

[54] **METHOD FOR REPLACING EXISTING UTILITY POLE WITHOUT DISTURBING HARDWARE MOUNTED THEREON**

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[22] Filed: **Oct. 2, 1974**

[21] Appl. No.: **511,173**

[52] **U.S. Cl.** **29/401; 29/427; 52/40; 174/45 R**

[51] **Int. Cl.²** **B23P 7/00**

[58] **Field of Search** **29/401, 426, 427; 174/45 R; 52/40, 721; 248/58, 59**

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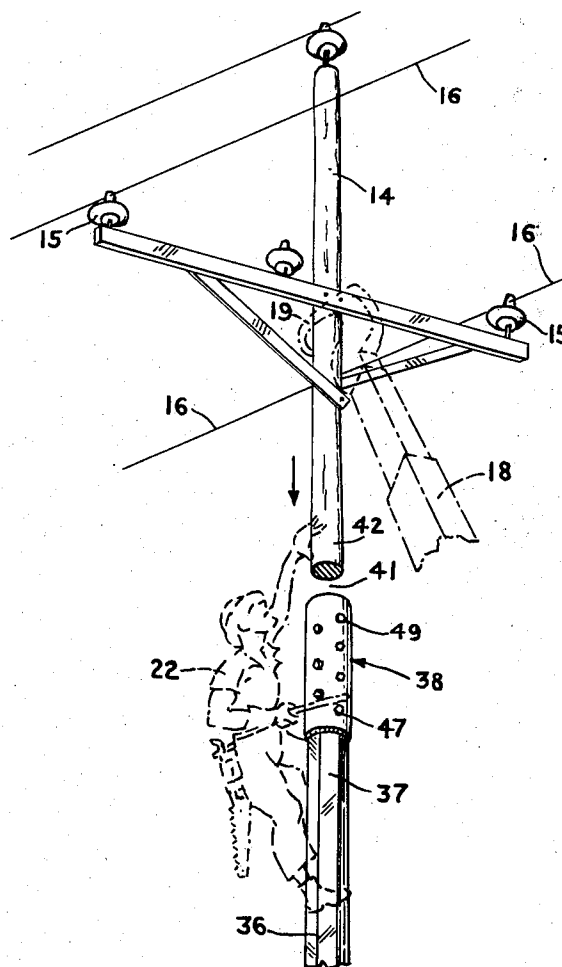
Attorney, Agent, or Firm—Charles E. Baxley

