

F. E. LIND.
 ROTARY CIRCUIT CLOSER.
 APPLICATION FILED JULY 9, 1908.

914,435.

Patented Mar. 9, 1909.

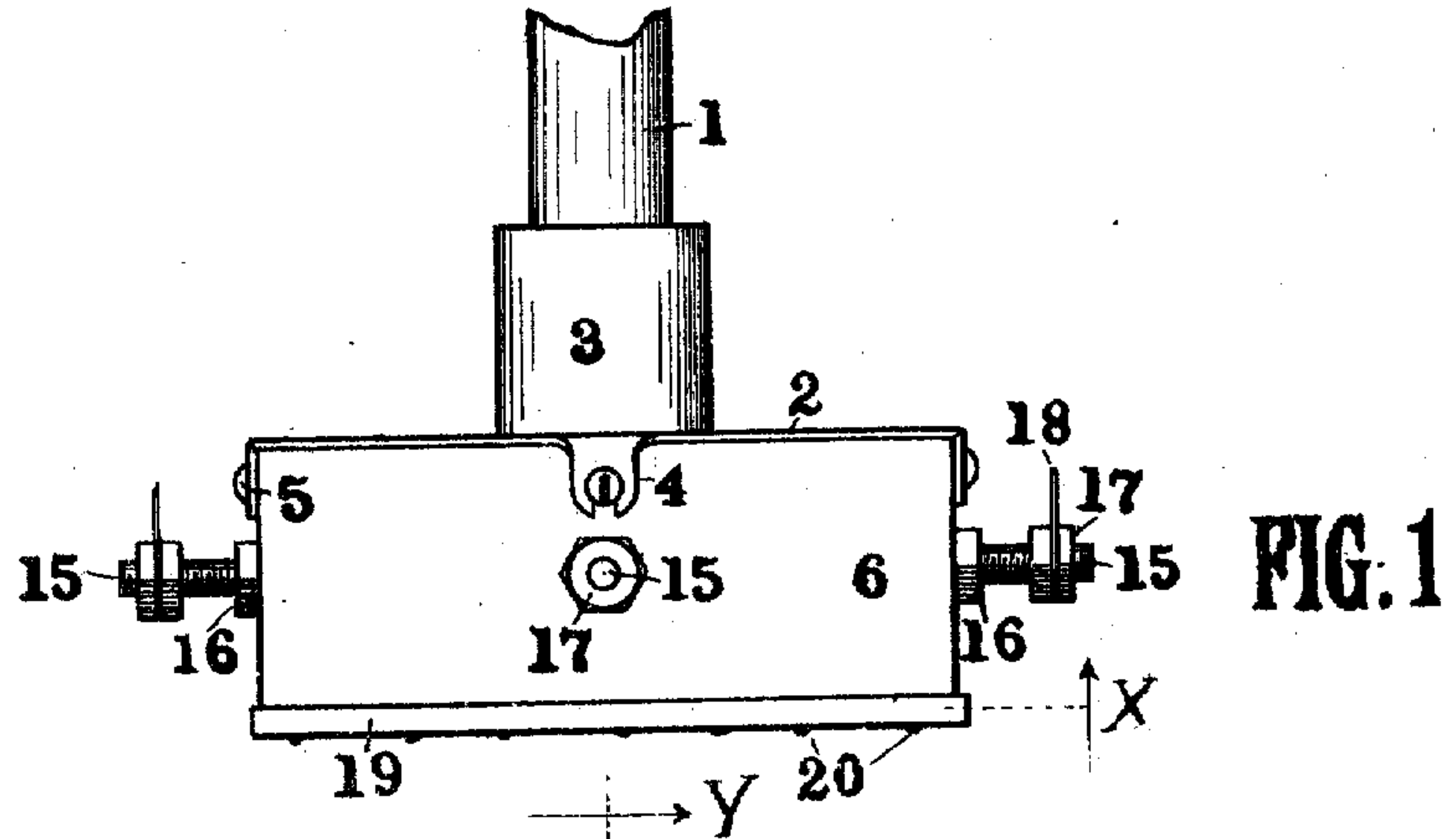


FIG. 2

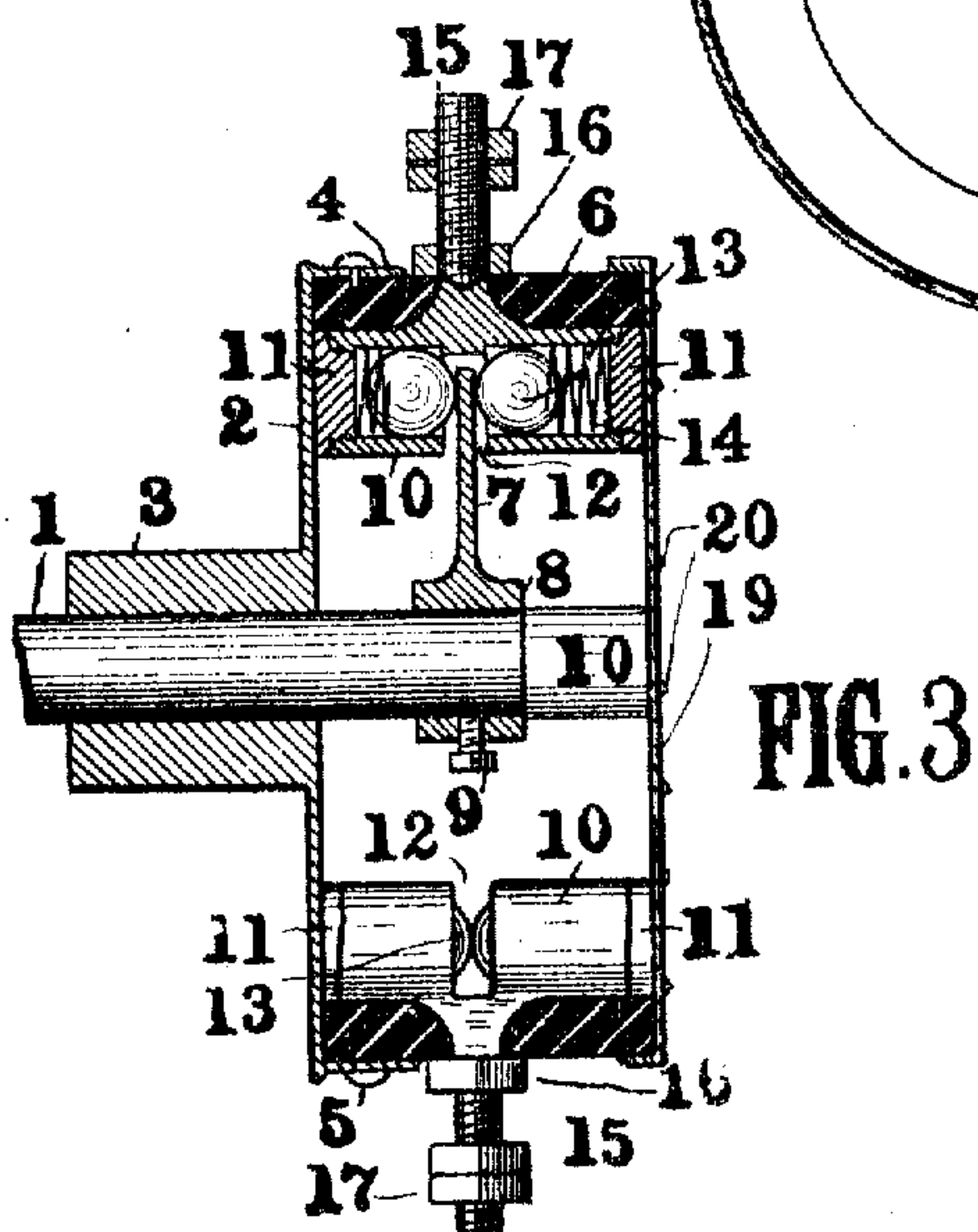
