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P. H. PIERCE ET AL
ROTARY MERCURY INTERRUPTER
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Fig. 1

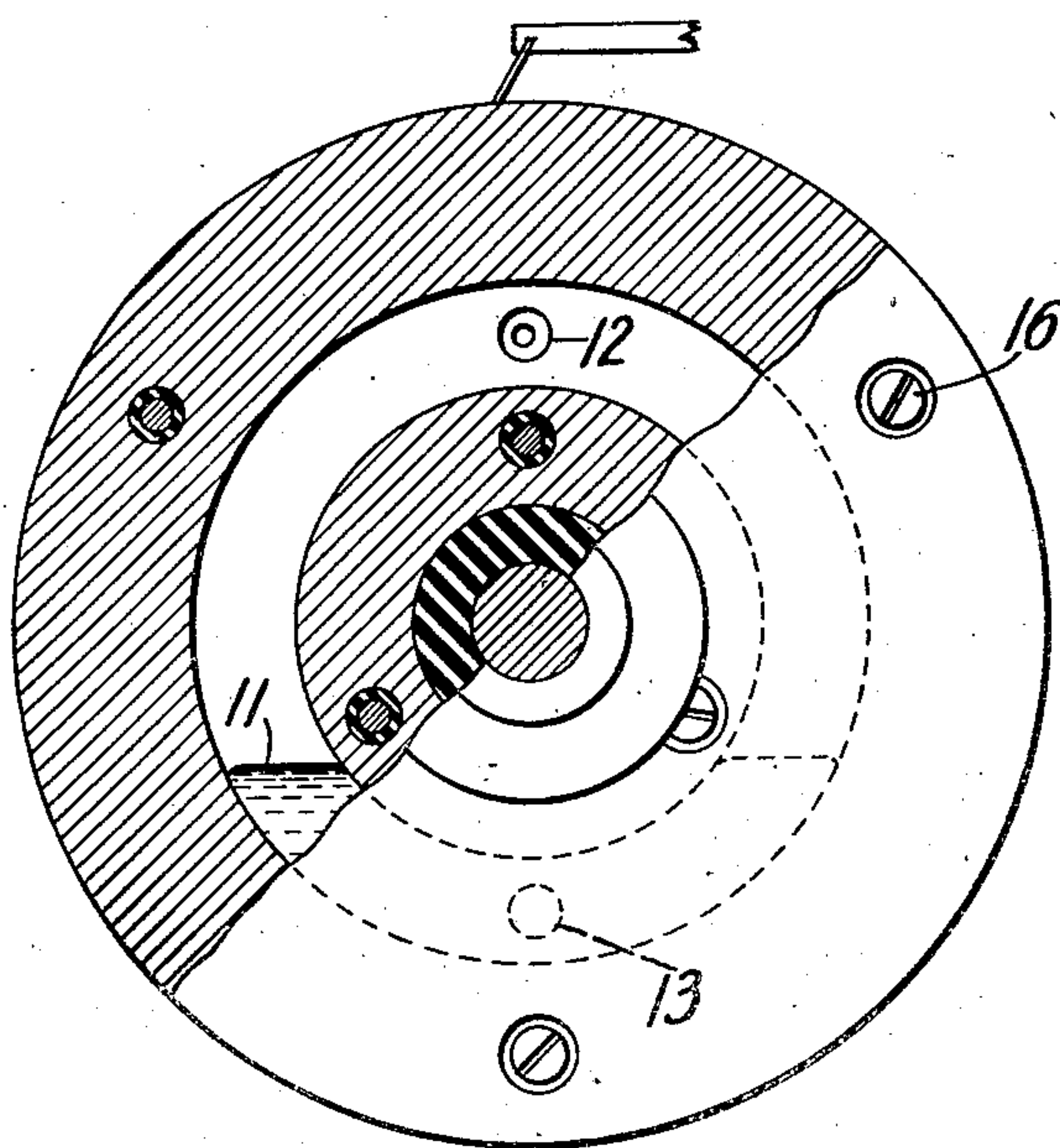
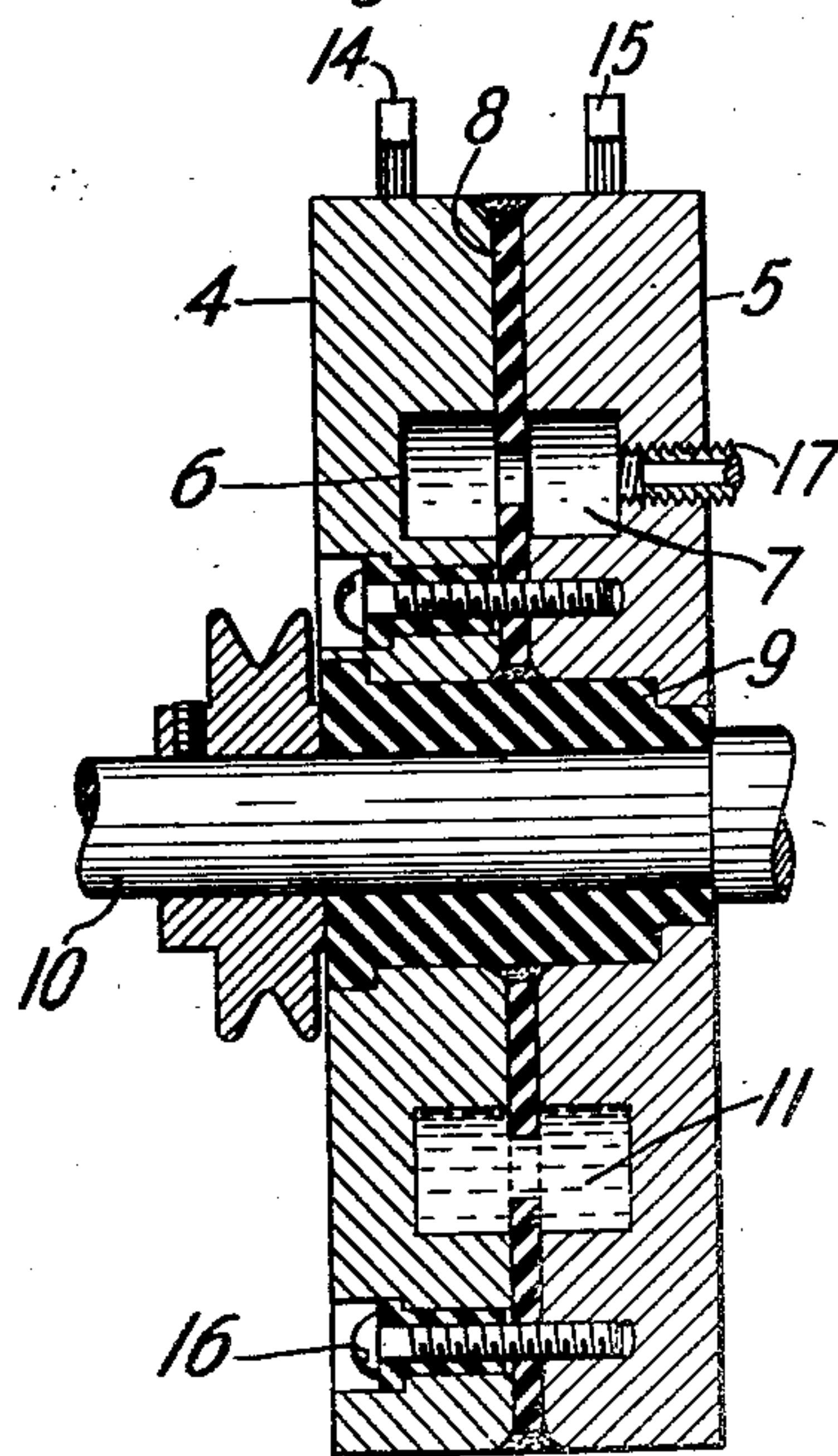


