May 28, 1929. E. A. EVERETT 1,714,552

SPARK GAP LIGHTNING ARRESTER

Filed Aug. 30, 1926

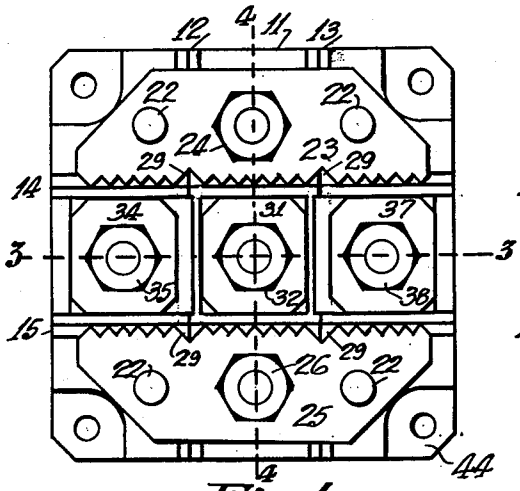


Fig. 1

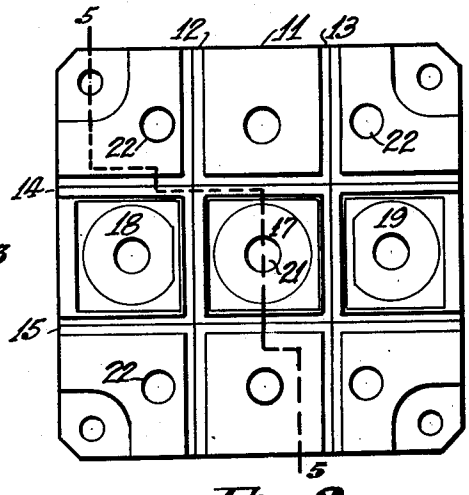


Fig. 2

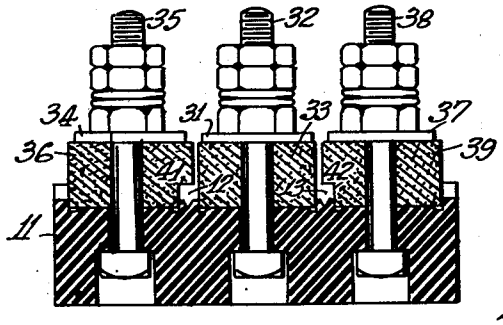


Fig. 3

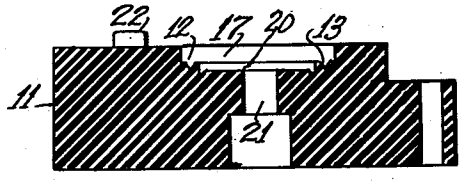


Fig. 5

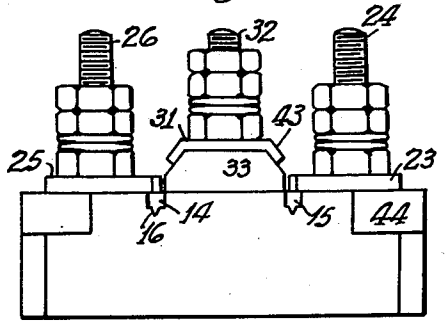


Fig. 4

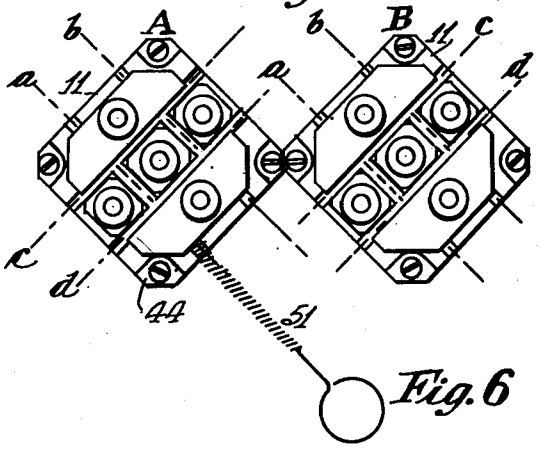


Fig. 6

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UNITED STATES PATENT OFFICE.

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SPARK-GAP LIGHTNING ARRESTER.

Application filed August 30, 1926. Serial No. 132,627.

This invention relates to lighting arresters of the spark-gap type and has for an object to improve arresters of this type whereby greater reliability is obtained and facilities are provided for adjusting the parts and preventing the accumulation of dust between the elements of the device. Other objects will appear from the following specification and the accompanying drawings, in which, Fig. 1, is a top view of an arrester complete embodying my invention, Fig. 2 is a top view of the insulated base upon which the elements of the arrester are assembled, Fig. 3 is a vertical cross-section on line 3—3 of Fig. 1, Fig. 4 is an elevation at right angles to Fig. 3, Fig. 5 is a vertical cross-section on line 5—5 of Fig. 2 and Fig. 6 shows a preferred arrangement for locating these arresters in a cable box.

The present invention comprises a base of insulating material, preferably moulded Bakelite on the top surface of which are a pair of transverse grooves and a pair of vertical grooves at right angles to the transverse grooves. These grooves are rectangular in form with a V groove projecting from the bottom and divide the top surface on the base into nine squares. The outer row of squares are provided with dowel pins to receive a toothed plate which is held in place by the dowels and by a central binding post. The central row of squares are depressed below the base of the groove to receive blocks of carborundum which are located with precision in these depressions and held in place by binding posts and a clamping plate on top of each block.