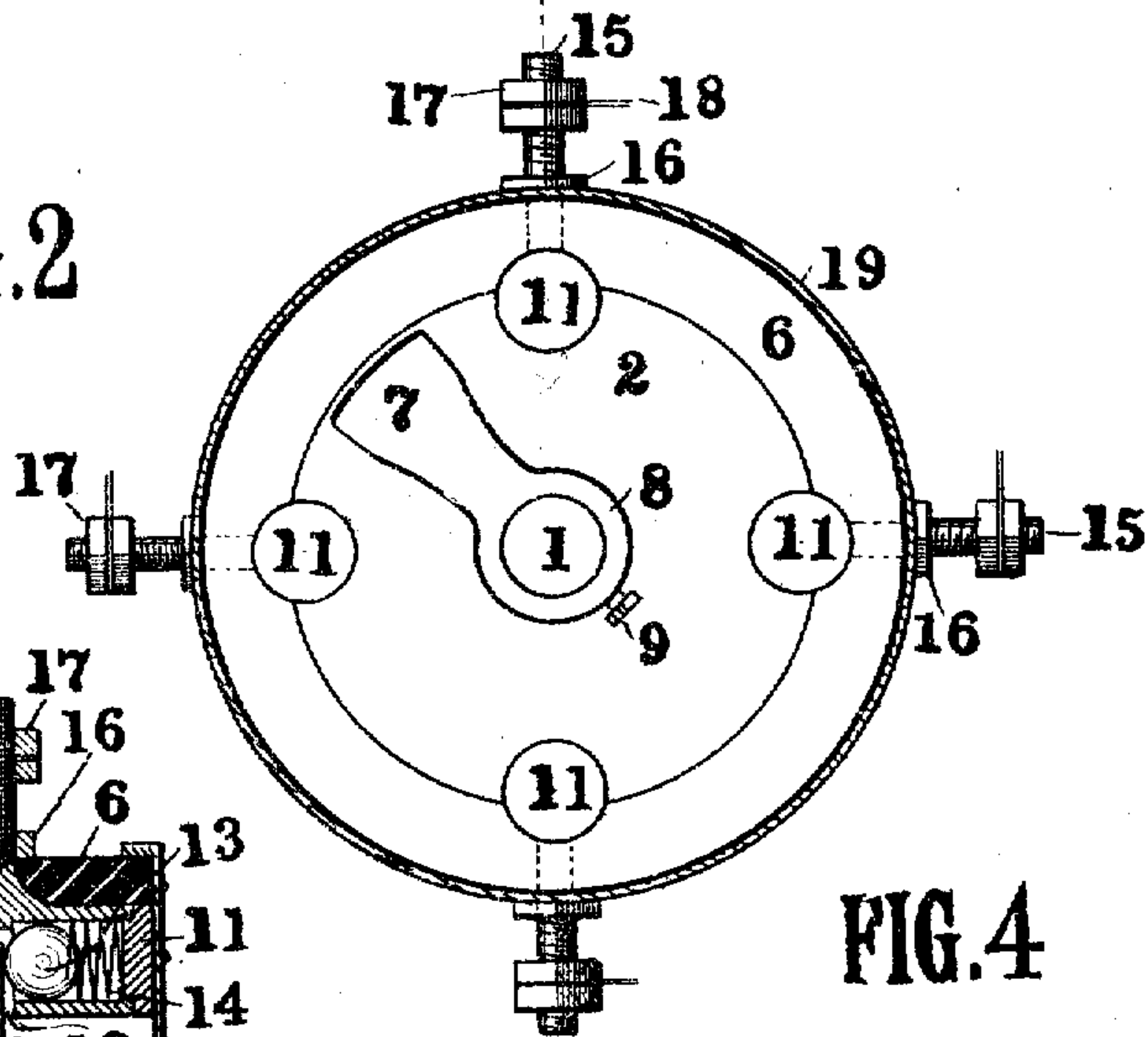
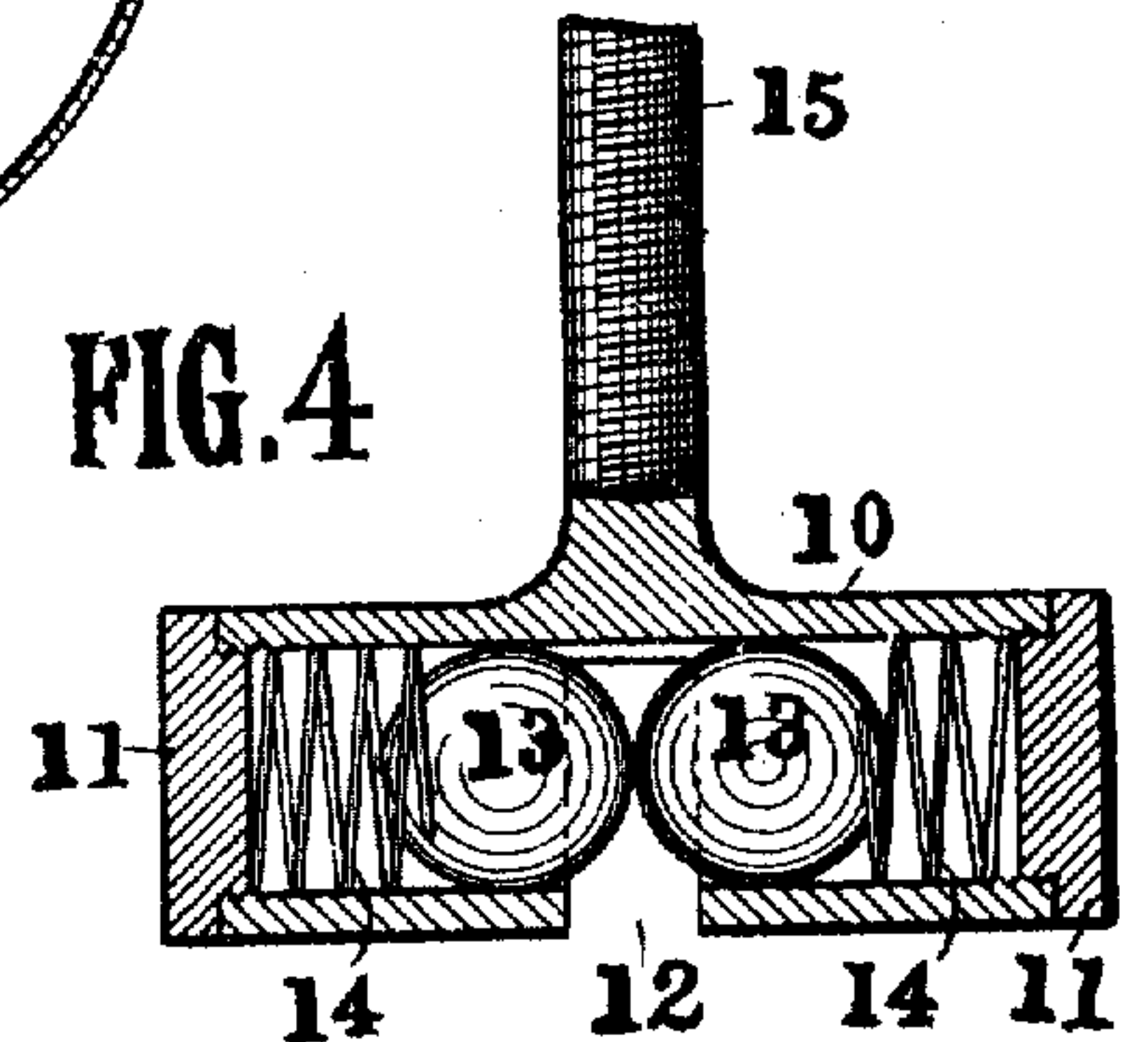


