

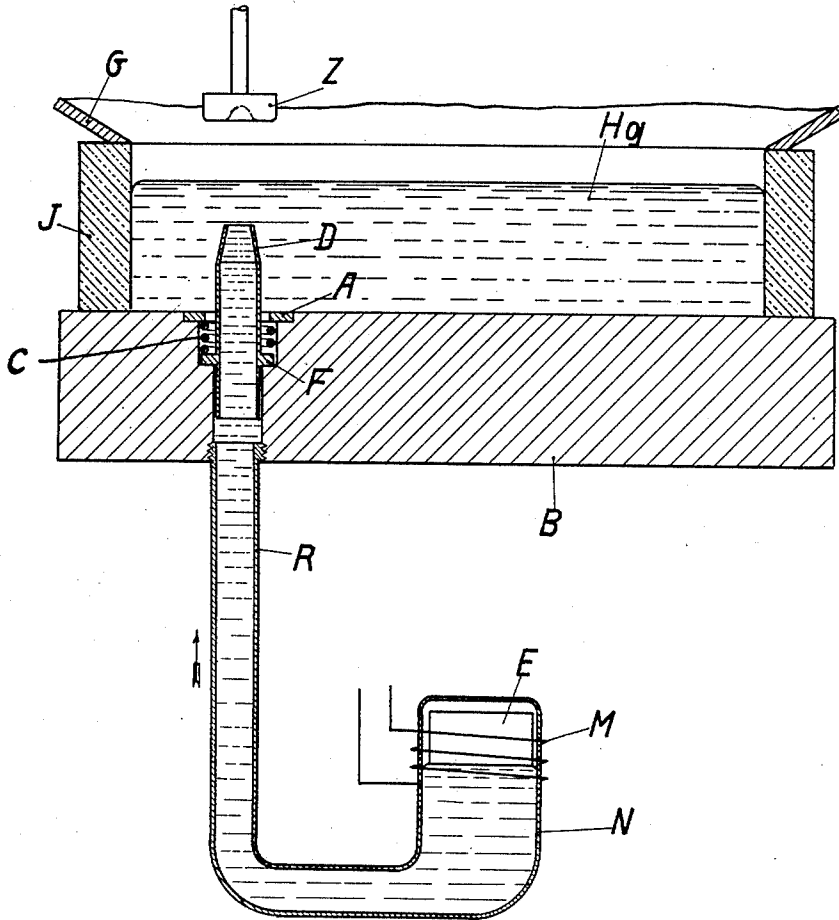
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IGNITION DEVICE FOR MERCURY ARC RECTIFIERS

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IGNITION DEVICE FOR MERCURY-ARC RECTIFIERS

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The invention concerns the ignition device for mercury arc rectifiers in metal or glass containers by which the temporary electrical connection, necessary for the striking of the
5 are between the ignition anode and the mercury cathode, is made and broken by means of a compressing piston. A device of this type already known makes use, for glass rectifiers for example, of a centrally bored piston float-
10 ing on the mercury in the tubular shaped cathode container. The piston is caused to force a jet of mercury against the anode by being drawn into the mercury forming the
15 cathode through the influence of an electro-magnet. This arrangement has the disadvantage that, due to the long distance between the cathode and anode, there exists the possibility that the jet of mercury will not
20 hit the anode but will miss it, due for example to a slight displacement of the piston which is only loosely guided. The arc will therefore not be struck. There exists another known device which consists of an electro-
25 magnetically impelled piston which forces mercury from its cylinder through a pipe and a nozzle fixed rigidly in the cathode container against the ignition anode which is arranged closely over the surface of the mercury. In order to avoid the arc, under normal
30 working conditions, striking the nozzle, it is necessary with this arrangement so to place the nozzle that its rim lies under the surface of the mercury when the rectifier is in service. Thus when the rectifier is out of service the nozzle will be so far under the cathode
35 mercury surface that the jet of mercury developed by the piston will lose some of its energy due to friction with the cathode mercury although breaking through its surface and displacing it. Owing to the disturbance formed on the surface the already weakened jet will be deflected so that it will no longer strike the anode, thus causing faulty
40 ignition which is detrimental to rectifier operation.

