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STORM ATTACHMENT FOR HIGH LINE TOOLS

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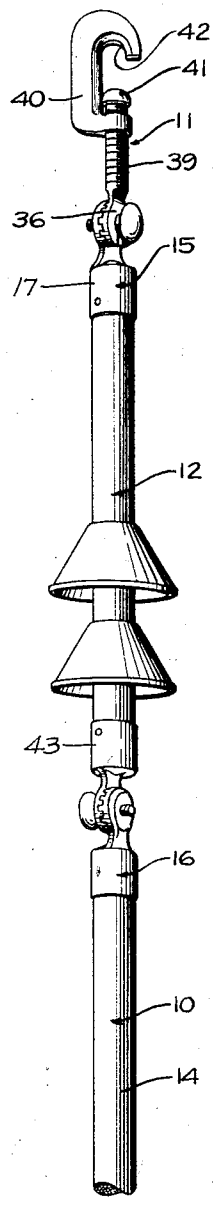


Fig. 1

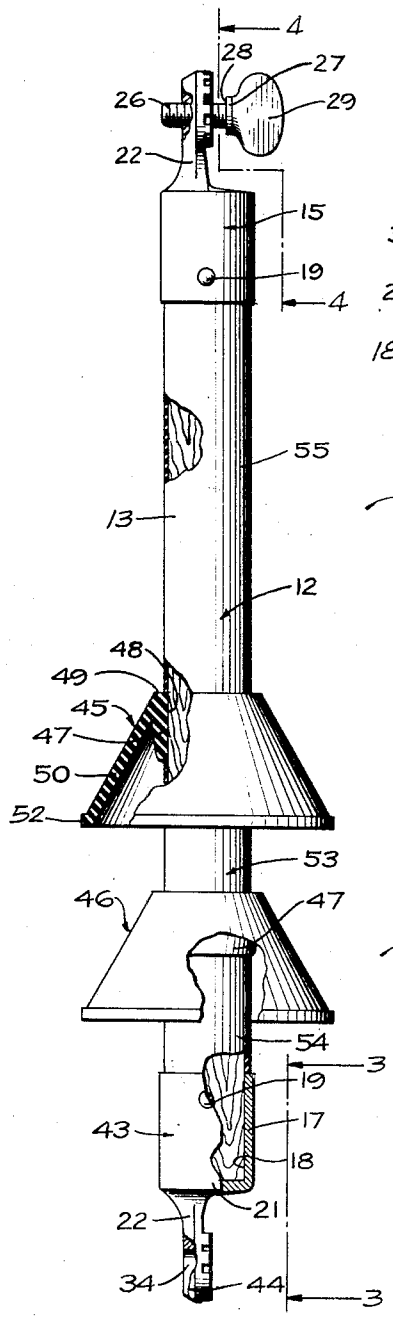


Fig. 2

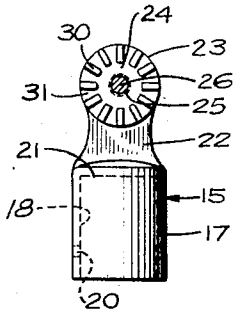


Fig. 4

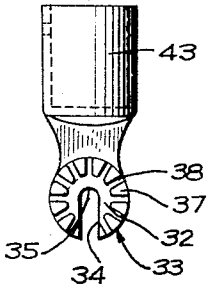


Fig. 3

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STORM ATTACHMENT FOR HIGH LINE TOOLS

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3 Claims. (Cl. 174—138)

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The present invention relates to storm attachments for high tension lines, and is particularly concerned with the provision of an attachment adapted to be used upon the so-called "universal" tools for high tension lines so that such tools may be used with assured safety when it is raining.

Such high line tools are already provided in many different forms and of such structure that they are adapted to be attached to a single pole, which is commonly called a "universal" pole. The poles are usually made of well dried, laminated spruce, which is carefully selected, and which is varnished with a varnish having electrical insulating characteristics, but the ordinary poles of the prior art are not safe to use in the rain because the water running down the pole is apt to cause a short circuit to ground through the operator.

One of the objects of the invention is the provision of an improved attachment adapted to be interposed between the tool end of a so-called "universal" pole and any one of a multiplicity of different types of tools that may be used on high tension lines, the attachment being adapted to provide adequate insulation, even when it is raining.