FIG. 3

FIG. 4



WITNESSES

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ROTARY CIRCUIT-CLOSER.

No. 914,435.

Specification of Letters Patent.

Patented March 9, 1909.

Application filed July 9, 1908. Serial No. 442,786.

To all whom it may concern:

Be it known that I, FRANK E. LIND, a citizen of the United States, residing at Kent, in the county of Portage and State of Ohio, have invented new and useful Improvements in Rotary Circuit-Closers, of which the following is a specification.

This invention relates to rotary circuit closers such as are used in connection with internal combustion engines for the purpose of forming sparks between electrodes and thereby firing charges of explosive mixture at determinate intervals and the objects thereof are to produce a circuit maker and breaker applicable to engines of the foregoing type, which will be simple in construction and highly efficient and durable in use.

A further object of this invention is to provide a device of the class named especially adapted for multiple explosion engines wherein the electric contact is positively made and quickly broken and without any force or strain tending to injure the structure.

A still further object of this invention is to provide contact members arranged to engage a rotary contact member of such a type that the friction incident to the making and breaking of the electric circuit is reduced to a minimum.

With the foregoing and other objects in view, the invention consists in the novel construction, combination and arrangement of parts constituting the invention to be hereinafter referred to and illustrated in the accompanying drawings which form a part of this specification wherein is shown the preferred embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In the drawings, in which similar reference numerals indicate like parts in the different figures: Figure 1 is a plan of my improved device. Fig. 2 is a sectional view on line X of Fig. 1. Fig. 3 is a sectional view on line Y of Fig. 2; and, Fig. 4 an enlarged detail of one of the contact members.

