

H. O. STOELTING
LIGHTNING ARRESTER

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Fig. 1

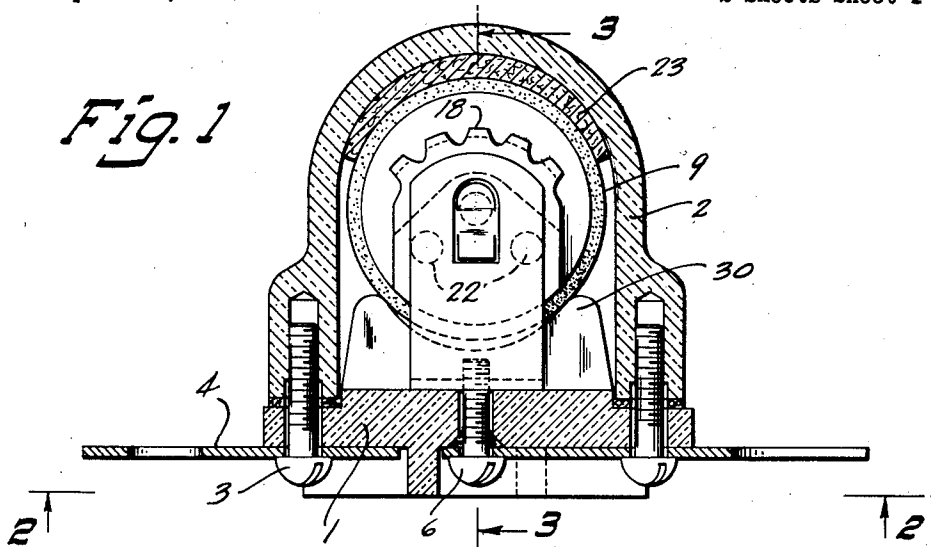


Fig. 2

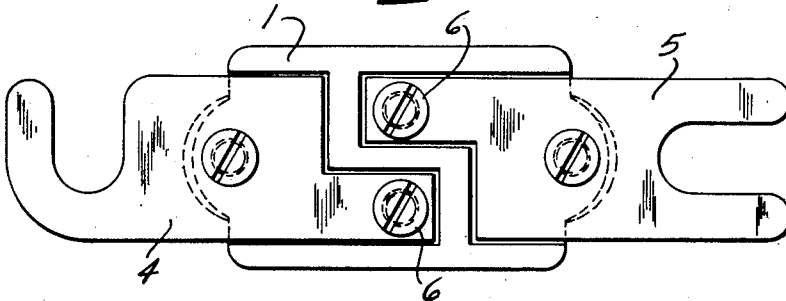


Fig. 3

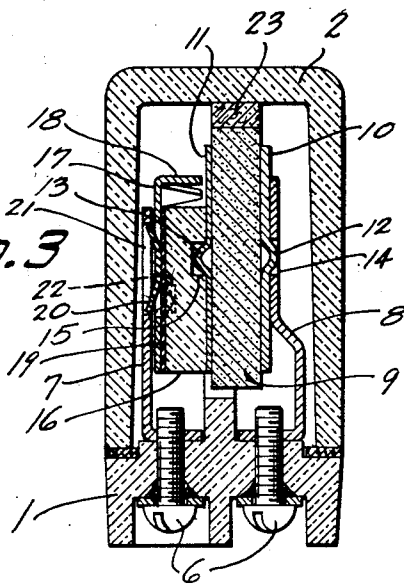
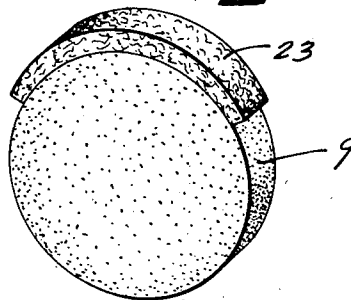


Fig. 4



INVENTOR.
Herman O. Stoelting
BY
Arthur R. Woodfolk
Attorney

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H. O. STOELTING
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Fig. 5

