

947,853.

Fig.1

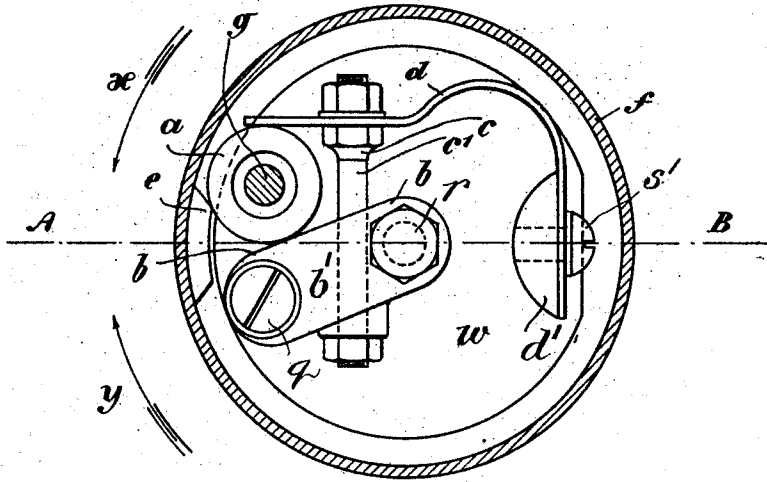
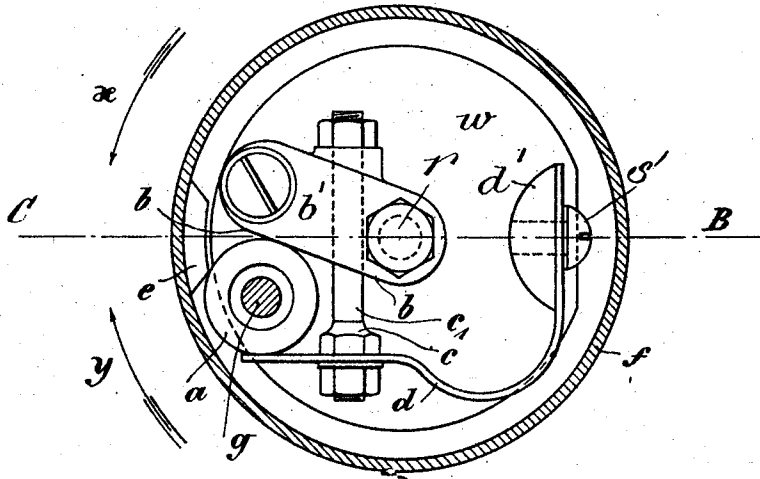


Fig. 2.



Witness:
F. R. Fulton
J. H. Kinsten

Inventor!
Hermann Ruthardt
24 Melken, ¹² am Stettener Str.
his attys.

UNITED STATES PATENT OFFICE.

HERMANN RUTHARDT, OF STUTTGART, GERMANY.

ROTARY CURRENT-BREAKER.

947,853.

Specification of Letters Patent.

Patented Feb. 1, 1910.

Application filed September 4, 1908. Serial No. 451,748.

To all whom it may concern:

Be it known that I, HERMANN RUTHARDT, a subject of the German Emperor, residing at Stuttgart, Germany, have invented a certain new and useful Improved Rotary Current-Breaker, of which the following is a specification.

This invention relates to a rotary current breaker for use with magneto-electric igniting apparatus, in which it serves the known purpose of interrupting the current in the armature winding—previously completed or made by the breaker—thereby setting up, by self-induction, a current of such high tension that a spark adapted for igniting a gaseous mixture, can be formed between the ends of a suitable sparking plug.

In high speed rotary breakers it is very important that the parts by means of which the breaking of the current is effected should not be subjected to any injurious friction that would necessitate lubricating, and that the apparatus should be constructed in such a manner as to work as noiselessly as possible, because the life of the moving parts will be thus increased.

In breakers with rocking levers, the pivots wear out in a comparatively short time, because lubrication can only be effected while the apparatus is at rest; and for the same reason the apparatus cannot work without noise. Other forms of apparatus again, in which an attempt is made to dispense with lubrication by the use of knife-edge bearings, are attended with the drawback that the knife edges are injured by the sparks formed when the current is broken. These and similar defects are avoided according to the present invention, one form of which is set out in the accompanying drawing in which:—

Figure 1 is a section of the breaker, taken through the case, which carries the strikers or lugs and which case though fixed in operation is capable of rotation in the usual way for the purpose of advancing or retarding the spark. Fig. 2 is another view to show the symmetrical arrangement of the apparatus illustrated by its position when turned over around the axial line A—B, in which case it is best adapted for motion in the opposite direction.

