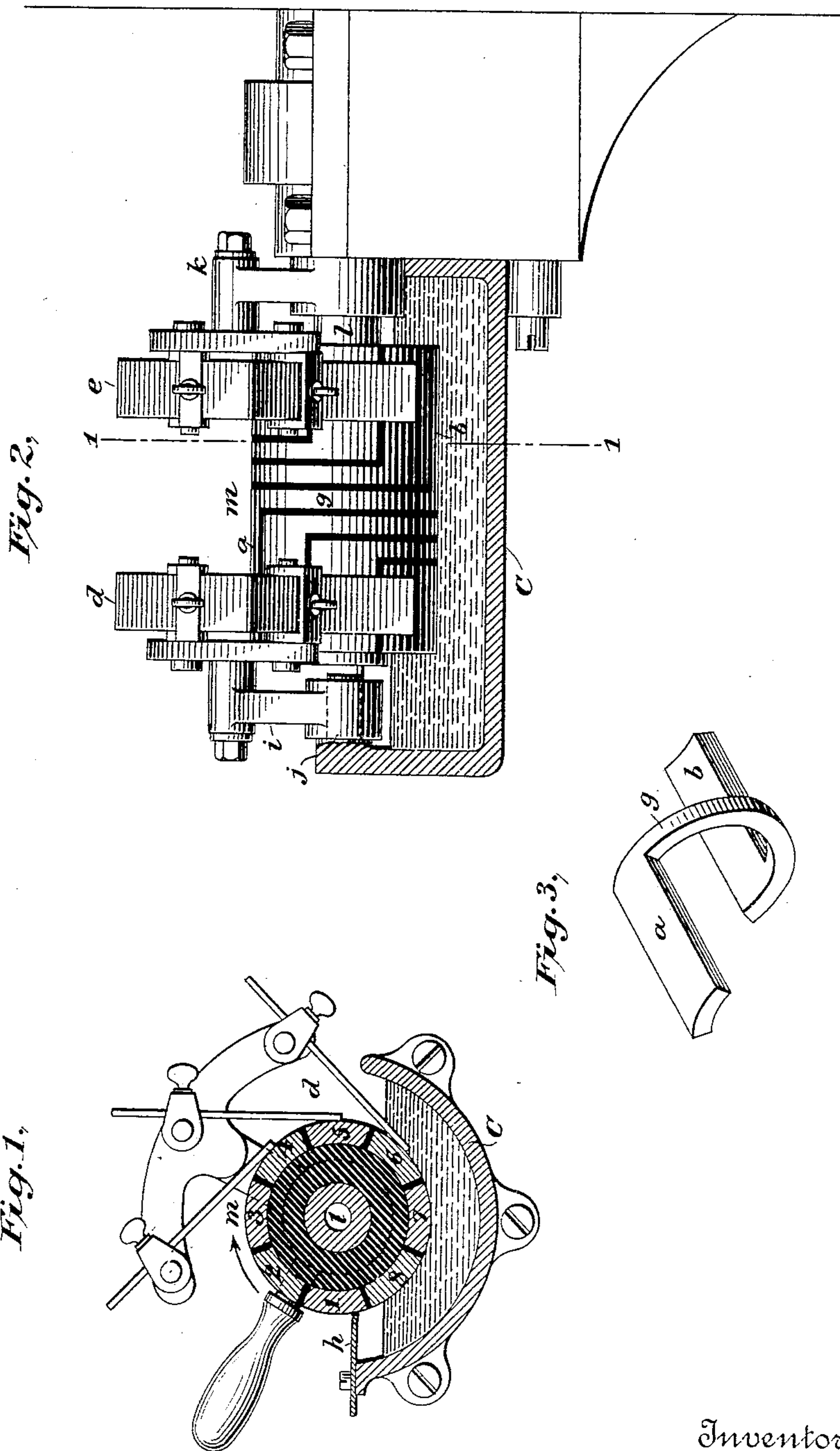


(No Model.)

C. L. BUCKINGHAM.
COMMUTATOR.

No. 394,095.

Patented Dec. 4, 1888.



Witnesses.

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UNITED STATES PATENT OFFICE.