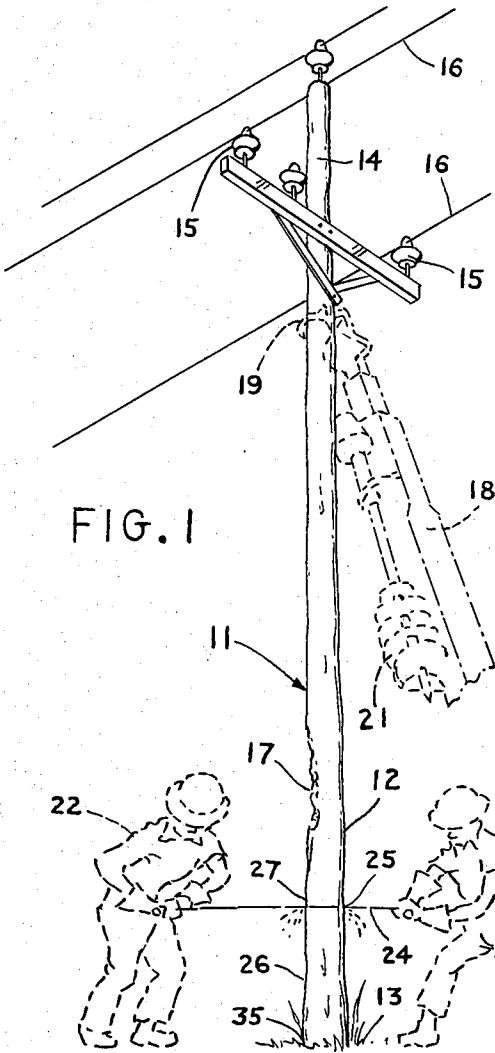
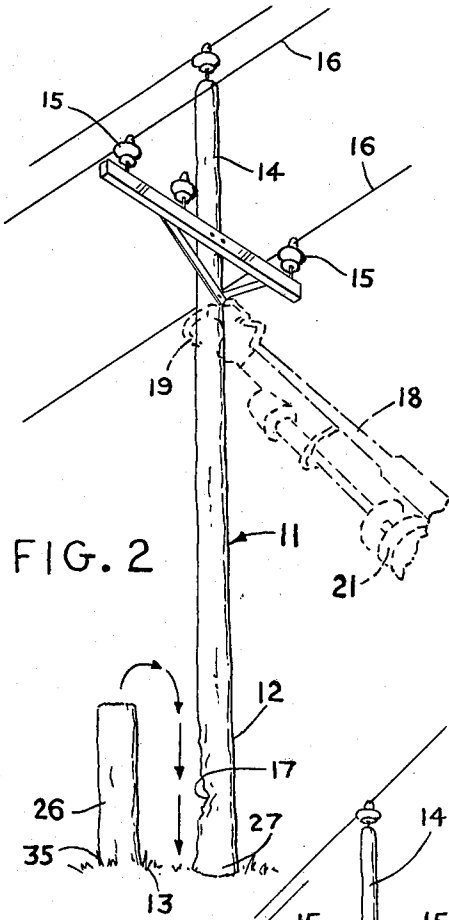
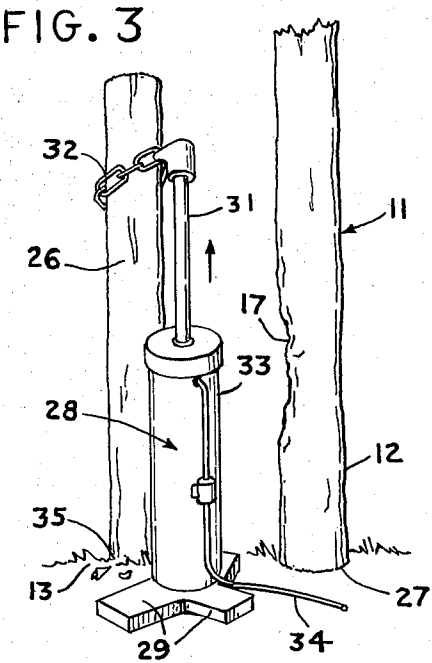
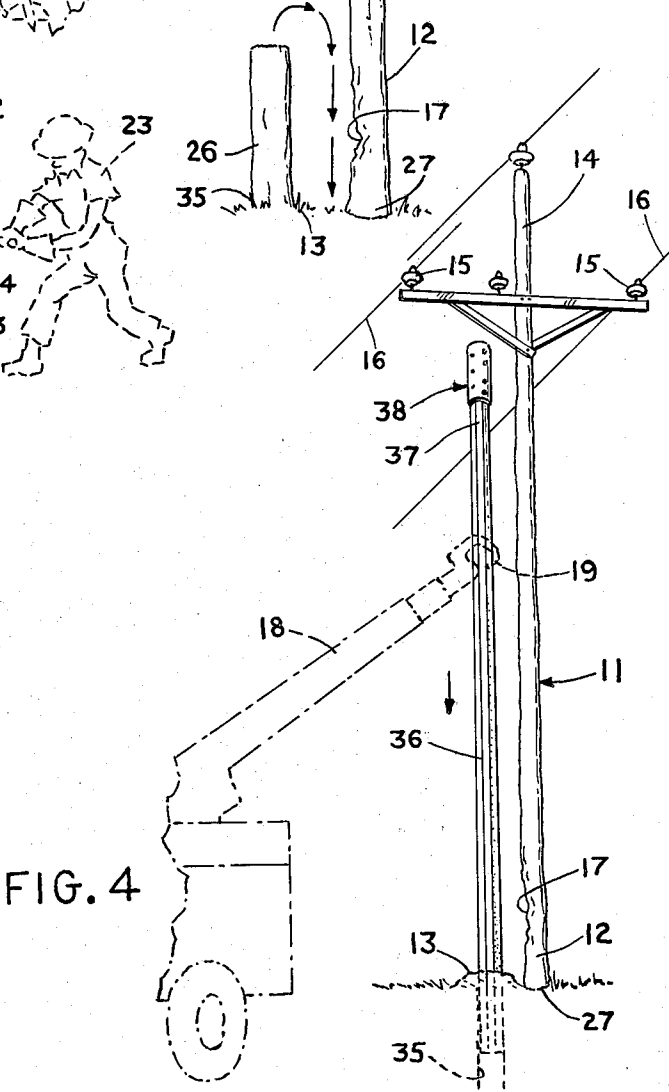
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ABSTRACT