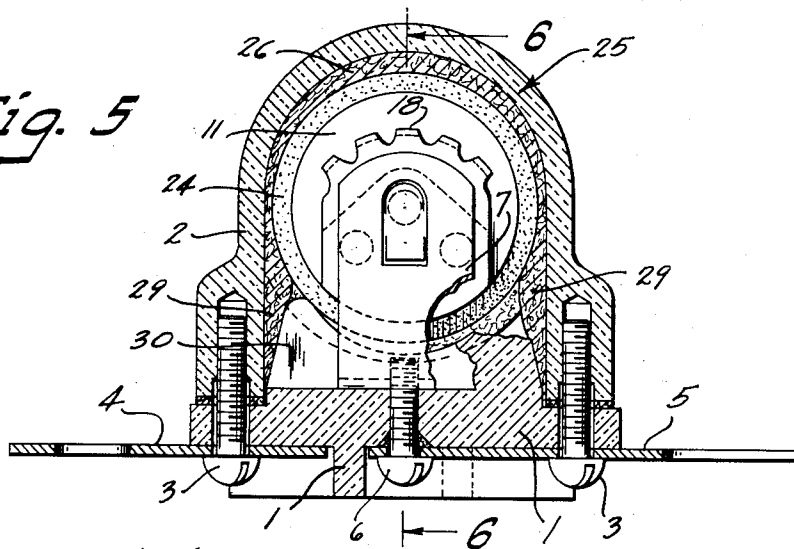


Fig. 6

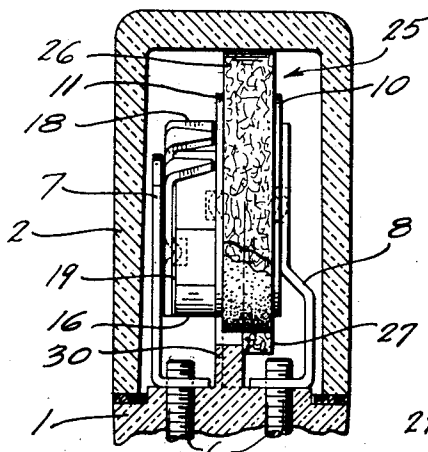


Fig. 7

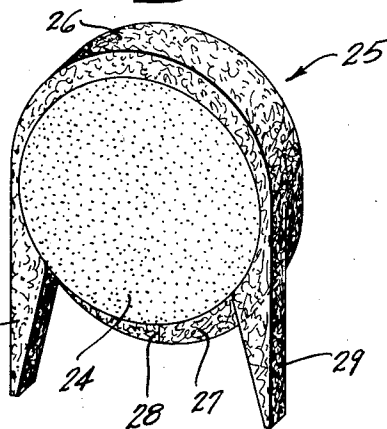
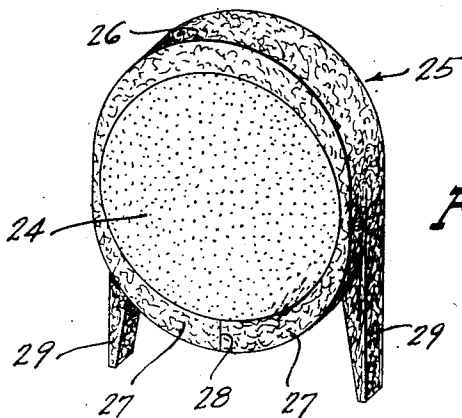


Fig. 8

INVENTOR.
Herman O. Stoelting
BY
Austin R. Woolfolk
Attorney

UNITED STATES PATENT OFFICE

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LIGHTNING ARRESTER

Herman O. Stoelting, Milwaukee, Wis., assignor
to McGraw Electric Co., Milwaukee, Wis., a corporation of Delaware

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1 Claim. (Cl. 317—67)

1

2

This invention relates to lightning arresters.

In lightning arresters, particularly those of the disk type where valve material in the form of a flat plate is employed, considerable difficulty has been experienced due to the fact that flash-overs around the valve material frequently occur. The effect of these flash-overs is, therefore, to short out the valve material and to provide a conducting path which bridges or shunts the valve material. In lightning arresters of this general type the valve material is in a compacted form and is relatively thin, usually in the form of a disk. There is, therefore, not very much physical space between the two conducting plates on opposite sides of the valve material and though this space is greater than the spark gap in series with the valve material, nevertheless under severe conditions, flash-overs around the valve material occur, thereby rendering the valve material ineffective.

This invention is designed to overcome the above noted defects and objects of this invention are to provide lightning arresters which are so made that they prevent flash-overs around the valve material and thus insure the valve material acting in its desired capacity.

Further objects are to provide a construction which is very simple and which can be readily applied to existing types of lightning arresters without any alteration of the structure of the arrester itself.

Embodiments of the invention are shown in the accompanying drawings, in which—

Figure 1 is a sectional view through a disk type valve arrester with means provided for substantially preventing flash-overs.

Figure 2 is a bottom view of the lightning arrester, such view corresponding to the line 2—2 of Figure 1.

Figure 3 is a sectional view on the line 3—3 of Figure 1.

Figure 4 is a perspective view of the valve material with the felt barrier secured thereto.

Figure 5 is a view corresponding to Figure 1 showing a further form of the invention.

Figure 6 is a fragmentary sectional view on the line 6—6 of Figure 5.

Figure 7 is a perspective view of the valve material with the felt barrier thereon, such view being taken from the left-hand side of Figure 6.

Figure 8 is a view corresponding to Figure 6 taken from the opposite side thereof, that is to say, from the right-hand side of Figure 6.

