

(No Model.)

C. W. & L. B. ATKINSON.
DYNAMO ELECTRIC GENERATOR OR MOTOR.

No. 471,691.

Patented Mar. 29, 1892.

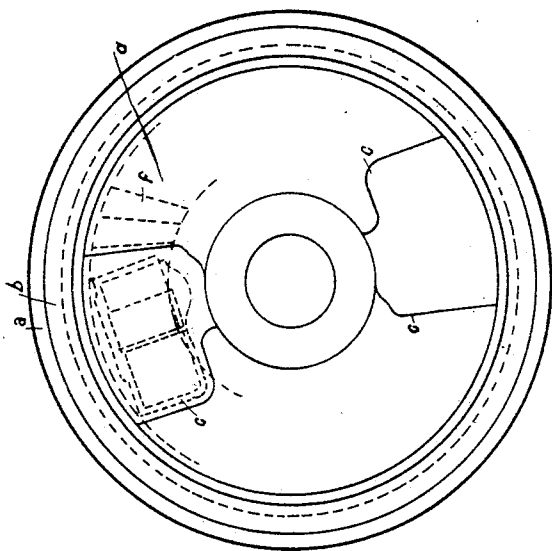


FIG. 2.

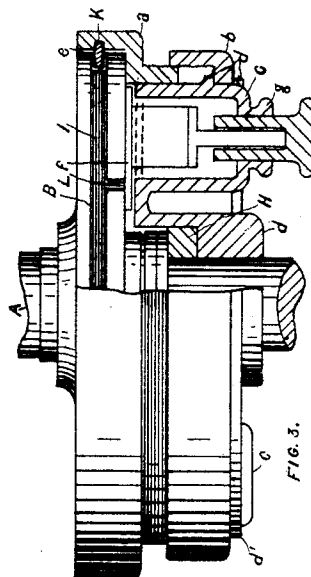


FIG. 3.

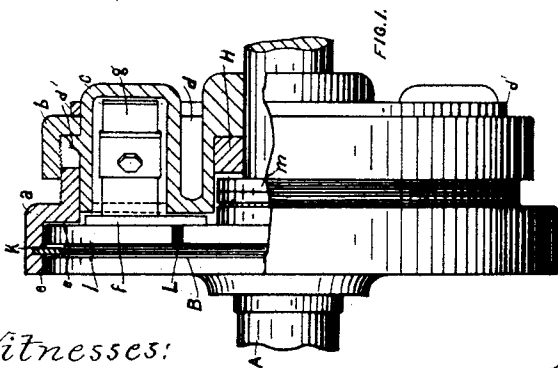


FIG. 1.

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UNITED STATES PATENT OFFICE.

CLAUDE WILLIAM ATKINSON AND LLEWELYN B. ATKINSON, OF LONDON,
ENGLAND.

DYNAMO-ELECTRIC GENERATOR OR MOTOR.

SPECIFICATION forming part of Letters Patent No. 471,691, dated March 29, 1892.

Application filed August 18, 1891. Serial No. 403,024. (No model.) Patented in England January 10, 1891, No. 536, and in France November 3, 1891, No. 214,743.

To all whom it may concern:

Be it known that we, CLAUDE WILLIAM ATKINSON and LLEWELYN BIRCHALL ATKINSON, residing at London, England, have invented an Improvement in Dynamo-Electric Generators and Motors, (which has been patented to us in Great Britain under No. 536 and date January 10, 1891, and in France November 3, 1891, No. 214,743,) of which the following is a specification.

This invention relates to improvements in dynamo-electric generators and motors, and has for its object in general the provision of means for inclosing the brushes and commutators of such machines, so as to render them suitable for working in the presence of inflammable or explosive atmospheres, and in particular to improvements in the arrangement and construction of the commutator and brushes by which the brushes and commutator are inclosed within a casing in such a manner as to prevent any ignition of the explosive atmosphere being effected from the interior by the sparking of the brushes.

In the ordinary arrangement of commutator and brushes it has been found that the wearing of the commutator during continuous working effects a considerable change of volume in the space within the inclosing chamber, so much so that should the gaseous contents of the inclosed chamber explode the explosion might be communicated to the atmosphere.

In order that our invention may be the better understood, we now proceed to describe the same in relation to the drawings hereunto annexed, reference being had to the letters marked thereon.

