E. GASSMANN.

ELECTRICAL CIRCUIT BREAKER.

APPLICATION FILED OCT. 31, 1913.

**1,121,996.** Patented Dec. 22, 1914.

Fig. 1.

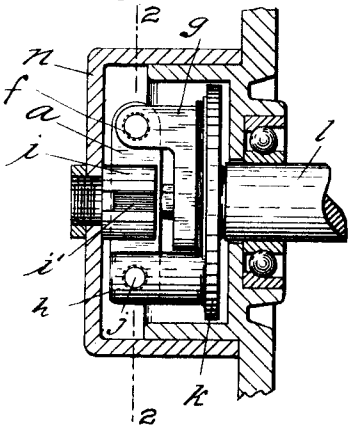
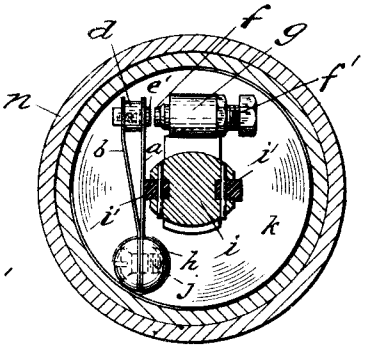



Fig. 2.



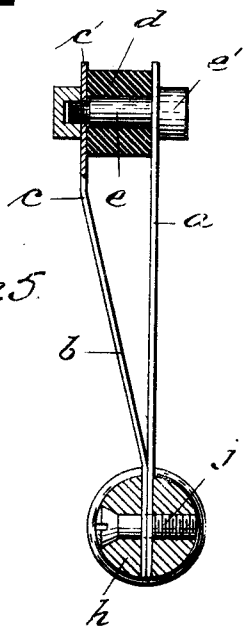




Fig. 5.

Fig. 3.

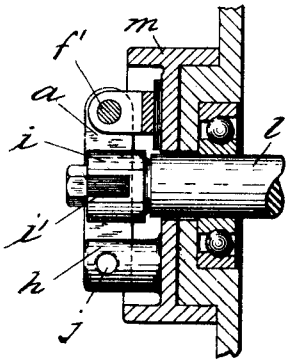
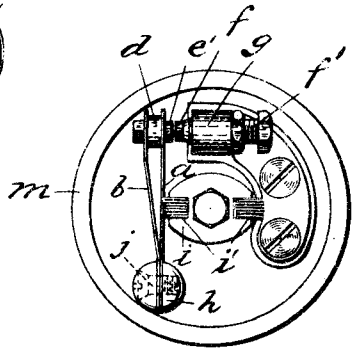



Fig. 4.

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# UNITED STATES PATENT OFFICE.

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## ELECTRICAL-CIRCUIT BREAKER.

1,121,996. Specification of Letters Patent. Patented Dec. 22, 1914.

Application filed October 31, 1913. Serial No. 798,527.

*To all whom it may concern:*

Be it known that I, EUGENE GASSMANN, a citizen of Germany, and a resident of the borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Electrical-Circuit Breakers, of which the following is a complete specification.

This invention relates to electrical ignition devices, and other apparatus, in which the flow of electrical current is periodically interrupted, and consists of the herein shown and described mechanically operatable interrupter.

Circuit breakers, or interrupters, employed in apparatus of this kind are usually composed of two contacts, of which one is stationary and the other movable. The movable contacts are most frequently mounted on springs, set to press the contact against the stationary one, and some means, usually a cam, acts upon the spring to separate the contact, mounted thereon, from the stationary thus "breaking" the circuit. The closing of the contacts is then again effected by the re-action of the spring, whereon the movable contact is mounted. In the present state of the art the contacts of a circuit breaker are usually mounted upon some rotating part, the actuating cam being stationary, or in a stationary casing, the cam (or other actuating device) being then rotated. The condition of efficient operation of electrical circuit breakers is that the contacts should be brought together over the greatest possible part of the area of their surfaces, and that their separation, interrupting the current, should be made instantaneously and simultaneously, and as nearly equi-distantly as possible, in the entire extent of their contact surfaces. The construction of circuit breakers in which the movable contact is mounted on a spring possesses the advantages of simplicity and cheapness, and it is only because of the difficulty to produce springs that will retain their original elasticity and accuracy of reaction that more complicated substitutes, in the shape of bell cranks, moving wedges, etc., were introduced.

The object of my invention is the devising of a plain spring contact circuit breaker, in which the advantages are secured, and the stated defect obviated.

