

(No Model.)

H. E. BILLINGS.
INSULATOR.

No. 576,392.

Patented Feb. 2, 1897.

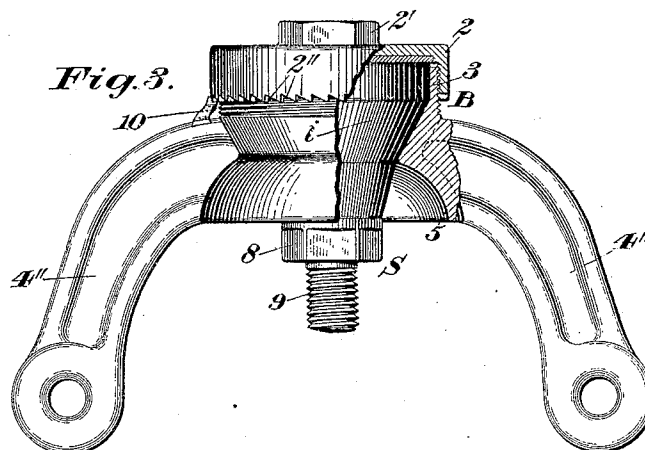
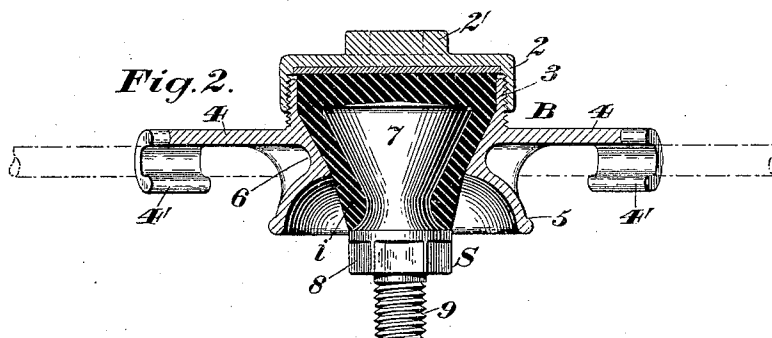
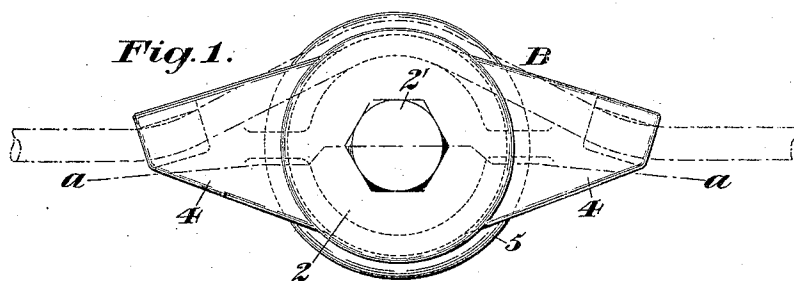
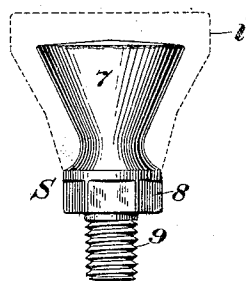


Fig. 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

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INSULATOR.

SPECIFICATION forming part of Letters Patent No. 576,392, dated February 2, 1897.

Application filed November 21, 1896. Serial No. 612,919. (No model.)

To all whom it may concern:

Be it known that I, HARRY E. BILLINGS, a citizen of the United States, residing in Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Insulators, of which the following is a specification.

This invention relates to insulators; and it has for its main object the provision of an improved insulating-hanger for supporting a high-tension main—such, for example, as the line-wire or working conductor of an overhead system of electrical distribution—from a suitable guy-wire or cross-wire secured to a support or supports remote from the line-wire.

In the drawings accompanying and forming part of this specification, Figure 1 is a plan of an insulator constructed in accordance with my present improvements, this view showing a straight-line hanger for an overhead conductor. Fig. 2 is a longitudinal section of the same, the section being taken in line *a a*, Fig. 1. Fig. 3 is a sectional side elevation showing my improvements applied to an insulator of the type known as a “double pull-off hanger;” and Fig. 4 is a detail side elevation illustrating the metallic insulating-stud of the hanger, the insulation therefor being indicated by dotted lines.

Similar characters designate like parts in all the figures of the drawings.

Referring first to Figs. 1, 2, and 4, B designates in a general way the body portion of guy-wire-supported member of an insulator or line-wire hanger embodying my present improvements. In this case the main body has a transverse opening therein which tapers toward the shank of the stud that it is adapted to receive, this opening being illustrated in the present case as funnel-shaped and as having its contracted neck adjacent to the point where a deflector 5 of a well-known type is attached at its small end to the body of the insulator, this deflector being in the present instance integral with such main body.

For the purpose of closing the large end of the opening in the body of the insulator I may make use of a cap 2, internally screw-threaded and adapted to be screwed onto an

externally-screw-threaded annular flange 3, rising from the upper face of the body portion of the insulator. This cap 2 may have a suitable nut 2', integral therewith, for enabling the cap to be screwed more readily onto and off from the flange 3.