Like letters refer to like parts in the various figures.

Figure 1 is a part sectional view of commutator, brushes, and the casing around them. Fig. 2 is an end view of the casing, showing the position of one brush dotted in. Fig. 3 is a modified arrangement having a butt-brush.

We carry out our invention as follows: In Fig. 1, A is the shaft of the dynamo or motor, upon which is rigidly attached a facial commutator B, upon the face of which the con-

tact-strips *f* are attached, these latter being connected in the usual way to the various coils of the armature. Upon the bearing carrying the shaft A, or preferably upon the shaft itself, is loosely mounted a casing *d*, having circular rings *d'*, between which is arranged a screwed ring *b*, which engages with a further ring *a*, a part of which lies in close proximity to the periphery of the commutator. The air-space *e*, existant between the rotating commutator and the stationary casing, must of necessity be as small as possible, in order that any explosion of gases within the casing shall not be communicated to the outside.

Upon the casing *d* we arrange two or more excrescences or boxes C, within which the brushes *g* are situated and fixed. The space existing between the shaft or bush and the casing may be filled up by wood, vulcanite, or similar material H, which can be cut away as desired. The necessity of the cutting of this material will be hereinafter more fully described. The casing may be prevented from rotation by being either detachably attached to the bush of the bearing or the pedestal. As the space available in such an arrangement of commutator is very limited with regard to the disposition of the brushes, we prefer to arrange the commutator-strips *f* tangentially, so as to enable the brushes to be disposed within the casing and to make contact with the commutator in the usual manner. We can, however, arrange the strips radially where desirable.

As the commutator wears it becomes necessary to move the case carrying the brushes nearer to the commutator. The object of moving the whole case to the commutator, rather than moving the brushes carried within the case toward the commutator, is to keep the volume of gas contained within the casing *d* as small as possible. This adjustment we effect by means of the union nut *b*, which by its screw engagement with the casing A, draws the casing *d*, by means of the rings *d'*, nearer to or farther from the commutator B, in accordance as to whether it is screwed on or off. The material H, which fills the space between the casing and the shaft, may be cut away should the left-hand face come in contact

with the commutator-nuts *m* when the casing is screwed up toward the face of the commutator.

In order to prevent the casing *d* from being removed when the machine is running, and thus allow any sparking at the commutator to ignite any surrounding inflammable or explosive atmosphere, we provide the commutator *B* with a locking-catch, which fastens the casing *a* to it when the machine is running. This fastening consists of a groove *I*, formed around the periphery of the commutator *B*, into which engage two or more studs *K*, situated on the casing *a*. Passages *L* are arranged leading from the groove to the outside face of the commutator. The position of such passages *L* correspond to the position of the studs *K*, so that when the machine is not in rotation the casing *a* is removed by making the passages *L* register with the studs *K*, thus allowing the studs *K* to be withdrawn from the groove *I*.

Fig. 3 shows a modified arrangement of casing adapted to carry a butt-brush. It is quite obvious that this casing may be used in conjunction with the main casing surrounding the armature, as described in Figs. 1 and 2 of an accompanying application, filed August 15, 1891, Serial No. 403,072. The joint between the armature-casing and the commutator-casing may be made by means of a flange or in any other equivalent manner.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is—

1. In a dynamo-electric generator or motor, the combination of a commutator having

contact-strips on its face at or about at right angles to the axis of rotation, with a casing adjustably attached to the framing of the machine carrying the brushes, the said casing being capable of adjustment toward the face of the commutator to compensate for wear and maintain the smallest volume, the space between the rotating periphery of the commutator and the casing being as small as possible and of such a length as to prevent the passage of flame.

2. In a dynamo-electric generator or motor provided with a commutator having contact-strips on its face at or about at right angles to the axis of rotation, the combination of the casing carrying the brushes and a union nut, with a casing embracing the periphery of the commutator and connected to the commutator-casing by means of the said union nut, substantially as described.

3. In an inclosed commutator of the character described, a locking-catch fastening the casing to the commutator when the machine is in motion, consisting of a groove around the commutator, having lateral passages leading to the outside, and studs on the casing which engage in the said groove and are so disposed as to allow their withdrawal from the said groove through the said lateral passages.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

CLAUDE WILLIAM ATKINSON.
LLEWELYN B. ATKINSON.

Witnesses:

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CHARLES F. ARROWSMITH.