Referring specifically to the drawings, 1 is the driving shaft of the rotary circuit closer which is connected by gearing or otherwise to the engine to be fired so as to insure rotation of the contact device at a speed commensurate with the engine. Mount-

ed loosely on the shaft 1 is a supporting plate 2 preferably provided with a central hub 3 and further provided with a plurality of forwardly-projecting slotted ears 4 through which extend holdfast devices 5 by which a ring 6 of insulating material such as vulcanized fiber is held in position. The plate 2 serves to close one end of the opening formed by the ring 6 and the opposite end is closed by a cap 19 held removably in position by means of holdfast devices 20, thus preventing the entrance of dust, dirt and other foreign matters to the mechanism hereinafter described. Mounted on and adapted to revolve with the shaft 1 is a brush 7 having a hub 8 secured on the shaft by means of a set screw 9 and constituting one member of the circuit breaker.

Mounted on the ring 6 are a plurality of members, each containing suitable mechanism for contacting with the revolving brush 7 in making or breaking an electric circuit. These members each comprise a tubular head 10 the ends of which are preferably closed by some means such as threaded caps 11 engaging interiorly-arranged threads in the ends of the head 10. The head 10 of each of said members is provided with a slot 12 extending transversely therethrough. Mounted in the head 10 are a pair of spherical bodies 13 adapted to be forced into contacting relation with each other by means of coiled springs 14 so arranged that the spherical bodies 13 project into the slot 12 and there contact with each other. Extending rearwardly from each of the heads 10 is a threaded shank 15 which passes through a suitable aperture in the insulating ring 6 and is there held in position by means of a nut 16. The outer ends of each of the shanks 15 also bear a pair of nuts 17 for holding the ends of wires 18 used for conducting an electrical current. The springs 14 constantly force the two spherical bodies into contact with each other and as the brush 7 revolves it passes through the slots 12 in the members 10 and forces apart the two spherical bodies in each and forms therewith an electric contact which is broken the instant the brush passes. Any number of contact members 10 may be employed, depending entirely upon the number of explosions required in the engine used in connection herewith and these members may also be placed at any desired point in the interior of the insulating ring 6 so that the time of

closing the electric circuit by which the firing of the explosive mixture contained in the engine may be properly regulated.

It will be apparent that the brush 7 easily forces apart the spherical bodies 13 and as they partially rotate on their axes their rotary motion reduces the friction incident to their contact with the brush 7, and yet a sufficient pressure is afforded by the springs 14 to cause these bodies to insure electrical connection with the brush 7.

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

1. A rotary circuit closer comprising a rotatable shaft, a radial arm carried by said shaft, an annularly-formed insulating member surrounding said shaft, a contact member carried by said annular member arranged in the path of movement of said radial arm, said contact member comprising a tubular head provided with a transverse opening through which said radial arm passes, a pair of balls in said tubular head normally adapted to contact in said opening, resilient elements for causing normal engagement thereof in said opening, whereby said balls will be engaged and forced apart by said radial arm and form an electrical connection therewith during its rotation.

2. The combination in a device of the class described, of an annulus composed of insulating material, a contact member mounted on said annulus comprising a tubular head projecting into the interior thereof, said head portion provided with a transverse slot, spherical bodies mounted in said head, means for causing said spherical bodies to contact within the lines of said slot, and a contact maker revolving within said annulus adapted to pass through said slot and form an electrical connection with said spherical bodies.

3. In a rotary circuit closer, the combina-

tion with a rotatable contact maker, of an annulus composed of insulating material surrounding and axially positioned with respect to said contact maker and a cooperating contact member carried by said annulus comprising a tubular head provided with a transverse slot through which said rotatable member passes, spherical bodies positioned in said head and contacting in said slot, resilient elements for forcing said spherical bodies into contact with each other, the line of contact between said spherical bodies coinciding with the path of movement of said rotatable contact maker whereby said spherical bodies are forced apart and into an electrical connection with said rotatable contact maker during the revolution thereof.

4. In a rotary circuit closer, the combination with a rotatable contact maker, of a suitably-supported annulus of insulating material arranged axially with respect to said contact maker and a cooperating contact member comprising a shank to project through a suitable aperture in said annulus for supporting the latter in position, and a head portion provided with a transverse slot through which said rotatable contact maker passes, spherical bodies mounted in said head arranged to be normally held in contact with each other, their point of contact being in said slot and in the path of movement of said rotatable contact maker whereby said spherical bodies are forced apart and into electrical connection with said rotatable contact maker during the revolution thereof.

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

FRANK E. LIND.

Witnesses:

C. E. HUMPHREY,
GLENARA FOX.