May 27, 1952 L. J. STEVENS 2,598,460

INSULATOR CAP

Filed April 14, 1950 2 SHEETS—SHEET 1

Fig. 1.

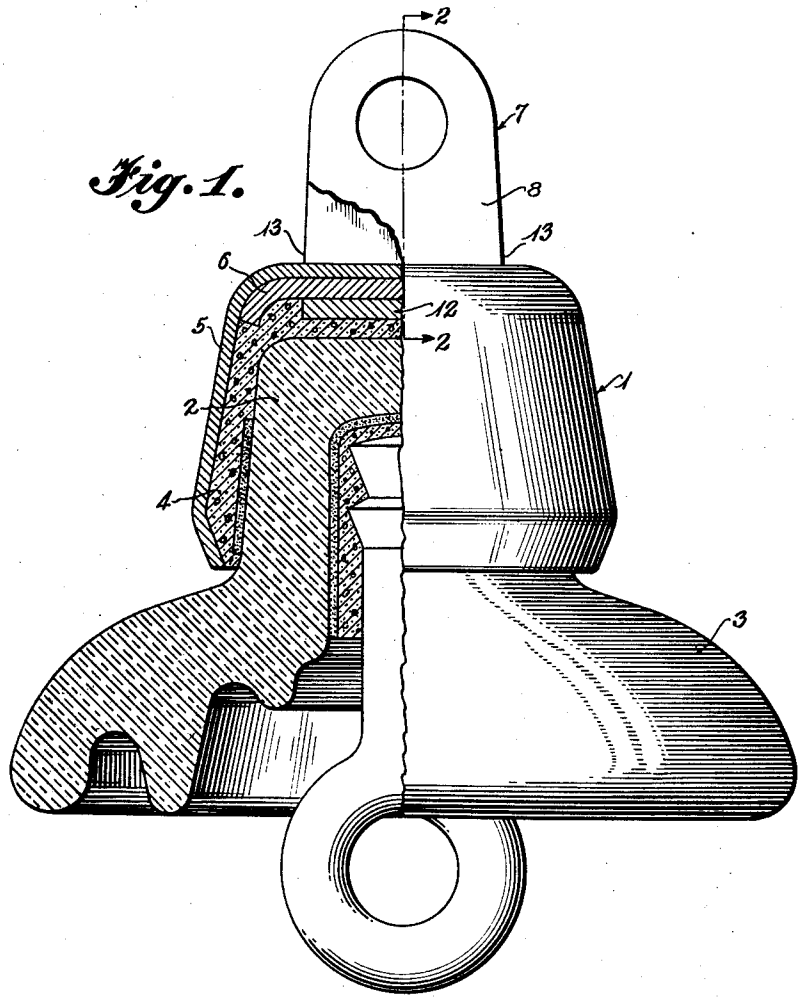
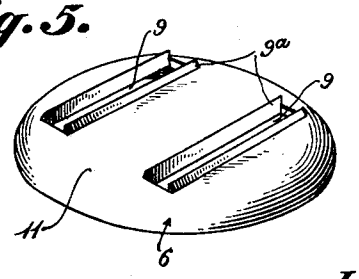


Fig. 5.



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Fig. 2.

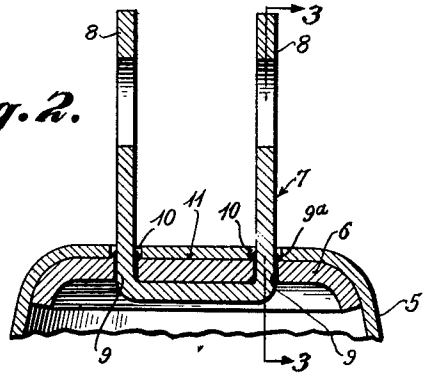


Fig. 3.