Fig. 2



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UNITED STATES PATENT OFFICE.

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ROTARY MERCURY INTERRUPTER.

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This invention relates to rotary interrupters and more particularly to mercury interrupters.

Interrupters consisting of two insulated chambers containing mercury and arranged to be simultaneously rotated so as to permit the mercury to periodically contact through openings in the insulating partition have been used in the past. The interrupter of this invention is an improvement in this general type and in a preferred embodiment consists of two metal discs each having an annular groove formed on the inner face, so that when the discs are clamped together with an insulating partition separating them, these grooves form a pair of annular chambers in which a definite quantity of mercury is placed. When the discs are mounted on a horizontal shaft and rotated, openings in the insulating partition permit the mercury in the two chambers to come together thus making contact between the two rings, the length of the make and break periods being controlled by the quantity of mercury, the shape and spacing of the openings in the partition, and the speed of rotation.

The use of annular chambers gives in effect columns of mercury whose free surface is small, thus minimizing the tendency for turbulence and giving accurate control of the make and break intervals. The shape of the chambers also permits the switch to operate satisfactorily even when the shaft is inclined at a considerable angle. The form of the interrupter makes it very easy to construct and permits the assembly to be hermetically sealed.

This invention can be more readily understood by reference to the following detailed description in connection with the drawing in which:

Figs. 1 and 2 show respectively, a front elevation partly in section and a sectional side elevation of one embodiment of the invention.

Referring to the drawing, there are shown two metallic discs 4 and 5 provided with annular grooves 6 and 7, respectively. These discs are clamped together with an insulating partition 8 of asbestos board between them, and provided with an insulating hub 9 arranged to be mounted on a horizontal shaft 10. The screws 16 for clamping the assembly are set in insulating bushings so that the

discs are insulated from each other. The grooves 6 and 7 and separating partition 8 form two insulated chambers in which is placed a definite quantity of mercury 11. The partition 8 is provided with two openings 12 and 13 which, when the discs are rotated, permit the mercury in the two chambers to come in contact making a connection between the two discs. Brushes 14 and 15 are in contact with the discs and are provided for connecting the interrupters in a suitable circuit.

The inner rims of the discs are provided with fillets and the diameter of the partition is made slightly smaller than that of the discs to permit the use of sealing compound for hermetically sealing the discs.

A tube 17 is provided through the wall of the disc 5 so that the air may be pumped out and the space above the mercury filled with an inert gas after which operation, the tube is sealed.

The length of the make and break periods is determined by the speed of rotation, the number, shape and size of the openings in the partition and the quantity of mercury, any or all of which may be varied to give the desired interruption characteristic.

The shape of the switches makes them readily adapted to be mounted on a common shaft in multiple units such as are often required in a telephone plant. If desired, for example for obtaining a required interruption characteristic, two or more discs may be mounted together to form independent or cooperating chambers.

What is claimed is:

1. An electric switch comprising two annular chambers, an insulating partition therebetween having an opening therein, a liquid conductor partially filling each of the two chambers, and means for simultaneously rotating said chambers.

2. An electric switch comprising a pair of rotatable discs of conducting material, an annular groove in one face of each of said discs, said grooves having substantially equal diameters, a partition of insulating material having an opening therein, means for clamping said discs together to form two annular chambers having an insulating wall therebetween formed by said partition and communicating with each other by means of said opening, and a liquid conductor partially filling each of the chambers.

3. An electric switch comprising a pair of rotatable rings of conducting material, an annular groove in one face of said rings, said grooves having substantially equal diameters, a hub of insulating material on which said rings are mounted, a partition of insulating material having an opening therein, bushings of insulating material in one of said rings, screws mounted in said bushings for clamping said rings together to form annular chambers having an insulating wall therebetween formed by said partition and connected together at one point by the opening, a liquid conductor partially filling each of the chambers, and means for hermetically sealing the chambers.

4. An electric switch comprising a pair of rotatable rings of conducting material, each having a substantially equal diameter annular groove in one face of relatively small cross-sectional area, said rings being rigidly fastened together with an insulating partition therebetween to form two annular chambers, a liquid conductor partially filling the two chambers, and openings in said par-

tion through which the liquid in said chambers periodically makes contact when the rings are rotated.

5. An electric switch comprising two curved columns of a conducting liquid having a relatively small free surface, an insulating member separating the said columns, an opening in said insulating member, and means for rotating said member to bring said opening between said columns whereby the liquid forming said columns is permitted to come in contact.

6. An electric switch comprising two adjacent and relatively slender curved columns of mercury of the same radius of curvature and cross-section and having a common axis, an insulating partition separating said columns, an opening in said partition, and means for rotating said partition to periodically bring said opening between said columns.

In witness whereof, we hereunto subscribe our names this 19th day of October, A. D., 1926.

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