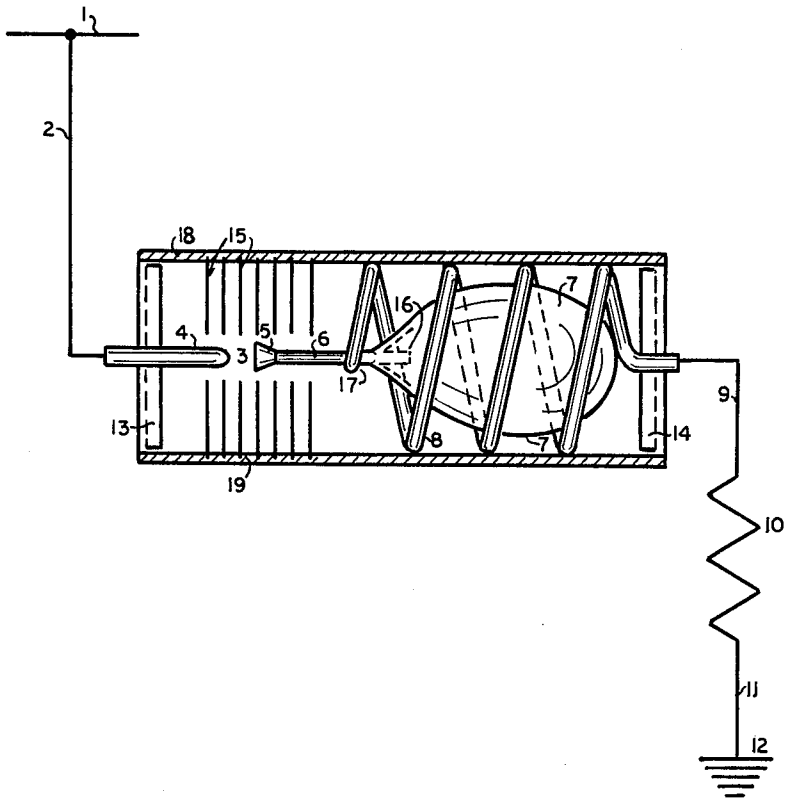
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LIGHTNING ARRESTER

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LIGHTNING ARRESTER

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The purpose of this is to provide a simple lightning arrester of great current interrupting capacity, beyond that offered by the ones available at present. This objective is achieved by inserting a spring into the conductor leading to the gap. At passage of current through the latter, the spring is compressed and squeezes an elastic, insulated container blowing air into the gap, thereby facilitating the interruption of the arc.

In the accompanying drawing, showing a schematic longitudinal section of this lightning arrester, numeral **1** designates the protected line, which is connected by means of lead **2** to point **4**, between which and electrode **5** is formed a gap **3**. Electrode **5** has the shape of a funnel attached to the end of tube **6**, which is connected to container **7** made of heat resistant plastics, or corrugated, asbestos insulated sheet steel. Part **16** of tube **6** sticks into the container **7**, which is surrounded by spring **8**, made of steel, or beryllium-copper. Spring **8** is connected to tube **6** by means of weld **17**, and is also conductively linked, by means of conductor **9**, through current limiting resistor **10** and conductor **11** to ground electrode **12**. Electrodes **4** and **5**, as well as spring **8** and container **7** are mounted in enclosure **18**, made of insulating material, preferably of fiber, which releases gas when striken by an electrical arc. Metallic meshes **13** and **14**, prevent the entrance of insects into enclosure **18**. Numeral **15** designates annular electrodes serving in capacity of a de-ion grid. They are placed in grooves **19**, cut into the wall of container **18**.

In operation of this lightning arrester, when conductor **1** is subjected to a voltage surge, gap **3** is overbridged by the arc, and the corresponding current flowing through the winding of spring **8** causes it to be retracted by the action of parallel currents attracting each other in consecutive windings. The retracted spring **8**, presses container **7**, from which air is blown through tube **6** into gap **3**. The arc is interrupted at the passage of the current through zero, because of the elongation of the arc caused by retraction of the spring, and also because of the mechanical interruption of the arc by the air coming out from tube **6**, by the cooling of the arc space by this air, and by its replacing the ionized gas in the arc space. If container **18** is made of fiber, the latter if in contact with the arc, releases gas which also contributes to the extinction of the arc. The latter effect is not essential to the functioning of this lighting arrester. Similarly, the funnel-shaped end **5** of tube **6** can be lined with

fiber, which can also release gas facilitating the interruption of the arc. If such lining is not used, electrode **5** may be simply tubular.

This lightning arrester can be used for A.C. and D.C. power and communication lines, for over-voltage protection of electric power stations and sub-stations, high and low voltage overhead lines, as well as for protection of transformers and rotating electric machinery. Since after passage of the current the spring returns to its original shape, and the container is filled with air, the lightning arrester is ready for repeat operation. The gap can be arranged in vertical position, as well as the spring, which can be mounted in a housing of porcelain, glass, plastics. Such lightning arresters with three gaps, for three phases can be put in one housing which can be mounted on one bracket connected to one current limiting resistor linked to ground. A spring of strap, or of coiled steel wire can be used. Many other modifications and variations of this lightning arrester can be made in the spirit and within the scope of the following claims.

I claim:

1. A lightning arrester of at least two counterposed electrodes, one of which being connected to the protected line, the other to a coil embracing an elastic insulated container having an outlet in the direction of said gap, into which air is blown from said elastic container when the latter is squeezed by the coil, which is retracted when it is passed by the lightning current.

2. A lightning arrester consisting of two counterposed electrodes, one of which being connected to a spring which is contracted at the passage of current through it.

3. A lightning arrester as in claim 2, except that said spring embraces an elastic, insulated container connected to a tube which serves as one of the electrodes and is provided with a cone lined with fiber and boric acid, said lining releasing gas under the influence of an arc between the electrodes, said spring being connected to ground through the intermediary of a current limiting resistor.

4. A lightning arrester as in claim 2, except that said spring is made of steel and is of conical shape on both ends.

5. A lightning arrester as in claim 2, except that said spring is made of beryllium-copper.

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