Another object of the invention is the provision of an improved attachment of the class described, which is relatively simple and small so that it may be carried in the tool box with the tools and so that it is unnecessary to provide a special storm pole or special storm tools for work under rainy conditions.

Another object of the invention is the provision of an improved attachment of the class described which is sturdy and adapted to withstand the abuse to which it is apt to be subjected when carried in a lineman's tool box, and which is adapted to be manufactured at a low cost so that it may be widely used in the trade.

Another object of the invention is the provision of an improved attachment for effecting insulation of tools for high tension lines of all kinds, even when the tool is being used under rainy conditions.

Other objects of the invention will be apparent from the following description and the accompanying drawings, in which similar characters of reference indicate similar parts throughout the several views.

Referring to Fig. 1, this is a fragmentary elevational view showing the end of a "universal" pole for tools for high tension lines in connection with an attachment embodying my invention and one form of tool;

Fig. 2 is a side elevational view of the storm attachment of Fig. 1 showing it apart from the tool and pole, in partial section, to reveal its structure;

Fig. 3 is a side elevational view taken from the

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right side of Fig. 2, showing the attaching fixture which is utilized at the bottom of the attachment;

Fig. 4 is a side elevational view in partial section on the plane of the line 4—4 of Fig. 2, showing the attaching fixture which is utilized at the top of the storm attachment.

Referring to Figs. 1 and 2, 10 indicates in its entirety a so-called "universal" pole of the type which may be utilized with a multiplicity of different tools, one of which is indicated in its entirety by the numeral 11. The storm attachment, which is the subject of the present invention, is interposed between the pole 10 and tool 11, and is indicated by the numeral 12.

The storm attachment 12 comprises a wooden pole, preferably round, which may be relatively short in length, such as, for example, in one case the pole is one and one-fourth inches in diameter and substantially fifteen inches long.

This pole, which is indicated by the numeral 13, is, like the pole 14 of the member 10, constructed of laminated spruce, and treated and tested to withstand 75,000 volts per foot for five minutes. The wood is carefully dried, and after all moisture is removed it may be covered with an electrically insulating varnish to exclude the moisture and to improve its insulating characteristics still further.

At its upper end the pole 13 is preferably provided with a standard "universal" pole fixture 15, which is of substantially the same structure as the "universal" pole fixture 16 that is carried by the end of the "universal" pole 10. These two fixtures 15 and 16 are preferably made of cast metal, such as high strength bronze, and the fixture has a substantially cylindrical body 17 provided with a cylindrical socket 18.

The cylindrical socket has a tight frictional fit on the cylindrical end of the pole 13, where the fixture is pinned by means of a transverse rivet 19, which passes through the holes 20 in the sleeve-like body 17 and in the end of the pole 13.

The upper end 21 of the body 17 is closed, and at one side the fixture 15 is provided with an axially projecting neck or column 22, which may taper upwardly to a substantially circular attaching flange 23. The attaching flange 23 is provided with an engaging face 24 that has a centrally located threaded bore 25 for receiving the clamping screw bolt 26.

The screw bolt 26 is preferably of the type adapted to be actuated by the fingers, having a circular head 27, with an annular clamping surface 28, and the head is provided with a flat finger-engaging portion 29.

The engaging face 24 of the column 22 is preferably provided with a multiplicity of radially extending lugs 30, separated by grooves 31. In this respect the engaging surface 24 is substan-

tially complementary to the engaging face 32 of the attaching flange 33 on the tool 11.

The attaching flange 33 on the tool 11 is a substantially circular flange provided with an axially inwardly extending slot 34 located in its end and extending inward past its center, where it terminates in a cylindrical end wall 35. Slot 34 is adapted to receive the shank of the bolt 26, and the flange 33 is preferably provided with a plane thrust surface 36 on the side opposite to the engaging face 32.

The thrust surface 36 is engaged by the annular shoulder 28 on the head 27 of bolt 26. As distinguished from the lugs 30 on the fixture 15, which lugs are preferably substantially rectangular in elevation, the lugs 37 on the attaching flange 33 of tool 11 are of substantially the same shape as the grooves 31, to which they are complementary. The lugs 37 are separated by grooves 38, which are complementary to the lugs 30 on the fixture 15.

The lugs and grooves on both of these engaging faces may obviously be changed in form considerably as long as they are adapted to interlock and prevent relative rotation between the attaching flange 33 of the tool and the attaching flange 23 of the fixture.