In the accompanying drawing Figure 1 is a sectional view, partly an elevation of a circuit breaker, constructed according to my invention, wherein the contacts are mounted on a disk, fixed to the armature shaft of a magneto, and the cam, acting upon the movable contact is fixed to a stud set in the cover of the casing inclosing the device; Fig. 2 is a cross-sectional view on line 2—2 indicated in Fig. 1; Fig. 3 is a sectional view, partly an elevation of a similarly constructed circuit breaker, in which the contacts are mounted in the stationary casing, and the cam, operating the movable contact, is fixed to the end of the armature shaft and rotates with it; Fig. 4 is a front elevation of the device; Fig. 5 is an enlarged detail, showing the novel and distinguishing feature of my improved circuit breaker in the construction and assemblying of the parts of the movable contact.

This movable contact as shown in Fig. 5 is made up of two springs, *a* and *b*, joined together on both ends, the front spring *a* being straight and the other, *b*, being bent at *c*, a point some distance from the end *c'*; the part *c* to *c'* being parallel, or nearly so, to the spring *a*, and the other part of the spring *b* being deflected from the bend *c* toward the spring *a*. This deflection is more than would be necessary to make the lower ends of both springs meet, and thus, when the ends of the two springs *a* and *b* are clamped together—as, for instance—by the split block *h* the spring *b* is thereby set to press against the spring *a*, and the springs are made to act in unison, though each of them acts, or is utilized to act, in different ways to the same end. The upper ends of the springs *a* and *b* are spaced by the block *d* and are held rigidly united by the screw-bolt or rivet *e*, whose head *e'* is snugly fitted to the point *f* of the stationary contact *g*. The other ends of the two springs *a* and *b* are pressed and rigidly joined together, as for instance, by being clamped in the split block *h* by the screw *j*. This clamping, or otherwise securing together the other ends of the springs *a* and *b* in a fixed point, results in the action of spring *b* being effectively exerted in the direction toward the stationary contact *g*, and to brace and reinforce the action of the spring *a* in that direction. This insures the attaining of the stated condition of an efficient operation of the circuit breaker,

whether the surfaces of the contact points, that is, of the head $e'$ of the screw-bolt $e$ and of the end $f$ of screw $f'$ are flat, or one pointed and the other correspondingly concaved to increase the area of the contact surface, and eliminates the rendering of the circuit breaker ineffective by a deflection or weakening of the spring.

The points $i'$ of the cam $i$, abutting against the spring $a$, move the contact point $e'$ from the point $f$. This action takes place whether the disk $k$, whereon the contacts are mounted, rotates, and the cam $i$ is fixed in the cover $n$ of the casing, (see Figs. 1 and 2) or whether the cam is mounted on the armature shaft $l$, and the contacts in the stationary casing $m$ as shown in Figs. 3 and 4. This action of the cam points $i'$ will not have the usual detrimental effect upon the spring $a$, inasmuch as the springs $a$ and $b$ are longitudinally immovable in relation to each other, and the spring $a$ is, so to say, held taut by the spring $b$, and thus cannot be bent, the strain of the cam upon it being correspondingly transferred upon the spring $b$, as the strain upon the string is taken up by a bow. The springs $a$ and $b$ thus co-act and the result of this their co-acting and co-resisting force is that the separating of the contact points is effected instantaneously and also simultaneously over the entire area of the contact surfaces; the movable contact surface is not brought into an angular position, relatively to the contact surface of the stationary contact, the contact surfaces being held, by the co-action of the springs, at all times, in a position parallel to each other, *ergo* equi-distantly separated from each other in all points. When the cam points pass, the contact points are again brought together, the movable contact moving in the same path though reversely, to close the electrical circuit.

The cam points $i'$ are preferably blocks of compressed fibrous material or leather, and as the closing of the contacts proceed in the same way as their opening the operation of the circuit breaker, constructed according to my invention is practically noiseless, the wearing out of the contacts is avoided and there are no parts requiring to be lubricated. Practical experience has demonstrated that a circuit breaker thus constructed, is practically indestructible, and infallible in operation.

I claim as my invention:

1. A movable contact for electrical circuit breakers comprising a flexible arm made up of one straight, and one bent spring, the springs being joined to a spacing block on one end and their other ends clamped together and in a fixed position; a contact point affixed thereto on the free end; substantially as herein shown and described.

2. An electrical circuit breaker, comprising a stationary contact, a fixed clamp, a flexible arm made up of one straight and one bent spring, the ends of the two springs being held closely together and in fixed position in the clamp; a spacing block secured between the free ends of the springs; a movable contact mounted on the free end of the flexible arm, the flexible arm being set to press the contact, secured thereto, against the stationary contact, and means acting upon the flexible arm to move the contact, mounted thereon, away from the stationary contact; substantially as herein shown and described.

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