CHARLES L. BUCKINGHAM, OF NEW YORK, N. Y.

COMMUTATOR.

SPECIFICATION forming part of Letters Patent No. 394,095, dated December 4, 1888.

Application filed October 5, 1888. Serial No. 287,327. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. BUCKINGHAM, of the city, county, and State of New York, a citizen of the United States of America, have made a new and useful Improvement in Dynamo-Machines, its purpose being to avoid flashing at the commutator, which usually occurs when the machine is taxed to near its full generative capacity, of which the following is a specification.

Others have heretofore submerged the rotary commutator in a reservoir of oil to overcome this difficulty; but in such arrangements the leakage of oil from the reservoir through the journal-bearing is a serious objection. With my improvement I avoid submerging the entire commutator, and do not even raise the oil to the level of the lower side of the shaft.

In commutators as ordinarily constructed there are a rotating hub and two brushes placed opposite each other for collecting current; but in such construction, if oil were used, its level would have to be raised to cover the ends of both brushes, and consequently above the center of the journal. I, however, propose to employ a commutator whose strips are so arranged that brushes arranged in the same angular position will make contact with diametrically-opposite coils of the armature. By thus constructing the commutator, instead of placing the brushes on opposite sides of the commutator, they may both be placed in the same angular position, and both may make contact with the commutator at the lowest point of rotation, thereby necessitating only the use of oil enough to cover a very small part of its peripheral surface.

Figure 1 represents an end sectional view of my improvement as applied to the open-circuit machine upon which four coils are employed, there being two commutator-strips arranged diametrically opposite each other for each coil to which its ends are respectively joined. Fig. 2 represents a side view of the same device, partly in section. Fig. 3 represents a single commutator-strip.

In Fig. 1, *m* is a commutator-hub, the strips or sections being numbered from one to eight, as shown, and each strip has at each end of the hub a wearing-section; but the two sec-

tions are arranged diametrically opposite each other, and are electrically joined together, as shown in Fig. 3.

d and *e* are commutator-brushes, each having three strips electrically joined together, thereby affording a continuous contact upon the commutator of about three-eighths of a circle. The free ends of each coil are joined, respectively, to diametrically-opposite commutator-strips. Thus the outer ends of one armature-coil are respectively joined to sections 1 and 5 of the commutator. It will now be seen that while one end of the coil is in contact with brush *e* through section 1 the other end of the coil is in connection with brush *d* through section 5. As shown in Fig. 1, a circuit through the armature from the positive to the negative pole is formed through brush *e*, commutator-sections 1 2 3, the three corresponding armature-coils in multiple arc, commutator-sections 5 6 7, and brush *d*. By this arrangement the armature-coils are joined with the brushes precisely as though the brushes were used on opposite sides of the commutator, for if the brush *d* were transferred along the shaft and placed opposite brush *e* it would occupy the same position in respect to the coils of the armature. With the commutator-strips made as shown in Figs. 2 and 3 brushes *d* and *e* may be made to occupy the same angular position one with the other, and only oil enough need be placed in reservoir *c* to cover the range of contact between said brushes and hub, and it is not necessary that the entire section of contact be covered, for, as is well known, if the commutator be rotated in the direction indicated by the arrow, the tendency will be for the spark to be drawn almost entirely from the lower strip of each brush, wherefore it is only this part that requires to be covered with oil. In case of commutators where only a single-strip brush is used and contact is confined to a single line parallel with the axis, as in the Gramme or Alleneck, it is even less important that more than a small part of the hub be submerged.

To prevent oil from being thrown out of the reservoir by the rapid rotation of the commutator, a shield, *h*, of insulating material, also serving as a scraper, is employed, which

rests lightly upon the hub at a level near the top of the reservoir.

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

- 5 1. As a means for preventing flashing in dynamo-machines, the combination of a commutator-hub, an oil-reservoir, and two brushes occupying the same or substantially the same angular position.

2. As a means of preventing flashing, the combination of a commutator and brushes and an oil-reservoir holding only sufficient oil to cover the points of contact between the brushes and commutators.

CHARLES L. BUCKINGHAM.

Witnesses:

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