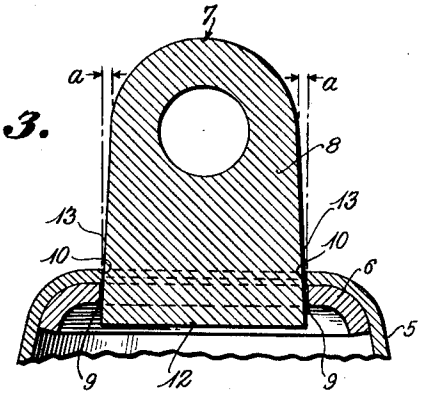
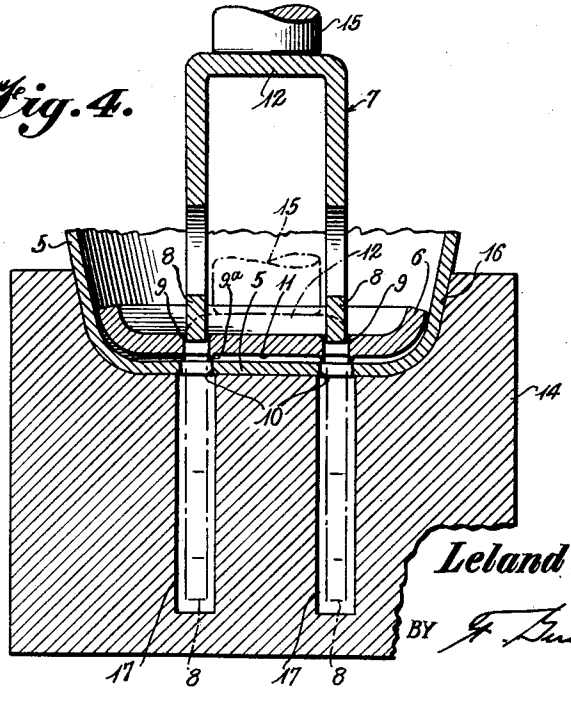


Fig. 4.



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INSULATOR CAP

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3 Claims. (Cl. 287—20.1)

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My invention relates to an insulator cap and more particularly to a multi-part insulator cap and the method of making said cap.

My invention has particular utility in connection with suspension type insulator units which consist of a ceramic body having a metal cap attached to a knob on top thereof and a pin fixed within a cylindrical hole on the opposite side from that on which the cap is located.

It is an object of my invention to provide a new insulator cap which may be assembled from relatively inexpensive pressed steel parts.

It is a further object of my invention to provide a light weight but structurally durable insulator cap of reinforced construction.

It is a still further object of my invention to provide a multi-part insulator cap, in which each of the parts thereof may be separately galvanized prior to assembly so that all surfaces thereof will be protected against adverse weather conditions to which they may be subjected in normal use.

Further objects and advantages of this invention will become apparent and the invention will be better understood from the following description referring to the accompanying drawing, and the features of novelty which characterize this invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

A feature of this invention is the formation of an insulator cap from three separate pressed steel parts which are held together as a unitary structure by the interaction of the parts. Because of the way in which my insulator cap is assembled, any strain on this cap during its normal use will tend to pull the respective parts of the cap into closer engagement with each other. Furthermore, since my insulator cap includes no soldered, welded, or riveted joints it eliminates the possibility of joint failure.

In the drawings Fig. 1 is an elevation view, partly in section, of a suspension type insulator having a preferred embodiment of my insulator cap attached thereto; Fig. 2 is a sectional view of a part of the cap shown in Fig. 1 taken on line 2—2 of Fig. 1; Fig. 3 is a view similar to that of Fig. 2 taken on line 3—3 of Fig. 2; Fig. 4 shows my insulator cap in process of being assembled; and Fig. 5 is a view in perspective of a preferred embodiment of the reinforcing plate which constitutes one part of my improved insulator cap.

As indicated in Fig. 1 of the drawings my improved insulator cap, which is indicated generally by the reference numeral 1, is attached to the knob 2 of a ceramic insulator 3. My cap may

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be attached to the insulator knob in any well known manner, such as by cementing it to the knob as is indicated at 4 in Fig. 1.

