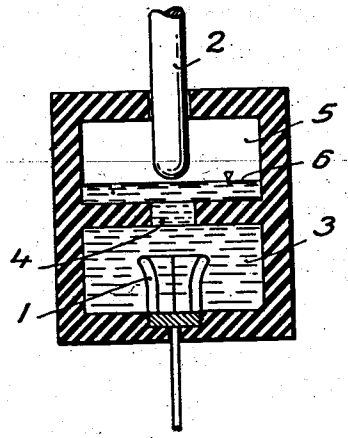
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Examiner

July 17, 1934. O. MAYR 1,967,095

LIQUID FOR ELECTRICAL PURPOSES AND APPARATUS CONTAINING SAME

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Mannitol + H2O



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LIQUID FOR ELECTRICAL PURPOSES AND APPARATUS CONTAINING SAME

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Application December 7, 1932, Serial No. 646,199
In Germany December 11, 1931

3 Claims. (Cl. 200—150)

My invention relates to liquids for electrical purposes, more specially to liquids for use in electrical apparatus wherein an electric power current is to be diminished and interrupted, such as electric circuit breakers and resistors.

Circuit breakers are known in which a liquid extinguishing the arc is used. In circuit breakers of this kind, non-combustible liquids such as water, have already been used instead of oil as arc extinguishing agents for the purpose of switching high power circuits, especially in the case of alternating current. In the case of such liquids being conductive—and this case will especially come into question—it is possible at the same time to greatly influence the switching process by regulating the specific resistance of the liquid. In practice, circuit breakers of this kind adopt generally the type of the well-known extinguishing chamber since this latter type allows of the switching process being most easily controlled. In the case of very high power currents being switched by means of such current breakers the arc has in general a duration of only about one half period whereas with currents of some hundred amperes the duration of the arc extends over several half periods owing to the pressure in the extinguishing chamber being raised only gradually by small currents.

A principal object of my invention is the provision of an improved arc extinguishing liquid for electric circuit breakers.

My invention will be more fully set forth in the following description referring to the accompanying drawing, and the features of novelty which characterize my invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

The single figure of the drawing is a fragmentary elevational view, partly in section, of a single pole electric circuit breaker of a type in which my improved arc extinguishing liquid may be used.

I have found that a solution of mannitol in water is an improved liquid for use for the purposes described. The improved liquid will give especially useful results when used for switching small currents. The specific resistance of this solution can be suitably regulated in such a manner that it becomes possible to switch off circuits of up 1000 amperes without any formation of sparks or arcing, the switch acting mainly as a mere resistance switch. At the same time the freezing point of the water is lowered so that circuit breakers of this kind may be used at temperatures below 0° C.

In order to make the specific resistance of the solution as independent of the temperature as possible it is advisable to add boric acid to the solution of mannitol in water.

The improved switch liquid possesses a certain electric conductivity so that the circuit is not entirely interrupted when the contact pieces of the switch are removed from each other. It is, therefore, necessary either to pull the movable contact out of the liquid towards the end of the switching operation, or to arrange in the circuit a further switch disposed in air or in a liquid, said switch being opened simultaneously with, or after, the main switch.

The improved liquid can advantageously be used also in electrical resistors of the type of liquid resistors wherein the circuit is not to be switched off but the resistor is to be switched on or regulated.

The accompanying drawing shows a circuit breaker comprising an extinguishing chamber and being suitable for the performance of my invention. In the drawing, 1 is a fixed cap contact adapted to cooperate with a movable pin contact 2. The contacts are disposed in the extinguishing or pressure chamber 3, the fixed contact 1 being suitably fastened therein. The chamber 3 is entirely closed but has the opening 4 adapted to receive the movable contact 2. An antechamber 5 is situated above the opening 4 for condensing the vapors developed during the switching process. The chambers 3 and 5 are formed by insulating walls as illustrated. Both the chamber 3 and part of the antechamber 5 are filled with a solution of mannitol in water added boric acid said liquid having its level at 6. Interruption of the circuit is accomplished by disengaging the contacts 1 and 2 by vertical movement of the contact 2 to a position above the liquid level. My improved arc extinguishing liquid 3 is effective to interrupt currents of the order of magnitude above referred to.

I claim:

1. In an electric circuit interrupter including relatively movable contacts, an arc extinguishing liquid in which said contacts are arranged to separate comprising a solution of mannitol and water.

2. In an electric circuit interrupter including relatively movable contacts, a current interrupting liquid in which said contacts are arranged to separate comprising a high resistance solution of mannitol and water.

3. In an electric circuit interrupter including relatively movable contacts, an arc extinguishing liquid in which said contacts are arranged to separate comprising a solution of mannitol, boric acid and water.

OTTO MAYR.

252. COMPOSITIONS. Cross Reference Examiner

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CERTIFICATE OF CORRECTION.

Patent No. 1,967,095. July 17, 1934.

OTTO MAYR.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, line 49, after "up" insert the word to; and line 93, after "added" insert with; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 11th day of September, A. D. 1934.

Leslie Frazer

(Seal)

Acting Commissioner of Patents.