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OVERVOLTAGE SUPPRESSOR

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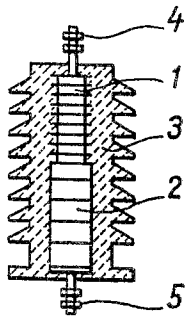


Fig. 1

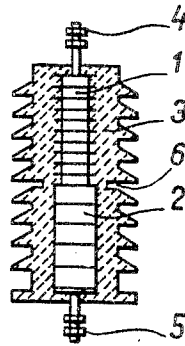


Fig. 2

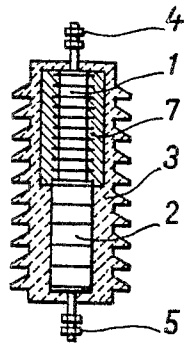


Fig. 3

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3 Claims. (Cl. 315—52)

The invention concerns an overvoltage suppressor or lightning arrester with a quenched-spark or quench spark gap and voltage-responsive or non-linear resistors connected in series.

In the old overvoltage suppressors of this kind the quenched-spark gap and resistors are as a rule surrounded by a weatherproof and airtight housing of porcelain, glass or ceramic material. In such overvoltage suppressors it happens that on account of overload through excessively great lightning currents or excessive service voltage the gas enclosed in the housing is heated too much and blows up the housing explosively. The gas in the cavities in the interior of the housing accumulates the energy of the arc and expands when the housing is blasted, large fragments of the housing being hurled about with great momentum. To prevent this it has been tried to interrupt the excessive current by means of fuses connected in series, or to carry off the excessive pressure to the outside by means of explosion openings. However these arrangements have not been able to prevent the explosive blasting of the housing, as they are too sluggish in the face of the steep increase in pressure caused by the strong arc. For that reason it has already been proposed to build into the overvoltage suppressor an intermediate jacket made of laminated paper. This requires however a complicated construction and, moreover, laminated or hard paper is sensitive to moisture.

The purpose of the present invention is to eliminate the inconvenience described. According to the present invention the quenched-spark gap and the voltage-responsive resistors are surrounded by castable and hardenable, i. e., thermosetting, synthetic resin, which at the same time forms also the housing of the overvoltage suppressor. In this manner the cavities in the interior of the overvoltage suppressor can be reduced to a minimum, that is to say to the required quenching spaces of the spark gap. The arc produced by the overload can thus heat only the slight amount of gas present in the quenching spaces, with the result that the gas pressure created acts on a comparatively small surface and thus does not blow up the housing. This is all the more so, as castable resin, with which suitable fillers may be mixed, forms together with the embedded parts after hardening a mechanically solid compact, i. e. monolithic unit. Moreover synthetic resin is not so brittle as for example porcelain or glass, so that even in the case of a fracture through overload of the overvoltage suppressor of the present invention an explosive hurling about of parts of the housing does not take place.

The present invention makes it possible to construct an overvoltage suppressor in one piece, as an outer hous-

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ing is no longer necessary. If a weatherproof castable resin is employed, the present overvoltage suppressor is also suitable for installation in the open air.

As an additional safety device, the synthetic-resin housing of the overvoltage suppressor of the present invention may be provided with a mechanically weak spot at which on the occurrence of an excessive overpressure the housing may be decomposed into two parts, whereby the arc produced is interrupted.

If necessary the quenched-spark gap may be embedded by itself in a first synthetic-resin body, tested electrically and closed hermetically, and then the first synthetic-resin body enclosing the quenched-spark gap may be embedded together with the resistors in a second synthetic resin body. The two synthetic filler or their fillers may be of a different kind.

The drawing shows three examples of embodiment of the subject matter of the invention in longitudinal section.

In Figs. 1, 2 and 3, 1 is a quenched-spark gap consisting of a number of spark-gap sections, 2 represents the voltage-responsive resistors, 3 is the synthetic-resin body made of hardenable casting resin, in which the quenched-spark gap 1 and the resistors are embedded, and which forms at the same time a weatherproof housing of the overvoltage suppressor, and 4, 5 are the electric connections.

In Fig 2 another overvoltage suppressor of the invention exhibits a mechanically weak point 6 at which, on the occurrence of an excessive interior overpressure the housing may be decomposed into two parts.

Fig. 3 shows an overvoltage suppressor the quenched-spark gap 1 of which is first embedded in a first synthetic-resin body and then together with the voltage-responsive resistors 2 in the principal synthetic-resin body 3.

Having thus described my invention I claim:

1. A monolithic hermetically-sealed lightning arrester comprising a stack composed of a number of spark-gap sections, and a plurality of voltage responsive resistors, electric connections at opposite ends thereof, and a body of synthetic resin in which said electric connections, spark-gap sections and resistors are embedded, and which forms at the same time a weatherproof housing therefor through which the electric connections project, said lightning arrester having a minimum of undesirable cavities in the interior thereof, so that the arc produced by an overload can heat only the slight amount of gas produced by the quenching spaces, with the result that the gas pressure created acts on a comparatively small surface and thus minimizes pressure tending to blow up the housing.

2. A lightning arrester as in claim 1, in which the synthetic-resin housing has at least one mechanically weak point at which the housing may be split into two parts on the occurrence of an excessive interior pressure.

3. A lightning arrester as in claim 1, in which said body of synthetic resin includes an internal separately cast synthetic resin enclosure for the spark-gap sections alone.

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