As may be seen by reference to the accompanying drawings, the cap 1 consists of a bell 5, a reinforcing plate or washer 6 and a clevis member 7. In all embodiments of my invention these three parts are assembled in the relationship shown in Figs. 2 and 3; that is, the reinforcing plate 6 is fitted within the closed end of bell 5, and the prongs 8 of clevis 7 extend through the slots 9 and 10 of the reinforcing plate 6 and bell 5 respectively.

The bell 5 is, as its name implies, a generally bell-shaped member and is provided at its closed end with two parallel slots 10.

The reinforcing plate 6 is preferably dish-shaped, having the contour of its outside surface conforming generally to that of the inside surface of the closed end of bell 5 so that it will fit snugly within (i. e. nest within) the closed end of the bell when these two parts are assembled.

The reinforcing plate 6 is provided with slots 9 which are similar in shape and size to the slots 10 in the top of the bell 5. In the reinforcing plate used in the preferred embodiment of my invention, I provide tapered projections or burrs 9a, which project in extension of the straight side walls of the slots 9 above the top surface 11 of the reinforcing plate 6, i. e. the surface which will be in contact with the inner surface of the closed end of the bell member 5. These projections 9a may be seen by referring to Fig. 5 of the drawings, and their purpose will be explained later.

The clevis 7 consists of two prongs 8 connected by a flat base 12 which forms the closed end thereof. In the preferred embodiment of my invention I make the edges 13 of the prongs 8 with a slight taper as indicated by the reference *a* in Fig. 3 so that the prongs decrease in width from the base, or closed end, toward the free end of the prongs. The amount of this taper is not critical so long as it is slight, but I prefer to use a taper of about one-sixteenth of an inch per inch.

The preferred embodiment of my invention is shown most clearly in Figs. 2 and 3. In these figures it will be noted that the reinforcing plate 6 is nested closely in contact with the inside surface of the closed end of bell 5. The slots 9 in reinforcing plate 6 are accurately aligned with the slots 10 in bell 5. The prongs 8 of clevis 7 pass through the slots 9 and 10, and the base, or closed end 12, of clevis 7 fits closely against

the lower surface of reinforcing plate 6. The projections 9a are wedged, i. e. staked, between the prongs 8 or clevis 7 and the side walls of slots 10 in bell 5. This wedging action of the projections 9a between the prongs 8 and the sidewalls of the slots 10 holds the three parts of my cap together and causes them to act as a unitary structure.

It will be understood of course, that in Fig. 2 the clearance between the prongs 8 and the sides of slots 10, as well as the size of the projections 9a, has been exaggerated for the purpose of clarity. In practice I prefer to make the slots 10 approximately 3 to 15 mils wider than the thickness of prongs 8 and to provide projections or burrs 9a which protrude approximately 15 mils above the upper surface 11 of plate 6.

In addition to the wedging action of the projections or burrs 9a against the prongs 8 and the sidewalls of slots 10, there is a wedging action between the tapered edges 13 of the prongs 8 against the ends of the slots 10 which also tends to bind the members of my cap into a unitary structure.

While I have shown the preferred embodiment of my invention as incorporating both the projections or burrs 9a, and the taper on the edges 13 of prongs 8, it is thought to be obvious that either one of these features alone will provide wedging action to hold the members of my cap together. Even in the absence of both the projections 9a and the taper of the prongs 8, the force fit between the clevis 7, the plate 6, and the bell 5 will tend to hold these three parts of my insulating cap together as a unitary structure.

Although the individual parts of my insulator cap may be made from any suitable material and in any suitable manner, I prefer to use pressed steel parts made in conventional cold pressing dies. With respect to the projections of burrs 9a, these may be formed in any suitable manner, but I prefer to form them concurrently with forming the slots 9 in the reinforcing plate 6 by punching these slots from the underside of the reinforcing plate, so that the drag of the punch, as it emerges through the top side 11 of the reinforcing plate, will produce burrs having a tapered cross section as shown in Fig. 2. This configuration of the burr provides especially effective staking action.

