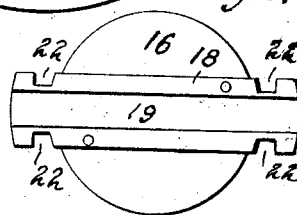
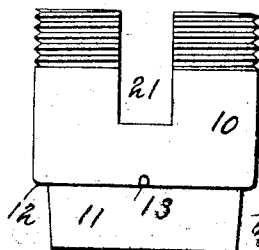
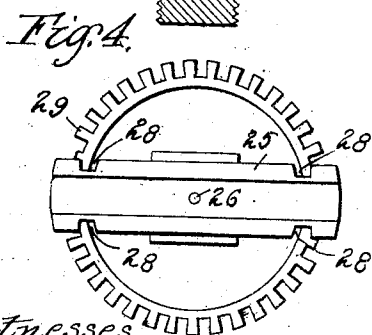
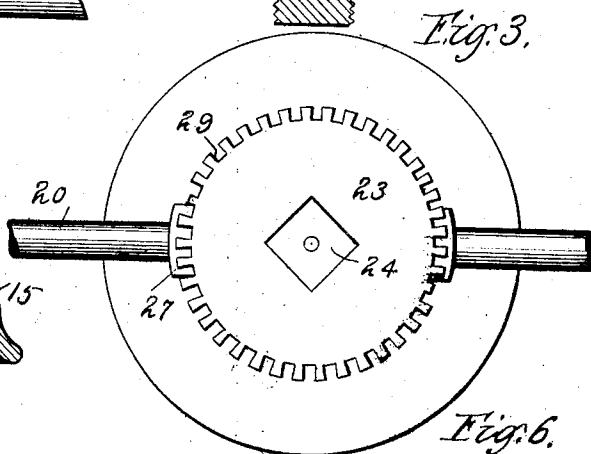
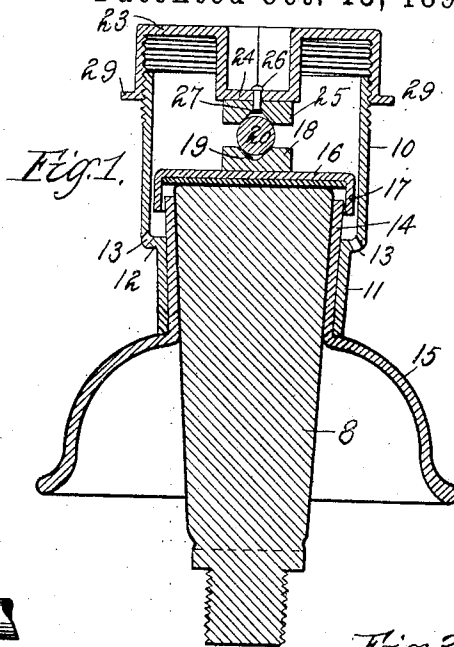
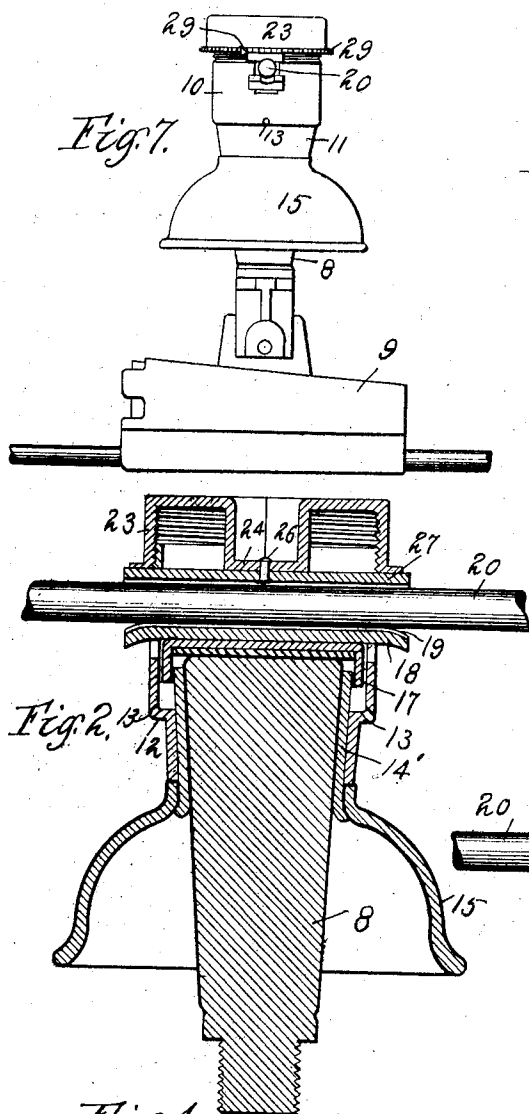


(No Model.)