Referring to Figures 1 to 4, it will be seen that the lightning arrester comprises an insulating

base 1 and an insulating housing 2, which are detachably secured together by means of screws 3. These screws additionally serve to assist in anchoring or securing the terminal plates 4 and 5. Further than this, screws 6, 6 extend through extensions of the terminal plates 4 and 5 and secure the spring metal clips 7 and 8, see Figure 3, in place. These spring metal clips are adapted to have the lightning arrester properly mounted therebetween and held by the resiliency of the clips.

The lightning arrester assembly comprises a disk 9 of valve material, such for instance as silicon carbide, which is provided on opposite sides with metal plates 10 and 11. The metal plates 10 and 11 have outwardly projecting portions 12 and 13. The outwardly projecting portion 12 is detachably received within an aperture 14 formed in the clip 8, see Figure 3. The outwardly projecting portion 13 is seated within a recess 15 formed in a porcelain insulating block or spacer 16.

The spring clip 7 bears against a metal plate 17 which is provided with a plurality of inwardly turned prongs or fingers 18 adjacent its upper portion, as shown in Figures 1 and 3. The prongs or fingers 18 are spaced a predetermined distance from the metal plate 11. In view of the fact that the tolerance allowed the porcelain spacer 16 is relatively large in comparison to the accurate spacing required between the prongs 18 and the plate 11, an insulating plastic washer or spacer 19 is provided, directly between the plate 17 and the porcelain 16.

Any suitable means may be provided for temporarily fixing the position of the porcelain spacer 16 and the plate 17. For instance, the plate 17 may be provided with outwardly turned ears 20 which fit within a suitable aperture 21 formed in the clip 7. Also the plate 17 may be provided with inwardly pressed portions which fit within corresponding apertures or depressions formed in the porcelain plate 16 and indicated by the reference character 22.

In lightning arresters of this type it has been found that most of the flash-overs occur around the top portion of the valve material 9. Nearly all of these flash-overs can be prevented by providing a felt or similar barrier 23 which may be attached to the valve material 9 or may be simply positioned against the valve material. At all events, this felt barrier 23 is held in place by the cover or housing 2, as is obvious from an inspection of Figures 1 and 3. The material forming the barrier actually used is a form of felt,

although it is to be understood that any other suitable yielding material of an insulating nature may be employed, so that it will seal between the valve material disk 9 and the housing 2.

The construction, thus far described, prevents nearly all of the flash-overs. However, to insure complete protection against flash-overs, the construction illustrated in Figures 5 through 8 is employed. In this form of the invention, substantially the same general arrangement of the parts is employed. However, the disk of valve material is indicated by the reference character 24 and is completely surrounded by a felt member indicated generally by the reference character 25. This felt member has a relatively wide upper portion 26 which has a narrow lower portion 27 which may be split, if desired, as indicated at 28. The felt member or barrier 25 is provided with a pair of downwardly projecting, tapered legs 29 which fit between the upwardly extending support 30 for the disk 24 of the valve material and the adjacent wall of the housing 2, see Figure 5.

In the form of the invention shown in Figure 1, the support 30 merely acts as a support for the disk 9 of valve material. However, in the form of the invention shown in Figures 5 through 8 the support 30 not only acts as a support for the valve material, but also acts as a part of the total barrier for preventing flash-over around any portion of the disk 24.

It is to be noted that the reduced or narrowed portion 27 of the felt barrier 25 bears against the right-hand side, as viewed in Figure 6, of the support 30, the integral support 30 being formed with the base portion 1.

In the last described form of the invention, the felt forms a complete barrier extending all the way around the disk 24 and thus effectively prevents flash-overs around any marginal portion of the disk.

It will be seen that this invention provides an effective means for preventing flash-over around the marginal portion of the disk of valve material and confines the conducting vapors formed by an arc striking at the spark gap from passing around the marginal portion of the disk of valve material and thereby prevents the formation of a conducting path around the disk.

It is to be noted that the plastic washer, combined with the ceramic spacer, enables the accurate spacing of the spark gap electrodes to be obtained. The ceramic spacer varies in thickness due to errors occurring in its manufacture, but the thin plastic washer enables the exact tolerance desired to be obtained.

It will be seen further that the invention may be very readily applied to existing types of lightning arresters without any change in the structure of the arrester itself, other than adding the felt barrier hereinabove described.

Although this invention has been described in considerable detail, it is to be understood that such description is intended as illustrative rather than limiting, as the invention may be variously embodied and is to be interpreted as claimed.

I claim:

A lightning arrester comprising a housing, a pair of terminals carried by said housing, a pair of spring clips mounted within said housing and connected to said terminals, and a lightning arrester assembly mounted between said spring clips and consisting of a disk of valve material having a conducting plate on one side thereof, a second conducting plate spaced from said first conducting plate and forming therewith a spark gap, an insulating spacer of ceramic material interposed between said plates, and a tolerance adjusting plastic washer interposed between said ceramic material and one of said plates, said insulating spacer being relatively thick and said plastic washer being relatively thin.

HERMAN O. STOELTING.

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