A method for replacing an existing utility pole comprising a proximal section having a bottom end attached to the earth and a distal section having hardware mounted thereon. A principal object is to replace the existing utility pole without disturbing the hardware. A new pole section is attached to the earth. The distal section with the hardware intact thereon is severed from the proximal section. The distal section is then connected to project from the new pole section. The new pole section can have a length different from the proximal section, so that net distance of the hardware from the earth is changed. Preferably the new pole section is made of prestressed concrete and is hollow to accommodate a line therein between the distal section and the earth to provide positive grounding to the earth.

25 Claims, 10 Drawing Figures





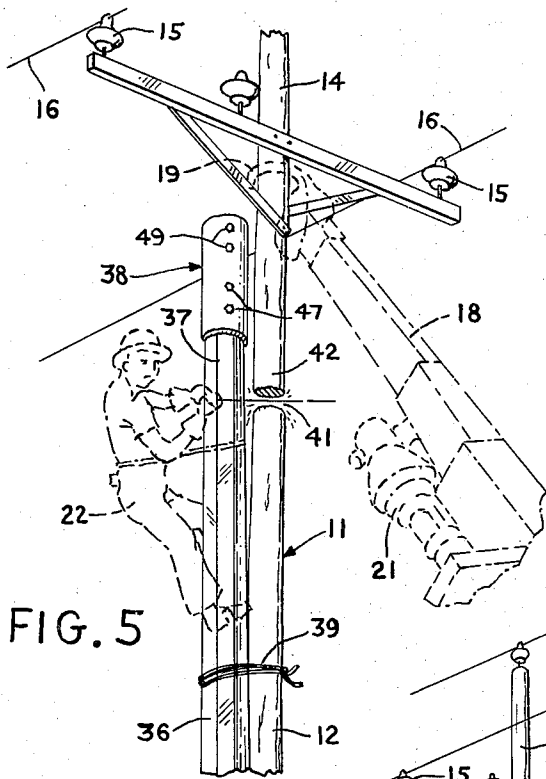


FIG. 5

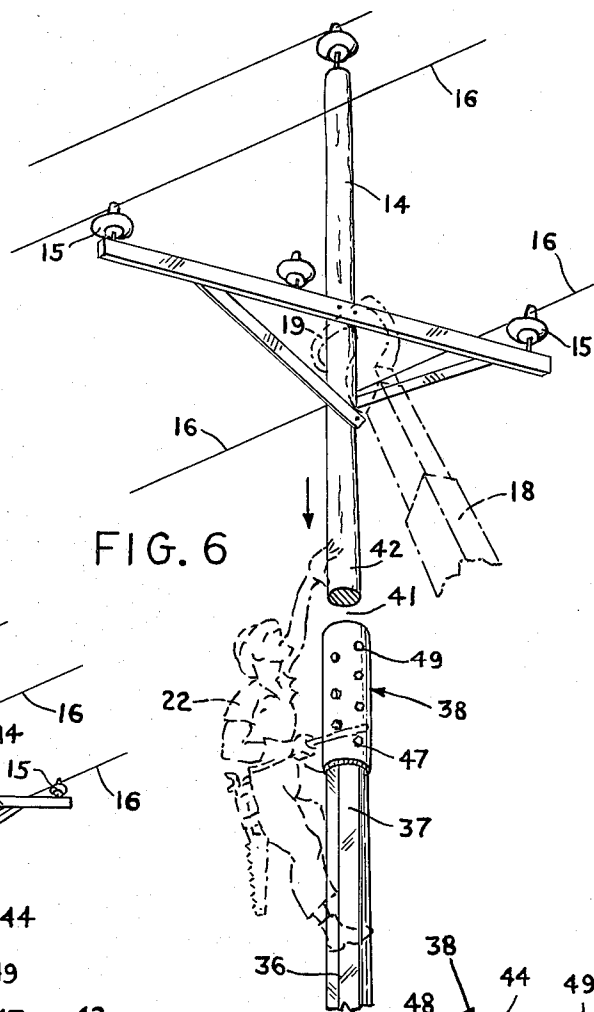


FIG. 6

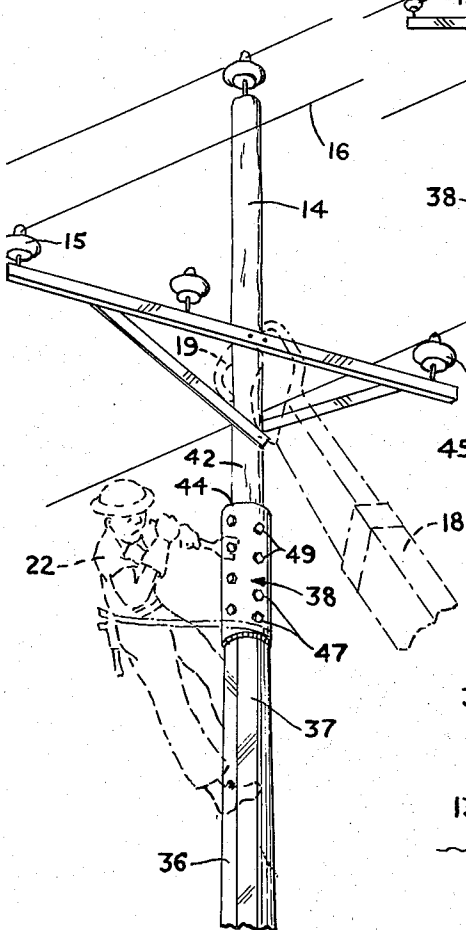


FIG. 7

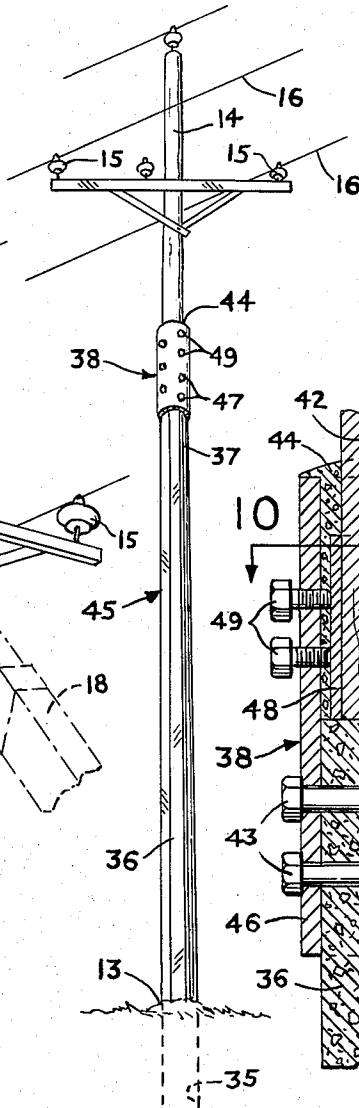


FIG. 8

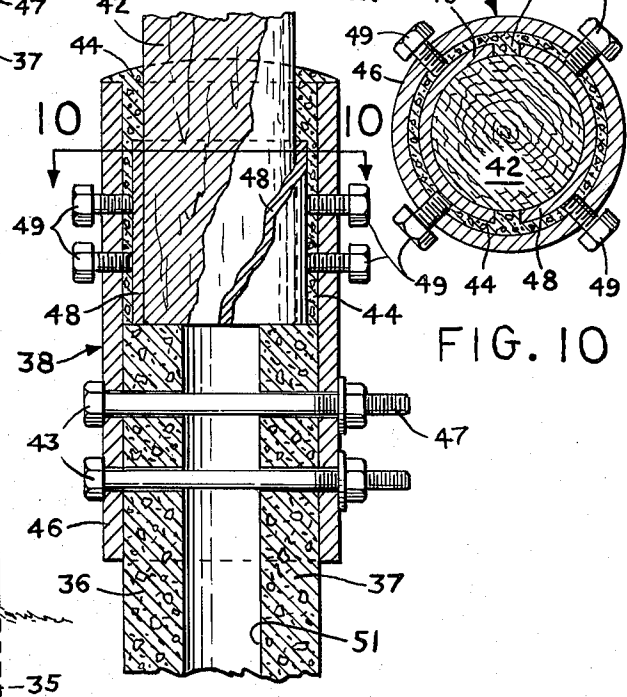
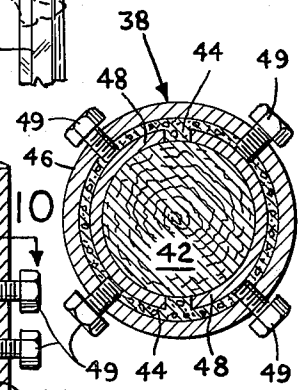


FIG. 9

FIG. 10



METHOD FOR REPLACING EXISTING UTILITY POLE WITHOUT DISTURBING HARDWARE MOUNTED THEREON

BACKGROUND OF INVENTION

Utility poles are subject to damage and deterioration, so it is desirable to provide for convenient replacement thereof.