Thus, the tool 11 may be placed on the fixture 15, the slot 34 receiving the bolt 26, and the attaching flange 33 being clamped against the attaching flange 23 by the annular surface 28 of the bolt when the bolt is driven home in a clockwise direction.

The tool 11 is merely exemplary of a form of screw clamp which is adapted to be used for the end of a link stick, that is, a stick which is used to support a line conductor after the conductor has been removed or released from its insulator. Thus, the attaching flange 33 of this tool is carried by a threaded shank 39, which is located in a threaded bore in the clamp body 40 so that the head 41 may be moved toward the hook-like formation 42 on the clamp 40 to engage and hold a line conductor or some other energized part.

The present storm attachment, like "universal" poles, may be utilized for a vast number of different types of tools, such as, for example, wrenches, chucks, screw drivers, brushes, hooks, cotter key tools, tie stick heads, clampstick heads, fuse pullers, saws, mirrors, disconnects, wire tong heads, knives, splicing tools, etc.

The opposite end of the pole 13 of the attachment 12 is provided with a fixture 43, having a similar body member 17 provided with a bore 18 and a closed end 21 and secured on the pole by a similar rivet 19. In this case, however, the axially projecting column 22, which is located on one side of the end 21, has an attaching flange 44, which is similar in shape and structure to the attaching flange 33 previously described.

It differs from the attaching flange 23 in that it has a slot 34 extending axially into the flange 44 instead of the threaded bore 25 for receiving the screw bolt 26, as in the case of the fixture 15. In other words, the lower fitting 43 has its attaching flange like the lower end of a tool 11. The fixture 15 may be identical in structure with the fixture 16 that is used on the upper end of the "universal" pole 10, to which the fitting 16 is secured in the same way previously described.

The length of the pole 10 may obviously be as long as is necessary to make the pole suitable for the voltage on which the operator is going to use it. Therefore, the pole is shown broken off at its lower end so that its length is indeterminate.

Thus, the fixture 43 is adapted to be secured to the fixture 16 of the "universal" pole 10, while the fixture 15 is adapted to be secured to the supporting flange of any suitable type of tool.

The pole 13 of the attachment 12 is preferably provided with a plurality of insulating skirts 45, 46. In the embodiment illustrated, two such skirts are shown, but obviously, one, two, three, four, five, six, or any number of such skirts may be employed. Two such skirts are considered sufficient for an attachment to be used upon high tension lines under rainy conditions, when the lines carry 22,000 volts.

The skirts 45, 46 may be identical, and they are preferably constructed of soft, resilient, flexible, non-porous rubber. Each skirt has a centrally located supporting sleeve 46, which has a bore 48 of slightly smaller size than the pole 13, which it is intended to receive, so that it is adapted to have a tight frictional grip on the pole.

The sleeve 46 may taper downwardly and may be provided with a plane annular surface 49 at its upper end, where it is integrally attached to and supports a depending frusto-conical skirt 50. The skirt 50 extends downwardly and outwardly and may terminate in the substantially cylindrical outer edge 52, both of which are spaced considerably from the outer surface of the pole 13.

The two skirt members 45 and 46 are preferably spaced from each other by a substantial distance, and the pole 13 between them is preferably covered with a protective sleeve 53 of phenolic resin tubing, which fits tightly against the external surface of the pole 13.

As an example of the spacing, sleeve 53 between the skirt members 45, 46 may be substantially six inches long. Another such sleeve 54 extends downwardly from the lower edge of the supporting sleeve 47 of skirt member 46 and abuts against the sleeve 17 of the fixture 43.

Another such insulating sleeve, indicated at 55, extends upwardly from the top 49 of uppermost skirt member 45 to the bottom of fixture 15.

The phenolic resin tubing is nonhydroscopic in characteristics, and all joints between fixtures and sleeves and skirt members are preferably sealed with a suitable varnish or other suitable electrical insulating material so that the dry wood of the pole 13 will never increase its low moisture content, although the tool is used in the rain.

If desired, the entire attachment may be covered with a water repellent by means of which water will be caused to form in drops which will quickly run off and never wet the attachment overall.

The electrically insulating hoods or skirts 45, 46 are adapted to break up any water stream caused by rain, and to maintain a dry portion of the sleeves 53 and 54 underneath the hoods so that there will not be a direct wet path from the live end of the tool to the handle along which the electricity may travel. Dry areas will be interposed between the portions that are wet, thus impeding the flow of current under all conditions and substantially preventing the flow of current under predetermined conditions for which the attachment is constructed.