J. W. MEAKER.
INSULATOR FOR TROLLEY WIRE SUPPORTS.

No. 547,931.

Patented Oct. 15, 1895.



Witnesses.
Wm. M. Pheasant
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Fig. 5.

Inventor

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UNITED STATES PATENT OFFICE.

JOHN W. MEAKER, OF EVANSTON, ILLINOIS.

INSULATOR FOR TROLLEY-WIRE SUPPORTS.

SPECIFICATION forming part of Letters Patent No. 547,931, dated October 15, 1895.

Application filed November 19, 1894. Serial No. 529,331. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. MEAKER, a citizen of the United States, residing at Evanston, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Insulators for Trolley-Wire Supports, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical cross-section. Fig. 2 is a longitudinal vertical section. Fig. 3 is a plan view. Fig. 4 is an underside view of the screw-cap. Fig. 5 is a detail, being a side elevation of the shell. Fig. 6 is a detail, being a plan view of the inner cap. Fig. 7 is an elevation showing a different method of attaching the bolt to the trolley-wire support.

My invention relates to devices for suspending trolley-wires used in overhead electric-railway systems, and has to do particularly with devices for insulating the trolley-wire supports.

As is well known, in overhead electric-railway systems it is customary to secure the trolley-wire in place by attaching it to a suitable support, the support being in turn connected by an insulator to a cross-wire suspended between posts at opposite sides of the road. Many forms of insulators have heretofore been devised for this purpose, the object being to provide an insulator which would be a perfect protection against leakage of the current, such insulators consisting, generally, of a bolt, to which the trolley-wire hanger was connected, and devices for supporting said bolt and protecting it from moisture. In order to more perfectly insulate the wire the bolts used heretofore have generally been covered with vulcanized rubber. The devices heretofore used have, however, been unsatisfactory for various reasons, among which may be mentioned the great expense and the difficulty which attended the adjustment of the insulator upon its supporting-wire, the latter objection being particularly important owing to the fact that it was frequently necessary to adjust the position of the insulator.

The objects of my present invention are to avoid the objections incident to insulators as heretofore constructed and to provide an improved insulator which may readily be adjusted which will be so constructed that it

may be readily applied to or removed from the wire, which will form a perfect protection against moisture and which will be durable and cheap to manufacture.

A further object is to provide an improved bolt for use in insulators.

I accomplish the objects of my invention as hereinafter specified and as illustrated in the drawings.

That which I regard as new will be set forth in the claims.

In the drawings, 8 indicates a bolt, which, as shown in the drawings, is conical in form, its lower end being arranged to be attached to a trolley-wire hanger 9. I prefer to make the lower end of the bolt 8 screw-threaded, so that it may be screwed to the hanger 9; but it may be slotted to receive a tongue carried by the hanger, as shown in Fig. 7, or may be attached to the hanger in any other suitable manner.

The bolt 8 may be of iron or other suitable material, and is coated with a suitable non-conductor, preferably a glass or other non-conducting enamel, such as that commonly used in the manufacture of enameled iron-ware. This makes the bolt a perfect non-conductor.

10 indicates a shell, the upper portion of which has a considerably greater diameter than the upper portion of the bolt 8, as shown in Fig. 1. Near its lower end the shell 10 is provided with a contracted portion 11, forming a circumferential shoulder 12, as shown. 13 indicates a series of perforations in said shoulder 12. The inner wall of the contracted portion 11 of the shell is inclined, making it substantially conical in form, as also shown in Fig. 1.