Hardware connections to distal ends of utility poles represent expensive equipment and highly skilled workmanship performed sometimes under hazardous conditions. Accordingly it is desirable to replace utility poles in such a way as to avoid necessity for reworking such hardware as well as interruptions of service resulting therefrom. Convenient and inexpensive means also have been desirable to alter the elevation and/or alignment of such hardware relative the earth.

Availability of materials for utility poles and economics relating thereto frequently dictate that a new pole be of a different material from that of the existing utility pole which is being replaced.

BRIEF STATEMENT OF INVENTION

The present invention solves the stated problems and other problems of the prior art in a useful, novel, unobvious and particularly facile way. A method is presented for replacing an existing utility pole which pole comprises a proximal section having a bottom end attached to the earth and a distal section having hardware thereon, without disturbing the hardware. A new pole section is attached to the earth. The distal section of the existing pole, with the hardware intact thereon, is severed from the proximal section of the existing pole. The distal section is then connected to project from the new pole section.

The new pole section may have a length substantially the same as the proximal section of the existing utility pole, whereby the hardware will be restored to approximately its original elevation above the earth, or the new pole section may have a different length from that of the proximal pole section, whereby the elevation of the hardware may be changed.

The proximal section may first be severed from the earth so as to leave a stump section protruding from the earth and so as to define a bottom end of the proximal section. Then the proximal section may be arranged vertically adjacent the stump section with the bottom end of the proximal section on the earth for supporting temporarily the distal section. During the severing of the distal section from the proximal section and the connecting of the distal section to the new pole section, the distal section is supported independently for example by means of a crane.

The new pole section can be of any otherwise suitable pole material as can be the existing pole. Preferably the new pole section is of prestressed concrete and formed hollow so that (inter alia) a connecting line between the distal section and the earth may be provided therewithin to provide positive grounding to the earth. Hydraulic jacking is a convenient way of removing the stump section and the hole vacated thereby (with or without augering) is useful for implanting the new pole section therein.

Alternately the new pole section can be erected adjacent the old pole and, after severing the distal section (with the hardware thereon) from the proximal section of the old pole, the distal section (with the hardware

thereon) can be mounted on the new pole section. Thereafter the proximal section of the old pole can be removed.

Accordingly one object of this invention is to allow convenient, inexpensive, rapid and safe replacement of damaged or deteriorated utility poles.

Another object of this invention is to allow replacement of utility poles without having to rework hardware thereon and without interruption of service.

Still another object of this invention is to provide for convenient altering of the height and/or alignment of hardware on utility poles.

Still another object of this invention is to accommodate use of a same or an otherwise suitable different material for new pole sections relative the material of the existing pole.

Still another object of this invention is to allow for the proximal section first being severed from the earth so as to leave a stump section protruding from the earth and so as to define a bottom end of the proximal section. Then the proximal section may be arranged vertically adjacent the stump section with the bottom end of the proximal section on the earth for supporting temporarily the distal section.

Still another object of this invention is preferably to use new pole sections of prestressed concrete which are hollow and which can accommodate therewithin a connecting line between the distal section and the earth to provide positive grounding to the earth.

Still another object of this invention is to allow hydraulic jacking to remove the stump section, thereby providing a vacated hole (with or without augering) for implanting the new pole section therein.

BRIEF DESCRIPTION OF DRAWINGS

The foregoing and other objects, features and advantages will appear more fully from accompanying drawings, viewed in conjunction with a detailed description of a preferred embodiment of the invention and with claims which follow. In the drawings the same numerals refer to like elements throughout and

FIG. 1 is a schematic illustration of a damaged utility pole held by means of a crane and being severed from the earth by workmen.

