

S. S. SONNEBORN.
CONDENSER TYPE SUSPENSION INSULATOR.
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1,247,343.

Patented Nov. 20, 1917.

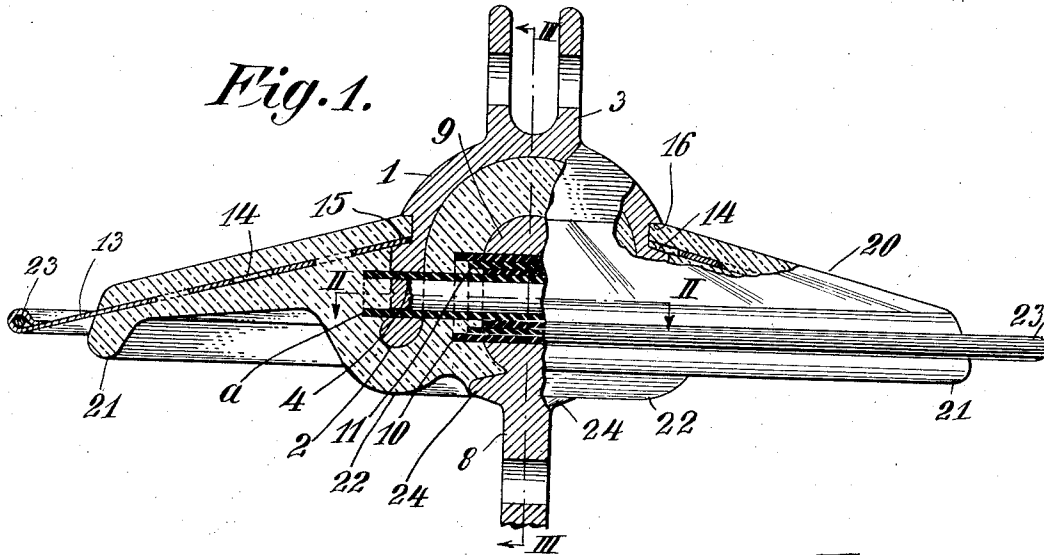


Fig. 2.

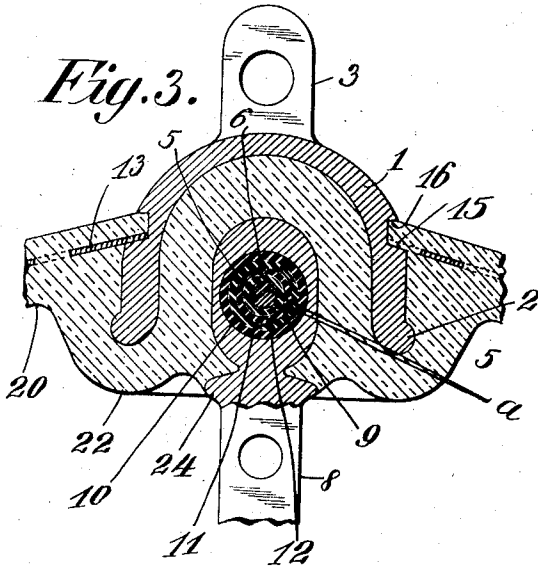
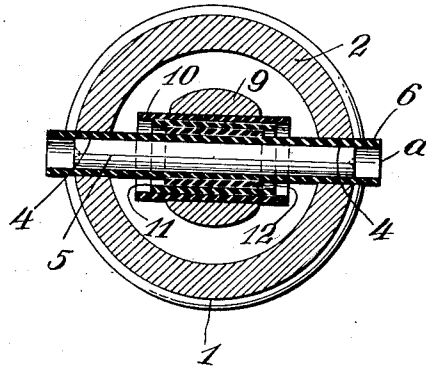
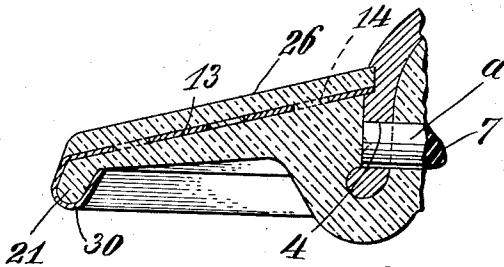


Fig. 4.

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CONDENSER-TYPE SUSPENSION-INSULATOR.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, SOL S. SONNEBORN, a citizen of the United States, and a resident of Brooklyn, county of Kings and State of New York, have invented certain new and useful Improvements in Condenser-Type Suspension-Insulators, set forth in the following specification.

This invention relates to suspension insulators. The object of the invention is to combine in one structure means for distributing electro-static stress in an effective and efficient manner; providing high puncture strength; providing adequate leakage surface; providing dielectric contour lines in substantial conformity to the flow lines of dielectric stress; providing extreme mechanical strength; and many special combinations of these desirable features.

The general broad object of the invention is to provide a highly efficient and economical insulator for high-potential use.

The invention will best be understood in connection with the following claims when studied in connection with the illustrative embodiments described in the following specification, which refers to the illustrative embodiments shown in the drawings which form part hereof. In the drawings Figure 1 is a front elevation partly in section and with parts broken away, showing one embodiment of the invention; Fig. 2 is a bottom plan view taken along line II—II of Fig. 1; Fig. 3 is a vertical section taken along line III—III of Fig. 1; and Fig. 4 is a fractional sectional elevation showing modifications.