The teeth of the toothed plates point towards the carborundum blocks and are maintained in fixed relation thereto so that the spark gap is not varied and cannot vary when the device is taken apart and reassembled.

In arresters of the spark-gap type it is important to guard against dust bridging the gap. With this end in view the rectangular grooves are arranged immediately below the spark gaps and are much wider than the spark gaps so that a substantial air gap is formed in the surface of the base below the gaps. These grooves run straight through the base from one side to the other so that the dust can easily be removed by a cleaning rod.

In the drawings, 11 is the base, 12 and 13 are the vertical grooves and 14 and 15 are the transverse grooves which intersect each other and pass straight through the base. The central row of squares 17, 18 and 19 are depressed as indicated in Fig. 5 to the depth 20 which is below the base of the grooves. Apertures are provided as at 21 for the binding posts which secure the carborundum blocks hereafter referred to in these depressions.

The discharge plate 23 is secured to one side of the base by the dowel pins 22 and by the binding post 24. On the opposite side of the base, a corresponding discharge plate 25 is secured by the dowels 22 and by the binding post 25. The teeth of these plates point towards the centre and it will be noted where they align with the grooves 12 and 13, a tooth is missing and the depression in the plate is enlarged as at 29.

The central binding post 32, which is usually grounded, clamps the carborundum block 33 below the plate 31 in the depression in the base to which it is accurately fitted. It will be noted from Fig. 4 that the upper edges of the block 33 slope inward and are engaged by the complementary sloping edges of the plate 31 as at 43. These sloping edges are preferably made a snug fit.

The carborundum block 36 is secured in its depression by the binding post 35 through the plate 34. The face of this block at 41 is under-cut as shown to provide for the continuation of the rectangular groove 12. That is, the head portion projects over the base for about half its height forming with the adjoining block a pair of vertically parallel discharge surfaces. The block 39 is similarly secured in its recess by the binding post 38 and the clamping plate 37. The face of this block is under-cut at 42 to provide for the continuation of the groove 13 and form with 33 a pair of vertically parallel discharge surfaces.

It will be noted from Fig. 3 that the grooves 12 and 13 are located directly below the air gap between the carborundum blocks, also from Fig. 4 it will be observed that the grooves 14 and 15 pass immediately below the saw teeth of the plates. The surface of these grooves is purposely enlarged by a V depression as at 16, Fig. 4 which increases the surface over which leakage between the elements would have to take place and enlarges the space for the reception of particles of dust that may accumulate between the parts.

These arresters are preferably placed in rows with the corners adjacent as shown in Fig. 6 and secured in place by corner screws as at 44. In this position, it will be noted

that the cleaner 51 can be pushed directly through the grooves *a*, *b*, *c* and *d* in each of the arresters A or B as these grooves are exposed in both directions and thus the dust is readily cleaned out from below the spark gaps. When the arresters are placed vertically as in Fig. 6 it will be noted that the tendency is for the dust to pass through the groove by gravity instead of accumulating under the spark gaps.

The purpose of omitting the tooth in the plates 23 and 25 over each of the grooves 12 and 13 is to avoid obstruction to the cleaning tool which would be liable to catch on a projecting tooth at this point.

This arrester is manufactured so that it may be repaired and assembled in the field. The teeth in the plates are milled to insure accuracy with relation to the dowel pins and the sides of the carborundum blocks are ground to accurately fit the recesses moulded in the base. The parts cannot warp out of position and the air gap is insured with accuracy and reliability.

Having thus described my invention, I claim:

1. In a lightning arrester as described, the combination, a base of insulating material having a plurality of rectangular grooves passing at right angles across its surface, a row of carborundum blocks located between said grooves and spaced from each other by an air gap in line with said grooves and a toothed plate at the side of said row with the teeth aligning with one of said grooves but with the teeth omitted at the intersection of said grooves.

2. A lighting arrester comprising an extended plane base of insulating material having a central row of spaced rectangular depressions substantially one third of its surface, a pair of discharge plates on the plane top of said base extending one on each side of said depressions, dowels holding said plates in position, a rectangular carborundum block in each of said depressions having a base making a snug fit in said depressions, some of said blocks having a head with a vertical face for substantially half its height projecting over its base and forming with the adjacent block a pair of vertically parallel discharge surfaces and a rectangular passage below said discharge surface, binding posts for securing said blocks to said base and grooves extending across said base below said discharge plates in line with the space between said blocks.

3. A lightning arrester comprising a base formed of a block of insulation having a plane surface and a central depression with three formed recesses thereon, discharge plates secured to said base, one on each side of said depression and covering substantially the plane surface of the base and having discharge teeth aligning with and projecting over said depression, a rectangular carborundum block snugly fitting the central recess, other carborundum blocks snugly fitting the outer recesses and each having a face opposing in a discharge gap, a face of said central block, a portion of said blocks cut away to form with the central block rectangular grooves below the spark discharging faces, grooves on the plane surface of said base at right angles to said teeth and below said discharge plates aligning with each of said first mentioned grooves and discharge plates on top of each of said blocks in sparking relation with said first mentioned discharge plates.

In testimony whereof I affix my signature.

EDWARD A. EVERETT.