FIG. 2 is a schematic illustration of the damaged pole with a bottom end on the earth in vertical alignment with a stump section.

FIG. 3 is a schematic illustration of the stump section being removed by means of a hydraulic jack.

FIG. 4 is a schematic illustration of inserting a new pole section in the hole vacated by the stump section.

FIG. 5 is a schematic illustration of lashing the damaged utility pole to the new pole section, severing a distal section with hardware intact thereon and supporting the distal section by means of the crane.

FIG. 6 is a schematic illustration of insertion of the distal section of the damaged pole with the hardware intact thereon into a socket atop the new pole section.

FIG. 7 is a schematic illustration of connection of the distal section to the new pole section.

FIG. 8 is a schematic illustration of the completed operation with the new pole section having mounted thereon the distal section of the old pole with the hardware intact thereon.

FIG. 9 is a sectional elevation view of a joint suitable for connecting the new pole section to the distal section of the old pole.

FIG. 10 is a cross sectional view of a suitable joint taken along the line 10—10 of FIG. 9.

DESCRIPTION OF PREFERRED EMBODIMENT

As seen in the drawings, and more particularly by viewing FIGS. 1—8 in sequential order, a method is illustrated for replacing a damaged or deteriorated utility pole (generally designated 11) and having a proximal section 12 attached to the earth 13 and a distal section 14 having hardware 15 thereon and on which utility wires 16 are strung. Replacement of the pole 11 does not require disturbing of the hardware 15 and it can be accomplished readily without any interruption of service.

The sequence of operations begins in FIG. 1 wherein a damaged area of the utility pole 11 is shown at 17. A crane boom 18 (usually mounted on a maintenance truck, a cherry picker crane or the like) is connected to the pole 11 by means of a sling 19. The shown boom 18 of a maintenance truck is also equipped with an auger 21. Men 22 and 23 are shown with a hand saw 24 for severing the pole 11 at 25 to leave a stump section 26 and a bottom end 27 of the proximal section 12.

The bottom end 27 of the proximal section 12 is placed by means of the boom 18 on the earth 13 upright next to the stump section 26 as shown in FIG. 2. The stump section 26 is of sufficient height to allow the workmen 22, 23 a convenient level 25 at which to work in sawing the pole 11. However, it is desirable that the stump section 26 not be so tall that the utility wires 16 cannot accommodate temporary change in elevation of the hardware 15. If the pole is made of a material other than wood; such as prestressed concrete, steel, aluminum or the like; some other suitable means can be employed for severing the proximal section 12 from the earth 13.

The next operation as shown in FIG. 3 is to remove the stump section 16 from the earth 13. Toward this objective a hydraulic jack generally designated 28 is convenient. The jack 28 is mounted on suitable supports 29 adjacent the stump section 26 and a ram 31 is fastened to the stump section 26 by means of a taut chain 32. With the stump section 26 fastened thusly to the ram 31, a hydraulic piston (not shown) in a cylinder 33 is pressurized via a line 34 so as to extract the stump section 26 from the earth 13 leaving a hole 35. Of course other tools may be employed for extracting the stump section 26 depending on convenience, availability, safety and other factors. When the stump section 26 is extracted, the hole 35 resulting therefrom affords a convenient and logical receptacle for a new pole section 36. The hole 35 may need augering and if so this usually can be attended to by the auger 21 with which maintenance trucks are conveniently provided. Alternately the new pole section may be inserted in a new hole.

The new pole section 36 is shown in FIG. 4 inserted in the hole 35 from which the stump section 26 was extracted. The new pole section 36 is provided at its upper end 37 with a socket connector generally designated 38. It is then convenient to lash the proximal section 12 of the old pole 11 to the new pole section 36 by means of a rope 39 shown in FIG. 5. With the boom 18 connected to the distal section 14 of the old pole 11 and with the proximal section 12 of the old pole 11 attached to the new pole section 36 as has been mentioned, a workman 22 severs the distal section 14 of the

old pole 11 from the proximal section 12 at 41, all as shown in FIG. 5. Then as shown in FIG. 6 the boom 18 lowers a lower end 42 of the distal section 14 of the old pole 11 into the socket connector 38 on the upper end 37 of the new pole section 36. The workman 22 guides the distal section 14 of the old pole 11 into the socket connector 38 on the upper end 37 of the new pole section 36 as shown in FIG. 7. Guy lines attached to the distal section 14 may be used for plumbing from the ground. The workman 22 completes the connecting by tightening bolts 49 and filling the joint with a sealant 44. The workman 22 uses conventional means for supporting himself at the distal section 14. Accordingly a resulting composite new pole generally designated 45 results as shown in FIG. 8 which is composed of the new pole section 36 from which is connected the distal section 14 of the old pole 11 with its hardware 15 still intact thereon and still connected to its utility wires 16.