For the purpose of attaching the insulator to a guy-wire the usual arms 4 4 of a straight-line hanger may be used, these having at their outer ends guides 4' 4', through which and a groove 6, encircling the body of the insulator, the guy-wire is passed in a manner indicated by the dotted lines in Figs. 1 and 2, respectively.

The line-wire-supporting member or insulating-stud of my improved insulator may be of any desired construction, except as to the head thereof. In the present instance this stud, which is designated in a general way by S, has the usual screw-threaded end 9 for securing thereto a trolley-clamp, (not shown,) and it also embodies a stud-head 7 and a hexagonal head 8, by means of which the stud may be screwed into the trolley-clamp.

It will be noticed that the nut 2' and the bolt-head 8 are of the same size and of the hexagonal type, thus permitting the manipulation of both by the use of a single wrench or spanner.

The head of the stud S tapers toward the shank thereof, it being preferably conical and having its sides substantially parallel with the walls of the opening in the body portion of the device when the parts of the insulator are assembled. This head should of course be insulated from that portion of the insulator which is supported by the guy-wire, and the medium which is employed for this purpose is indicated by *i* in the drawings. This insulating medium will be of high resistance and of sufficient strength to withstand the strain due to the pull of the stud S when in position for supporting a line-wire of a trolley system. The insulating material known as “colophite” meets these requirements, and hence constitutes a suitable insulation for separating the body portion of the insulator from the line-wire-supporting stud. This insulating medium is advantageously applied to the head of the stud S in such a manner as to form with the metallic stud a unitary

device, the insulation being of sufficient thickness to prevent the passage of a high-tension current from the stud to the body of the insulator. Moreover, this insulating medium

5 will be so shaped as to fill the opening in the body B when the parts are assembled, the insulation preferably extending to the upper side of the hexagonal head 8 and completely surrounding the head 7.

10 Between the head of the cap 2 and the insulating material I prefer to place a disk or washer, of leather or similar material, for the purpose of distributing evenly any pressure that may be exerted upon the upper side of

15 the insulation and which might tend to crack or chip the same.

It will be apparent, now, that if the parts be assembled, as shown in Fig. 2, with the body of the insulator supported by a guy-wire and the stud screwed to the trolley-clamp,

20 which in turn is fastened to the line-wire, any pressure that may be exerted upon the stud by the pull of the working conductor will be transferred to a very large surface of the insulating medium and will cause the latter to be compressed between the head of the stud and the walls of the opening in the body portion by the wedging action due to the downward pull upon the stud, and hence, while

30 the stress exerted by the stud will tend to bind or wedge the parts firmly together, it will be impossible for the head of the stud or the walls of the opening in the body B to cut the insulation and cause the grounding of the

35 current.

In Fig. 3 I have illustrated a modification of my invention in which the insulator is in the form of a double pull-off hanger. In this view the parts are substantially the same as those shown in Figs. 1, 2, and 4, respectively,

40 except that the arms 4" 4" are substituted for the straight arms 4 4 of the straight-line hanger and that an improved form of cap is employed for closing the tapered opening in the insulator. This cap constitutes, in combination with the body of the insulator, one of the features of my present improvements, both of these members being screw-threaded and one of them having a circuit of teeth,

45 while the other is provided with a stop-pawl or locking-pawl adapted to engage one of the teeth of said circuit, when the cap has been

screwed tight, and to hold the cap so that it will not be loosened by the shaking or vibration of the conductors and guy-wires of the

55 overhead system.

In the present application the cap 2 has a circuit of ratchet crown-teeth, which teeth are designated by 2", while one of the arms 4" of the insulator has secured thereto a

60 spring-tongue in the form of a spring-pressed pawl, so positioned that the free end thereof will slip over the teeth 2" when the cap is screwed onto the body portion B of the insulator, but will engage one of said teeth and

65 prevent the loosening of the cap when any force is exerted by the overhead wires to unscrew the cap.

It will be obvious, of course, that when it is desired to remove the cap from the body

70 B the pawl 10 may be pressed down out of engagement with the teeth of the cap, whereupon the cap may be unscrewed in the usual way.

Having described my invention, I claim—

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1. An insulator comprising a body portion having a tapered, transverse opening extending therethrough; a cap for closing the large end of said opening; a deflector carried by the body portion of the insulator; and a unitary line-wire-supporting insulator-stud having a screw-threaded end, a head tapered toward its shank to correspond with the taper of the opening in the body, a polygonal head between said screw-threaded end and the tapered head and adapted to be engaged by a wrench or similar tool, and an insulating medium of high resistance surrounding said tapered head and similarly tapered and adapted to fill the space between such head and the

80 walls of the tapered opening.

2. In a trolley-hanger, the combination, with a line-wire-supporting insulator-stud, of a screw-threaded cap having a circuit of ratchet crown-teeth; a screw-threaded body

85 portion having a spring-pressed stop-pawl adapted to engage one of said teeth, to prevent loosening of the cap; and a deflector carried by said body portion and surrounding the insulator-stud.

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