15 indicates a bell having at its upper portion a conical sleeve 14, which fits into the contracted portion 11 of the shell, and is so arranged as to project a short distance above the shoulder 12 when fitted into the shell, as shown in Figs. 1 and 2. By this construction a gutter is formed in the shell 10 above the contracted portion 11, so that any moisture collecting in the shell is confined to said channel and escapes through the orifices 13. The upper portion of said bell bears against the lower edge of the shell 10, and said shell and bell are firmly secured together by the

sleeve 14, its conical form preventing its withdrawal from the shell, as shown in Fig. 1. Before the parts are assembled the sleeve 14 is substantially cylindrical; but it is flared after it is fitted into the contracted portion of said shell and thereby caused to fit snugly in said shell. This may be done by a die or other suitable mechanism. The conical form of the sleeve 14 adapts it to receive the bolt 8, the relative sizes of the bolt and sleeve being such that when the bolt is fitted into said sleeve the upper end thereof will be slightly above the upper edge of said sleeve.

In Fig. 2 I have shown a modified arrangement of the sleeve 14 and bell 15, the shell being unchanged. In this form a separate sleeve 14' is used, which is conical in form to adapt it to fit into the contracted portion of the shell. Said sleeve is secured to the bell and the three parts thereby secured together by flaring the lower edge of the shell within the bell, as shown in Fig. 2.

16 indicates an inner cap having a circumferential flange 17, said cap being adapted to fit over the upper edge of the sleeve 14, as shown, the cap resting upon the upper end of the bolt 8. The exterior diameter of the cap 16 is, however, slightly less than the interior diameter of the upper portion of the shell 10, so as to permit the moisture to escape downward.

18 indicates a plate, which is secured upon the upper side of the cap 16. The plate 18 is provided with a longitudinal recess 19, adapted to receive a wire 20. The ends of the plate 18 are adapted to project through slots 21 in opposite portions of the shell 10, as best shown in Fig. 2, said slots being preferably narrower than the plate 18, which is provided with suitable notches 22 to receive the edges of the shell. By causing the ends of the plate 18 to project through the slots 21 the cap 16 is prevented from turning when the insulator is applied to the wire, as will be hereinafter described.

23 indicates an outer cap, which is internally screw-threaded and is adapted to screw upon the upper end of the shell 10, which is also screw-threaded, as shown in the drawings. The cap 23 is provided with an inwardly-projecting portion 24 at the center, which is preferably square, forming a square depression in the cap to adapt it to receive a suitable tool, so that the cap may be forcibly screwed upon or unscrewed from the shell 10. Instead, however, of making the hole square, it may be made of any other non-circular form.

25 indicates a plate similar to the plate 18, said plate 25 being pivoted by a pivot 26 or other suitable device to the inwardly-projecting portion 24 of the cap 23. The plate 25 is provided with a depression 27 to adapt it to fit upon the wire 20. The plate 25 also projects through the slots 21 and is provided with recesses 28, similar to the recesses 22.

The insulator is adjusted in the following manner: The bolt 8 being fitted into the shell, the cap 16 is placed upon it, the plate 18 projecting through the slots 21. The wire 20, from which the device is suspended, is then placed in the recess in the plate 18, and the cap 23 is placed over it, the plate 25 lying over the wire. By then screwing the cap 23 downward the insulator may be tightly clamped to the wire. It is evident that for adjusting the position of the insulator upon the wire it is only necessary to slightly unscrew the cap 23, when the device may be adjusted as desired. By making the cap in the form described, practically all moisture is kept out of the shell; yet should any gain access to it it is permitted to escape through the openings 13. Furthermore, when the insulator is clamped upon the wire the pressure upon the upper end of the bolt 8 serves to wedge it tightly into place, and thereby prevents it from becoming loose.

In order to prevent the cap 23 from accidentally unscrewing or working loose, it is provided with a series of lugs or teeth 29, which project at right angles from its lower edge, as shown in Figs. 1 and 3. When the cap has been screwed into place, those of such lugs which lie adjacent to the opposite ends of the plate 25 are bent downward over against the edges of said plate, as best shown in Figs. 3 and 7. In this way the unscrewing of the cap 23 is prevented.

The bell 15 serves to conduct away water which drips upon the insulator, and in order to avoid possible leakage of the current through the formation of icicles said bell is also coated with non-conducting enamel. This not only makes it a non-conductor, but also presents a smooth surface to the moisture and prevents it from accumulating on the bell, which is objectionable.