A wide variety of connectors 38 may be used for mounting the distal section 14 of the old pole 11 onto the new pole section 36. These connectors may also provide for the distal section 14 to be replaced at a later date. Where the new pole section 36 is made of steel, aluminum, prestressed concrete or fiber reinforced resin; the socket connector 38 is conveniently shop formed integrally on the upper end 37 of the new pole section 36. These new pole sections may also be other than round in cross section. The shown socket connector 38 includes a sleeve 46 mounted on the upper end 37 of the new pole section 36 by means of bolts 43 and nuts 47. Centering sleeves 48 are provided as shown in FIGS. 9 and 10 and lower end 42 of the distal section 14 is secured in place by some of the bolts 49. Thereafter the joint is filled with a suitable sealant 44 such as grout, polyurethane foam or the like. Hollow space 51 can accommodate an electrical connection between the distal section 14 and the earth 13.

It will be apparent to those skilled in manufacture and erection of utility poles that wide deviations may be made from the shown embodiment without departing from a main theme of invention delineated in claims which follow.

I claim:

1. A method for replacing an existing utility pole comprising a proximal section having a bottom end attached to the earth and a distal section having hardware thereon, without disturbing the hardware; the method comprising steps of:

Attaching a new pole section to the earth appropriately located and adapted for receiving the distal section.

severing the distal section from the proximal section, temporarily supporting the severed distal section, and then

connecting the distal section to project from the new pole section.

2. The method of claim 1 and the new pole section having a length substantially the same as the proximal section.

3. The method of claim 2 and the existing pole made of wood and the new pole section made of prestressed concrete.

4. The method of claim 3 and the new pole section hollow.

5. The method of claim 2 and removing the proximal section after connecting the distal section to project from the new pole section.

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6. The method of claim 5 and the existing pole made of wood and the new pole section made of prestressed concrete.

7. The method of claim 6 and the new pole section hollow.

8. The method of claim 2 and severing the proximal section from the earth so as to leave a stump section protruding from the earth and so as to define a bottom end of the proximal section,

arranging the proximal section vertically adjacent the stump section with the bottom end of the proximal section on the earth for supporting temporarily the distal section,

supporting independently the distal section during said severing of the distal section and said connecting of the distal section to the new pole section.

9. The method of claim 8 and the existing pole made of wood and the new pole section made of prestressed concrete.

10. The method of claim 9 and the new pole section hollow.

11. The method of claim 8 and jacking the stump section from the earth hydraulically whereby a hole is formed.

12. The method of claim 11 and said attaching of the new pole to the earth being accomplished via the hole.

13. The method of claim 1 and the new pole section having a length different from the proximal section so that the net distance of the hardware from the earth thereby is changed.

14. The method of claim 13 and the existing pole made of wood and the new pole section made of prestressed concrete.

15. The method of claim 14 and the new pole section hollow.

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16. The method of claim 13 and removing the proximal section after connecting the distal section to project from the new pole section.

17. The method of claim 16 and the existing pole made of wood and the new pole section made of prestressed concrete.

18. The method of claim 17 and the new pole section hollow.

19. The method of claim 13 and

severing the proximal section from the earth so as to leave a stump section protruding from the earth and so as to define a bottom end of the proximal section,

arranging the proximal section vertically adjacent the stump section with the bottom end of the proximal section on the earth for supporting temporarily the distal section,

supporting independently the distal section during said severing of the distal section and said connecting of the distal section to the new pole section.

20. The method of claim 4 and the existing pole made of wood and the new pole section made of prestressed concrete.

21. The method of claim 20 and the new pole section hollow.

22. The method of claim 4 and jacking the stump section from the earth hydraulically whereby a hole is formed.

23. The method of claim 22 and said attaching of the new pole to the earth being accomplished via the hole.

24. The method of claim 1 and the existing pole made of wood and the new pole section made of prestressed concrete.

25. The method of claim 24 and the new pole section hollow.

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