According to the invention, the described disadvantages are avoided by so arranging the nozzle formation at the pipe end, that it
50 can move towards the ignition anode under

the influence of the mercury forced through it.

The drawing shows, as a constructive example of the invention, the cathode of a rectifier in a metal container. G is the sloping
55 bottom of the metal container, J the cathode insulator and B the bottom plate of the cathode which has above it the cathode mercury Hg. Z is the ignition anode. The U-shaped pipe R which is filled with mercury from the
60 cathode is fixed to the bottom plate B. The other limb of the pipe is formed into a cylinder N and contains the float E which can be actuated by the ignition coil M. The cylindrical boring in the cathode bottom plate B,
65 to which the pipe R leads, serves as a guide to the nozzle D. The nozzle is provided for the purpose with a guide ring F which slides loosely between end-stops in a second boring. The boring is connected to the cathode mer-
70 cury and to the pipe R through openings in the upper end-stop A and in certain cases through clearances in the guide ring F of the nozzle. The moving nozzle D is arranged in
75 the cathode container so that its opening is under the surface of the cathode mercury both before it is lifted by the mercury forced through it and after its stroke is completed. The nozzle is most suitably made of a metal,
80 the specific gravity of which is greater than mercury, for example tungsten, tantalum, molybdenum, etc., which have also the property of high melting points. The use of such metals for the nozzle assures that it
85 will sink automatically, due to its weight, to its original position after it has been moved up upward by the mercury forced through it. The return of the nozzle may be assisted by a compression spring C placed
90 between A and F. In this case it is not necessary to make the nozzle of a metal of a higher specific gravity than that of mercury. When igniting the rectifier a current impulse is sent through the coil M whereby the piston
95 E is drawn into the cylinder N. The mercury is forced from the cylinder through the tube R and out of the nozzle D. Due to the friction of the mercury against the inner wall of the nozzle and by the mercury's upward movement, the nozzle will be lifted towards
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the anode, that is to say, the intervening layer of mercury, through which the jet has to break, is therefore reduced. The mercury jet is consequently conducted in the tube until it breaks through the surface and thus faulty ignition is avoided. The mercury thrown against the ignition anode forms a momentary electrical connection between it and the mercury of the cathode. The piston will be lifted into its original position by the mercury flowing back as soon as the ignition current to the coil M is interrupted. The pipe R and the nozzle guiding cylinder will be refilled through the nozzle D. The device is thus ready for further ignition.

What I claim is:

1. An ignition device for mercury arc rectifiers by means of which mercury is forced from a compression cylinder through an arrangement of piping against a rigidly fixed ignition anode placed above the surface of the cathode mercury, characterized by the formation of the nozzle forming the end of the system of piping which is such that the nozzle is free to move in the direction of the ignition anode under the influence of the mercury forced through it.

2. An ignition device as claimed in claim 1, characterized by the feature that the movable nozzle is so arranged in the cathode container that its opening is under the surface of the cathode mercury before it is moved by the mercury forced through it.

3. An ignition device as claimed in claim 1, characterized by the feature that the movable nozzle is so arranged in the cathode container that after the full movement of the nozzle due to the mercury forced through it, its opening still remains under the surface of the cathode mercury.

4. An ignition device as claimed in claim 1, characterized by the feature that the movable nozzle is made of a metal, the specific gravity of which is greater than that of mercury.

5. An ignition device as claimed in claim 1, characterized by the feature that the movable nozzle is made of a metal having a high melting point (tungsten, tantalum, molybdenum).

6. An ignition device as claimed in claim 1, characterized by the feature that the movable nozzle is returned to its original position by means of a spring.

7. An ignition device as claimed in claim 1, characterized by the feature that the movable nozzle is loosely guided in a hollow cylinder which is provided with end-stops for the nozzle movement and gives communication to the cathode container.

In testimony whereof I have signed my name to this specification.

JULIUS JONAS.