The great extent of the bearing surface secured by making the bolt wedge-shaped prevents it from turning in its socket when it is secured therein, which is an important advantage, as it greatly facilitates the proper adjustment of the hanger.

That which I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with a shell having a contracted lower portion, of a sleeve engaging the contracted portion of the shell, and having its upper end rising above said contracted portion, and a bell suspended by the sleeve, substantially as described.

2. In an insulator, the combination with a shell having a contracted lower portion, of a sleeve engaging the contracted portion of the shell, and having its upper end rising above said contracted portion, a bell suspended by the sleeve, and a bolt also suspended by the sleeve, substantially as described.

3. In an insulator, the combination with a shell having a contracted lower portion, of a sleeve engaging the contracted portion of the

shell, a bell suspended by the sleeve, and a bolt also suspended by the sleeve, substantially as described.

4. In an insulator, the combination with a shell, of a conical sleeve engaging the shell, a bell suspended by the conical sleeve, and a conical bolt also suspended by said conical sleeve, substantially as described.

5. In an insulator, the combination with a shell, and a conical sleeve engaging the interior of the shell, of a bell suspended by the sleeve, a conical bolt engaging the conical sleeve, and devices for exerting downward pressure upon the bolt to hold it firmly in the conical sleeve, substantially as described.

6. In an insulator, the combination with a shell, and a conical bearing therein, of a conical bolt fitting said bearing and supported by the shell, a cap fitting over the upper end of the bolt, a wire 20, and means for clamping the said wire upon the cap and forcing the cap downward upon the upper end of the bolt, substantially as described.

7. In an insulator, the combination with a shell, and a bolt adapted to fit therein, of a cap adapted to fit over said bolt, a wire 20, and a screw cap for clamping said wire upon said cap, substantially as described.

8. In an insulator, the combination with a shell, and a bolt adapted to fit therein, of a cap adapted to fit over said bolt, a wire 20, and a screw-cap for clamping said wire upon said cap, said screw-cap having an inwardly projecting portion 24, substantially as described.

9. In an insulator, the combination with a shell, and a bolt adapted to fit therein, of a cap adapted to fit over said bolt, a wire 20, a screw-cap for clamping said wire upon said cap, and means for preventing said screw-cap from accidentally unscrewing, substantially as described.

10. In an insulator, the combination with a shell, and a bolt fitted therein, of a wire 20, and a screw-cap mounted on the shell and exerting pressure on the wire in the direction toward the bolt for clamping said wire between said cap and the bolt, substantially as described.

11. In an insulator, the combination with a shell, and a bolt fitted therein, of a wire 20, and a cap above said wire, whereby the wire may be clamped between the cap and the bolt, substantially as described.

12. The combination with a shell having a contracted lower portion, of a bell formed integral with a sleeve which fits the interior of the contracted portion of the shell, substantially as described.

13. An insulator, consisting of a shell open at the top a sleeve engaging the interior of the shell, a bell suspended by the sleeve, a bolt engaging and supported by the sleeve, and a cap arranged over the upper end of the bolt, substantially as described.

14. In an insulator, the combination with a shell, and a bolt suspended therefrom, of a screw-cap fitting the shell, clamp-plates projecting through the shell, and lugs for preventing accidental unscrewing of the cap, substantially as described.

15. In an insulator, the combination with a shell, and a bolt fitted therein and supported thereby, of wire clamping plates having their extremities projecting through the shell, one of said plates resting upon said bolt, and means for causing the clamping plates to clamp or grip the wire, substantially as described.

16. In an insulator, the combination with a shell, and a bolt suspended therefrom, of wire clamping plates having their extremities projecting through said shell, one of said plates resting upon said bolt, and a screw-cap fitting the shell for causing the clamping plates to clamp or grip a wire, substantially as described.

17. In an insulator, the combination with a shell, and a bolt suspended therefrom, of a screw cap fitting the shell and having lugs, and a projection extending from the shell and against which one of the lugs is adapted to be engaged for preventing the unscrewing of the cap, substantially as described.

JOHN W. MEAKER.

Witnesses:

A. H. ADAMS,
C. E. PICKARD.