Aug. 4, 1942. J. J. TAYLOR 2,291,846

FITTING FOR ELECTRIC INSULATORS

Filed June 21, 1940

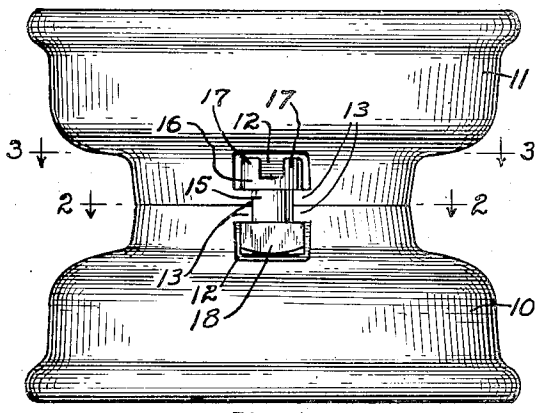


Fig. 1.

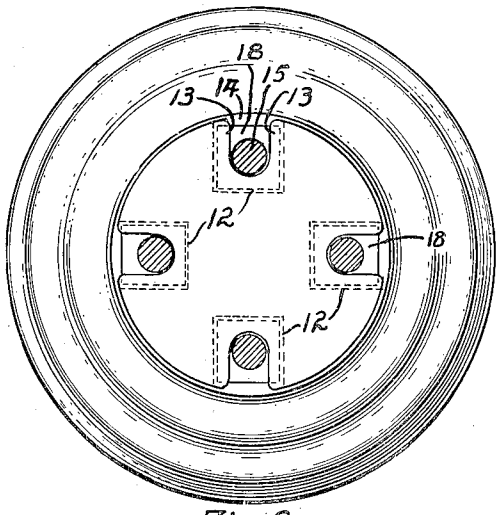


Fig. 2.

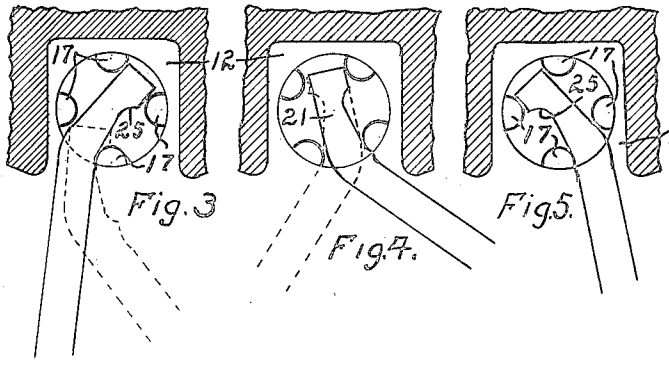


Fig. 3 Fig. 4. Fig. 5.

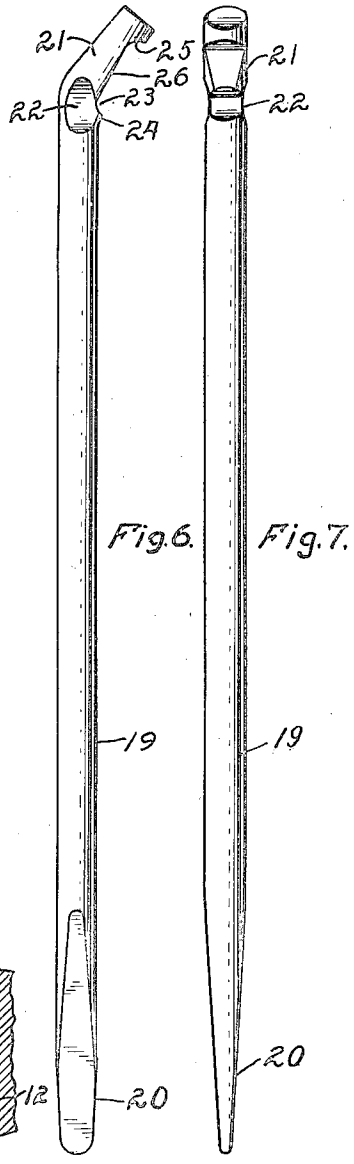


Fig. 6. Fig. 7.