It will thus be observed that I have invented an improved storm attachment by means of which insulating poles and tools may be used to perform certain necessary operations in the rain, without having to resort to a special tool set for rainy work. The adaptability of this storm attachment to use with "universal" poles and tools

represents a great saving to the user and greatly reduces the space required on the truck for storm tools.

Several of these storm adapters of different characteristics may be kept in a small compartment for use with standard tools, whenever the need arises.

In some embodiments of the invention the insulating skirt members may be constructed out of nonhygroscopic, water repellent, heat moldable plastics of electrical insulating characteristics, but the resilient, bendable, natural rubber or various types of synthetic rubbers, are preferred because of the tendency to resist breakage; and if de-formed in being packed away under pressure, the skirts naturally come back to their proper form when the tool is removed from the box.

While I have illustrated a preferred embodiment of my invention, many modifications may be made without departing from the spirit of the invention, and I do not wish to be limited to the precise details of construction set forth, but desire to avail myself of all changes within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a storm attachment for high line tools, the combination of a wooden insulating pole of substantially cylindrical shape having a metal fitting at one end adapted to be used for attaching any of a plurality of different tools, said fitting comprising a ferrule fixedly secured on the pole and an axially extending partially circular flange having a threaded bore provided with a clamping screw bolt, a complementary fitting carried by the other end of the pole, including a metallic ferrule and an axially extending slotted flange of partially circular shape adapted to receive the clamping screw bolt of a tool supporting pole having a fitting similar to the first-mentioned fitting, the said wooden pole being provided with a plurality of self-draining insulating skirts of resilient bendable material, each skirt having a substantially frusto-conical depending portion and an integral tubular collar having a tight frictional grip on said pole, that portion of the pole above said skirts being provided with an insulating covering whereby the said attachment may be utilized on line poles to hold tools in wet weather without substantial danger of leakage of electricity along the pole due to the dry gaps provided beneath said skirts.

2. In a tool for manipulation of energized high tension line tools during wet weather, the combination of an elongated insulating wooden pole with a removable storm attachment for said pole, said insulating pole and storm attachment being provided with complementary angularly adjustable securing means at their adjacent ends, whereby they may be secured together for use of tools with a storm attachment, said storm attachment having at its other end a line tool, said line tool and storm attachment being secured together by complementary angularly adjustable securing means, and said storm attachment comprising an insulating wooden pole extending between the securing means on said storm attachment, and being provided intermediate its length, beginning at its outer end with an insulating and moisture-resistant sleeve covering said wooden pole, said sleeve extending to and abutting against a resilient, deformable, and unbreakable sleeve having a tight frictional fit on said wooden pole of said storm attachment, and having extending downwardly and outwardly therefrom a frusto-conical skirt, said skirt causing moisture which gathers thereon to be drained outwardly from the outer edge thereof, and said skirt maintaining a dry condition of the adjacent pole under the skirt, whereby the tool may be safely used during wet weather upon energized conductors of predetermined energization.

3. In a tool for manipulation of energized high tension line tools during wet weather, the combination of an elongated insulating wooden pole with a removable storm attachment for said pole, said insulating pole and storm attachment being provided with complementary angularly adjustable securing means at their adjacent ends, whereby they may be secured together for use of tools with a storm attachment, said storm attachment having at its other end a line tool, said line tool and storm attachment being secured together by complementary angularly adjustable securing means, and said storm attachment comprising an insulating wooden pole extending between the securing means on said storm attachment, and being provided intermediate its length, beginning at its outer end with an insulating and moisture-resistant sleeve covering said wooden pole, said sleeve extending to and abutting against a resilient, deformable, and unbreakable sleeve having a tight frictional fit on said wooden pole of said storm attachment, and having extending downwardly and outwardly therefrom a frusto-conical skirt, said skirt causing moisture which gathers thereon to be drained outwardly from the outer edge thereof, and said skirt maintaining a dry condition of the adjacent pole under the skirt, and a second resilient, deformable sleeve having a tight frictional fit on the same wooden pole and having its downwardly and outwardly extending frusto-conical skirt located below the first-mentioned skirt to provide a second dry area on the same pole under said second skirt for a factor of safety, whereby the tool may be safely used during wet weather upon energized conductors of predetermined energization.

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