In Fig. 4 I show one embodiment of my insulator cap in a state of partial assembly, in connection with a jig 14 and ram 15 which may be used in assembling it. In using this jig and ram, the bell 5 is placed upside down in the contour-fitting depression 16 of the jig, with the slots 10 of the bell 5 aligned with the slots 17 in the jig. The reinforcing plate 6 is next placed in the bell with its outside surface 11 adjacent the inside surface of the closed end of bell 5, and the slots 9 are aligned with the slots 10. Next the clevis 7 is placed inside the bell 5 with its prongs 8 pointing downwardly, aligned with, and in contact with the edges of, slots 9, as indicated by solid lines in Fig. 4. The ram 15 is then brought to bear against the base 12 of clevis 7 and is caused to descend with sufficient force to drive said base against the reinforcing plate 6, as indicated by the dotted outline in Fig. 4, and also drive the burrs 9a between the clevis prongs 8 and the sidewalls of slots 10 to stake the parts together. The driving action of ram 15 also forces the tapered edges 13 of the clevis prongs into wedge relation with the end walls of slots 10.

It will be seen that I have provided a three part insulator cap in which the three parts are held together by interaction of the parts, no external means such as welding, soldering, or riveting being used. Because no such means is used for holding the parts of my insulator cap together I am enabled to galvanize the separate parts of my insulator cap before assembling them. This is highly advantageous since it insures that all exposed surfaces of all members will have a protective coating, whereas if the parts should be assembled before galvanizing there are almost certain to be areas between closely fitting parts which will not come in contact with the galvanizing solution, and hence will not receive the protective coating so essential to long life of hardware of this nature which is constantly exposed to the elements. If desired, and this will usually be the case, the interior of the assembly cap can be coated with a protective material, such as a bituminous base material, prior to applying the cap to an insulator.

Also because of the special arrangement of the parts of my insulator cap it will be noted that any pull on the clevis 7 in normal use will result in a closer drawing together of the parts of my insulator cap. Furthermore, it will be noted that the reinforcing plate 6, because of its contour-following contact with the inside surface of the closed end of bell member 5, serves to reinforce this area of the bell, and evenly distributes thereover any load transmitted by tension on the clevis 7.

While I have particularly described one embodiment of my invention and a method of making it, it will be understood that variations of the structure as well as the method of forming may be practiced without departing from the scope of my invention. Accordingly, I do not desire to be limited to the exact embodiment or method described in the specification but intend to cover such modifications thereof as may be apparent to one skilled in the art and which come within the spirit and scope of my invention.

Having thus described my invention, what is claimed and desired to be secured by Letters Patent is:

1. An insulator cap comprising a bell having slots extending through its closed end, a reinforcing plate within said bell nesting against the closed end thereof, said reinforcing plate having slots therethrough in alignment with the slots through said bell, said slots thru said reinforcing plate having burrs thereon extending into the slots in said bell, and a clevis having its closed end positioned against said reinforcing plate, said clevis having prongs extending through the aligned slots in said reinforcing plate and bell, said burrs being wedged between said prongs and the sides of the slots through said bell to lock said bell, reinforcing plate, and clevis together.

2. An insulator cap comprising a bell member having slots extending through its closed end, a reinforcing plate nested within said closed end, said reinforcing plate having slots therethrough in alignment with the slots in said bell member, said slots through said reinforcing plate having burrs on the edges thereof extending into the slots in said bell member, and a clevis having its closed end positioned against said reinforcing plate and having prongs extending through said slots in said reinforcing plate and said bell member, said prongs being wider at the base than at the free end thereof, the edges of said prongs near the wider end thereof engaging the ends

of said slots in said bell member with force fit.

3. An insulator cap comprising a bell member having slots extending through the closed end thereof, a reinforcing member nested within said closed end, said reinforcing member having slots extending therethrough in alignment with the slots in said bell member, a clevis positioned with its closed end against said reinforcing member, said clevis having prongs extending thru the aligned slots in said reinforcing member and said bell member, and burr members located within said aligned slots and alongside said clevis prongs, said burr members being wedged against said clevis prongs whereby said clevis is maintained in fixed engagement with respect to said reinforcing member and said bell member.

LELAND J. STEVENS.

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