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FITTING FOR ELECTRIC INSULATORS

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6 Claims. (Cl. 174—150)

This invention relates to fittings for electric insulators and particularly to means for directly connecting slotted caps of two adjacent insulators in a built up post or column. One object of the invention is to provide means for fastening two slotted insulator caps together face to face.

Another object of the invention is to provide a bolt and nut that can be operated in counterpart slots in contiguous faces of connected insulator caps together with a tool for operating said bolt and nut.

A further object of the invention is to provide apparatus of the class described that will be of improved construction and operation.

Other objects and advantages will appear from the following description.

The invention is exemplified by the combination and arrangement of parts shown in the accompanying drawing and described by the following specification and it is more particularly pointed out in the appended claims.

In the drawing:

Fig. 1 is an elevation of a pair of insulator caps secured together face to face in the manner of the present invention.

Fig. 2 is a section on line 2—2 of Fig. 1.

Fig. 3 is a section on line 3—3 of Fig. 1 with the tool in place for rotating the bolt.

Figs. 4 and 5 are views similar to Fig. 3 showing different positions of the operating tool.

Figs. 6 and 7 are side and front elevations respectively of the operating tool forming part of the present invention.

For many installations it has been found advantageous to equip high potential insulators and particularly post insulators with end caps having recesses therein for receiving the heads of nuts or bolts the recesses being provided with retaining ledges having peripherally opening slots through which the bolts extend. These recesses are made of a size to fit easily about the head or nut of a bolt and prevent rotation thereof. Each recess is open at its outer face to receive the bolt head or nut. Heretofore slotted fittings of this kind could be secured only to plates or flanges having perforations for the attaching bolts and having sufficiently unobstructed space on the side opposite the cap to permit operation of a wrench to tighten or loosen the nut on the connecting bolt. Prior to the present invention it has been impossible to connect two such fittings face to face because if the head of the bolt were placed in a recess in one fitting and the nut in another neither of the two could be rotated to thread them together.

The present invention overcomes this difficulty by providing the bolts with specially castellated cylindrical heads and a special form of operating tool by means of which the head can be rotated any amount desired by the limited angular movement of the tool allowed by the open side of the recess in the cap.

Referring more specifically to the drawing the numerals 10 and 11 designate respectively two insulator caps placing one upon the other in the position they would occupy for connecting two insulators together in a stack. The two caps are duplicates and each is provided with a plurality of recesses 12 partially closed by flanges 13 providing slots 14 therebetween for bolts 15. Each bolt is provided with an integral cylindrical, castellated head 16, each head having four circumferentially spaced abutments 17. The opposite end of each bolt is threaded into a nut 18 which fits in the recess in the other cap. The abutments 17 are preferably made of hardened and drawn steel and have cylindrical inner faces as shown in Figs. 3, 4 and 5. In assemblying the parts the nuts are loosely threaded on the bolts and the bolts and nuts together are slipped into place as shown in Fig. 1. The nuts of course, are held from rotation by the walls of the recesses and are tightened by rotation of the bolts. This is accomplished by means of the tool 19 shown in Figs. 6 and 7. Preliminary tightening may be done by the beveled end 20 which can be used to engage the abutments 17, although the tool is made of hardened and drawn steel this beveled point can hardly be made strong enough to tighten the nuts as much as is desirable. The other end of the tool is therefore provided with an angularly disposed portion forming a head 21 for producing the final tightening. At the bend the tool is preferably slightly flattened as shown at 22 to spread the stock and increase resistance to bending in the plane of the angle. The inner edge of the flattened portion is rounded at 23 to fit the faces of the abutments 17 when the tool is in operating position as shown in Figs. 3, 4 and 5. The rounded surface provides a stop 24 to limit inward movement of the tool. A rounded notch 25 is formed in the inner face of the tool adjacent the end of the operating head 21, the radius of curvature also being the same as that of the faces of the abutments 17. The inner face 26 of the head is beveled off substantially on a plane tangent to the curves 23 and 25.