An inverted cup-shaped metallic member 1, terminating in a beading 2 of curved cross-section, provides suitable connecting means such as the perforated lugs 3, and has perforations 4 to accommodate the tie-bolt *a*. In Figs. 1, 2, and 3 the tie-bolt *a* comprises a central strength-giving member 5, preferably in the form of a steel bolt, surrounded by a sleeve 6 of insulating material such as mica-board, which projects beyond the ends of the member 5. In Fig. 4 the bolt *a* comprises a single member 7 of strong dielectric material such as compressed fiber.

The bolt *a* mechanically locks in position the eye-bolt 8, the eye-portion 9 of which has a cylindrical bore preferably fitted with a plurality of overlapping cylinders 10, 11 and 12 of high dielectric insulating material such as mica-board.

A sheet metal canopy 13 having perforations 14 is snapped over the cup-shaped member 1 to rest on the ledge 15, formed by a circular channeled in the outer wall of the cup portion 1 and beneath the overhanging ledge 16.

Suitable moldable insulating material such as electrose is forced and molded about the various parts of the insulator within the cup 1 and above and below and through the perforations 14 of the metal canopy 13, so as to form a petticoat portion 20, the under surface of which may be shaped into ridges 21, 22. In the construction of Fig. 1, the metal canopy 13 extends out beyond the petticoat 20 of insulating material and is finished by a beading 23.

The eye-bolt 8 has a collar 24 located adjacent the lower termination of the insulating material from which the insulator is molded. Its eye-portion 9 has a configuration approximately parallel to the inner face of the cup 1, to the end that all contour lines of the dielectric may correspond approximately to the flow lines of electro-static stress. This is not exactly true for the contour lines within the opening of the eye in the bolt 8, but at this locality an additional dielectric strength both against surface leakage and puncture is provided by the overlapping plural sections of tubular insulating material. The overhanging of the tube 4 beyond the end of the bolt 5 likewise necessitates a long leakage surface for any current which may tend to flow from the metallic bolt 5 to the cup 9. In the construction shown it is seen that the path opposed to current flow from bolt 8 to bolt 5 and thence to cup 1, has interposed in it five distinct dielectric barriers, while the direct path from the eye 9 to the cup 1 is opposed by a barrier of electrose, the contour lines of which correspond almost exactly to the flow lines of electro-static stress. In this manner, all the parts which cannot be properly designed to give maximum dielectric strength for the amount of material used are so designed as to give more than adequate dielectric strength in the locality otherwise subjected to non-uniform electro-static stress.

In Fig. 4 two modifications are illustrated, any one or both of which may form a part of an alternative or alternative embodiments like Fig. 1. In Fig. 4 the metallic canopy 13, instead of projecting outwardly beyond

the petticoat 20, is wrapped about the ridge 21 to form a beading 30. Also in this figure is to be noted that the bolt *a* is shown entirely of dielectric material, which might
 5 eliminate the necessity or the desirability of the plural over-lapping tubular sections of insulation 10, 11 and 12.

The insulator construction illustrated is one which adapts itself readily for use where
 10 high condensance is to be provided or to be built up. To this end the metal canopy 13 plays a large part and also structurally strengthens the entire structure.

What is claimed and what is desired to be
 15 secured by United States Letters Patent is:

1. A high-potential insulator comprising a conducting terminal having a flaring metal canopy; and a petticoat of insulating material, said metal canopy being embedded
 20 in said petticoat and serving to distribute electro-static stress and also to reinforce said petticoat.

2. A high-potential insulator comprising a conducting terminal having a flaring metal canopy provided with perforations; and a
 25 petticoat of insulating material, said metal canopy being embedded in said petticoat and serving to distribute electro-static stress and also to reinforce said petticoat.

3. A high-potential insulator, comprising a conducting terminal having a flaring metal canopy; and a petticoat of insulating material, said metal canopy being embedded in
 30 said petticoat throughout its central portion and having its outer margin exposed and serving to distribute electro-static stress and also to reinforce said petticoat.

4. A high-potential insulator comprising a cup-shaped metallic terminal; a flaring
 40 sheet metal canopy connected to said termi-

nal; and a body of insulating material forming a filling for said terminal and a flaring petticoat adjacent said canopy, whereby electro-static stress is distributed.

5. In a high-potential insulator the combination of a condenser-partition in the
 45 form of a metal fabric having openings, and an embedding wall of insulating material, whereby moldable dielectric may be built up into an insulator of the condenser type with
 50 the layers of dielectric on opposite sides of the partition substantially forming an integral part of the whole.

6. In a suspension insulator, an eye-bolt, a terminal having two openings on opposite
 55 sides of the eye of said eye-bolt; a tube of insulating material passing through said eye and projecting outwardly from both said openings; and a reinforcing metal rod in
 60 said tube but terminating short of its ends.

7. A high-potential strain insulator having eye-bolt and perforated yoke metal terminals; a metal tie-pin locking said eye-bolt
 65 terminal to said perforated yoke terminal; a filling of insulating material between said yoke-terminal and said eye-bolt terminal; and one or more sleeves of higher dielectric value than said filling interposed
 70 between said bolt and the adjacent parts of one or more of said terminals.

8. A high-potential strain insulator comprising two metal terminals; a tie-bolt for
 75 locking said terminals together; and a plurality of overlapping sleeves of insulating material interposed between said bolt and one of said terminals.

In witness whereof I have signed my name to this specification, this 26th day of January, 1917.

SOL S. SONNEBORN.