The current breaking part shown consists of a roller *a*, which loosely surrounds a pin *g* and which roller is arranged between an

inclined plane *b*, *b* and a spring *d* carrying a contact stud *c*. The plane *b*, *b* is formed by the edge of a bar *b'* secured to the central rotatable part *w* as at *r*. Under the influence of the spring *d* (which is also attached to the part *w*, or through a screw *s'* to a lug *d'* on same) and the centrifugal force, the roller *a*, which follows the movement of rotation of the part *w* of the breaker, tends usually to assume a constant extreme position, which effort is interrupted, at each revolution by contact with a lug *e* arranged inside the case *f* which is as stated fixed in operation, though it is movable for adjustment as usual. The bar *b'* carries a contact post or stud *c'* in contact with the stud *c*. By the rolling inward of the roller along the inclined plane *b*, *b*, the spring *d*, is raised so that the contact between *c* and *c'* is broken, and the requisite powerful induction current for ignition is set up in the armature. On passing away from the lug, the roller returns automatically to its constant or normal position, and thereby the circuit between *c* and *c'* is remade without noise.

There is a considerable free space left between the pin *g* and roller *a* as shown and thus serves for preventing axial movements and for limiting the constant extreme position, so that no injurious friction can be generated anywhere and lubrication is rendered superfluous. When the roller is in its extreme outward normal position as attained by the centrifugal force, but which position is not shown, a certain amount of space will be left between the spring and the periphery of the roller so that no injurious movement of or action on the spring contact will take place.

From the foregoing it is evident that, owing to the absence of any injurious friction, the apparatus can be worked without any lubrication; and this is the more important because in lubrication, oil gets on to the contacts, a condition that should be prevented, as it gives rise to trouble in working.

The arrangement of the roller also results in another advantage in respect of uniformity of manufacture. Although the roller is able to work when the breaker, or armature, is running in either direction, the direction of rotation indicated by the arrow *a* is preferable, since the roller runs on the inclined plane in a theoretically correct man-

ner, which is not the case when the direction of rotation is that indicated by y . Therefore in order to enable all parts of the breaker to be effectively used when the armature is rotating in the direction indicated by the arrow y it is necessary to turn the device about its central axis into the position shown in Fig. 2, the parts being so arranged that the roller a then rolls in a theoretically correct manner on the inclined plane b, b .

Owing to the large quantities in which these igniters are made, this arrangement offers valuable advantages enabling production to be simplified and cheapened.

What I claim is:—

1. In a current breaker, and in combination two parts, one of which is capable of rotation, a roller, and a part having an inclined plane carried by the rotatable part, a spring carrying a contact also carried by said part, and between a part of which spring and the inclined plane the roller can roll, a second contact carried by the rotatable part, and a lug carried by the other part and adapted to project into the normal path of the roller.

2. In a current breaker, and in combination, an inner part capable of rotation, a roller, and a part having an inclined plane carried by the rotatable part, a spring carrying a contact also carried by said part, and between a part of which spring and the inclined plane the roller can roll, a second contact carried by the rotatable part, an outer part in the form of a ring surrounding the inner; and a lug carried by said outer part, the distance of said outer part from the inner allowing the roller while in its normal path

due to centrifugal action to be free of the contact spring.

3. In a current breaker, and in combination an inner part capable of rotation, a loose roller, and a pin carried by said inner part and adapted to limit the movement of said roller, a part having an inclined plane carried by the rotatable part, a spring carrying a contact also carried by said part, and between a part of which spring and the inclined plane the roller can roll, a second contact carried by the rotatable part, an outer part in the form of a ring surrounding the inner part, and a lug carried by said outer part, and adapted to project into the normal path of the roller.

4. In a current breaker, and in combination, an inner and outer part concentrically arranged, the inner being capable of rotation, a roller, and a bar having an inclined plane carried by the inner part, a spring carrying a contact also carried by said part and between a part of which spring and the inclined plane the roller can roll, a second contact carried by the rotatable part, a part of such inclined plane and the spring being located on one side of an axial line central of the device, and a lug carried by the outer part and adapted to project into the normal path of the roller.

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

HERMANN RUTHARDT.

Witnesses:

PAUL WILHELM FUNCK,
MINA REPPLEL.