In operation the head 21 is inserted between the abutments 17 as shown in Fig. 5. It will be noted that in this position the handle of the tool clears the wall of the recess 12 when one of the abutments 17 is at the middle of the open side of the recess. In inserting the tool the notch 25 is first placed in engagement with the outermost abutment 17 in a manner similar to the position shown in broken lines in Fig. 3, which will provide clearance for the forward corner of the tool to pass the next adjacent abutment as the tool handle is swung to the right and the tool advanced to the full line position in Fig. 5. The tool is now moved to broken line position in Fig. 4, thus rotating the bolt and partially threading it into the nut. The tool is then swung about the axis of the head 21 to full line position in Fig. 4 and the handle moved further to the left into the full line position in Fig. 3 thus completing a quarter turn of the bolt. The tool may then be drawn outwardly and swung to the right as the inner end of the head clears the innermost abutment. When the notch 25 contacts the outermost abutment the tool may be rotated about the axis of this abutment to the broken line position in Fig. 3. By now moving the tool to the left it may be easily withdrawn and the operation repeated until the nut is tight. The nut may be loosened by an operation reverse to that just described. The arrangement makes it possible to use a tool of maximum size and strength for the limited space available. The tool as well as the bolt head is preferably made of tempered or specially treated steel to provide maximum strength for its size.

I claim:

1. The combination with superposed fittings having juxtapositioned recesses therein which are open at one side but closed at the sides adjacent to the open side, of a fastener head disposed in one of said recesses and rotatable therein, and a nut element on said fastener and held against rotation in the other of said recesses, said head having spaced abutment members thereon disposed about a central open space for receiving an operating tool inserted through the open side of said recess in different angular positions between different abutments and across said space for rotating said head in said recess.

2. The combination with superposed fitting having juxtapositioned recesses therein and receiving a bolt head in one of said recesses, retainer flanges overlying said recesses and providing an open ended slot to receive the bolt, said recesses being open at the side thereof adjacent the open end of said slot but closed at the sides adjacent the open side, of a bolt having a head of a size and shape to be rotated in one of said recesses when the bolt extends through said slot and a nut element in the other of said recesses and held against rotation therein, said bolt head having peripherally disposed circumferentially spaced abutment members projecting from the end face of said head and arranged about a central open space across which a tool may extend when inserted between spaced ones of said abutments through the open side of said recess to rotate said head in said recess.

3. A bolt having a substantially cylindrical head with abutments projecting from the end face of said head, said abutments being substantially semi-circular in section with respect to the plane of said head and disposed adjacent the periphery of said face and circumferentially spaced apart about an open center space to accommodate a tool extending across said center space and between different ones of said abutments in different angular positions about the axis of said bolt said tool contacting the rounded surfaces of said abutments.

4. A bolt having a substantially cylindrical head integral therewith, said head being castellated to provide abutments for an operating tool, the inner faces of said abutments being substantially semicircular to facilitate manipulation of an operating tool across the face of said head and between said abutments.

5. A pair of superposed fittings each having recesses therein adjacent one face thereof and having flanges overlying said recesses and provided with a bolt receiving slot therebetween, each of said recesses having an open side and each slot having an open end contiguous with said open side, said fittings being disposed face to face with said slots in registration and a bolt having a fixed head on one end and a nut threaded on the other end forming a head for said other end, said bolt being disposed in said slots with the heads on the opposite ends thereof disposed in said recesses respectively, one of said heads being rotatable in its recess while the other head is held against rotation in its recess, said rotatable head having a plurality of substantially semicircular abutments thereon which form a plurality of slots adapted to receive a bent tool, said tool adapted for rotation in said head slots to increase the degree of bolt rotation for each slot position of said tool.

6. A pair of fittings each having a recess therein adjacent one face thereof and having flanges overlying said recess and provided with a bolt receiving slot therebetween, each recess having an open side and each slot having an open end contiguous with said open side, said fittings being disposed face to face with said slots in registration and a bolt extending through said slots and having a head fixed on one end thereof disposed in one of said recesses and rotatable therein and having a nut threaded on the other end thereof and disposed in the other recess and held from rotation therein, the fixed head of said bolt having circumferentially spaced abutment members thereon disposed about a central open space for receiving an operating tool inserted through the open side of said recess for rotating said head and bolt to tighten or loosen the nut thereon.

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