

[54] POLE REINFORCING APPARATUS

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[22] Filed: **Apr. 7, 1972**

[21] Appl. No.: **242,031**

[52] U.S. Cl. .... **52/170, 52/514, 52/728**

[51] Int. Cl. ... **E02d 37/00, E04g 23/02, E04h 12/04**

[58] Field of Search ..... **52/170, 165, 297, 52/296, 292, 726, 728, 514**

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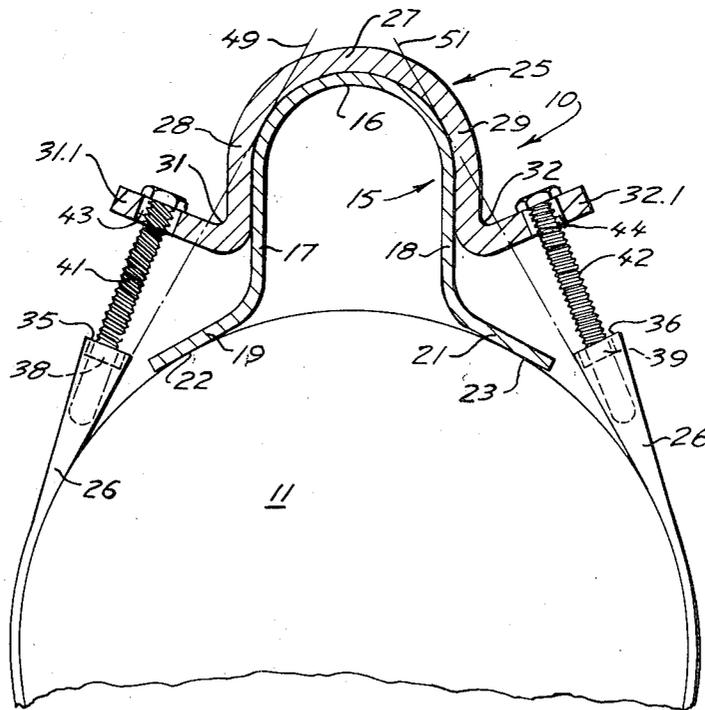
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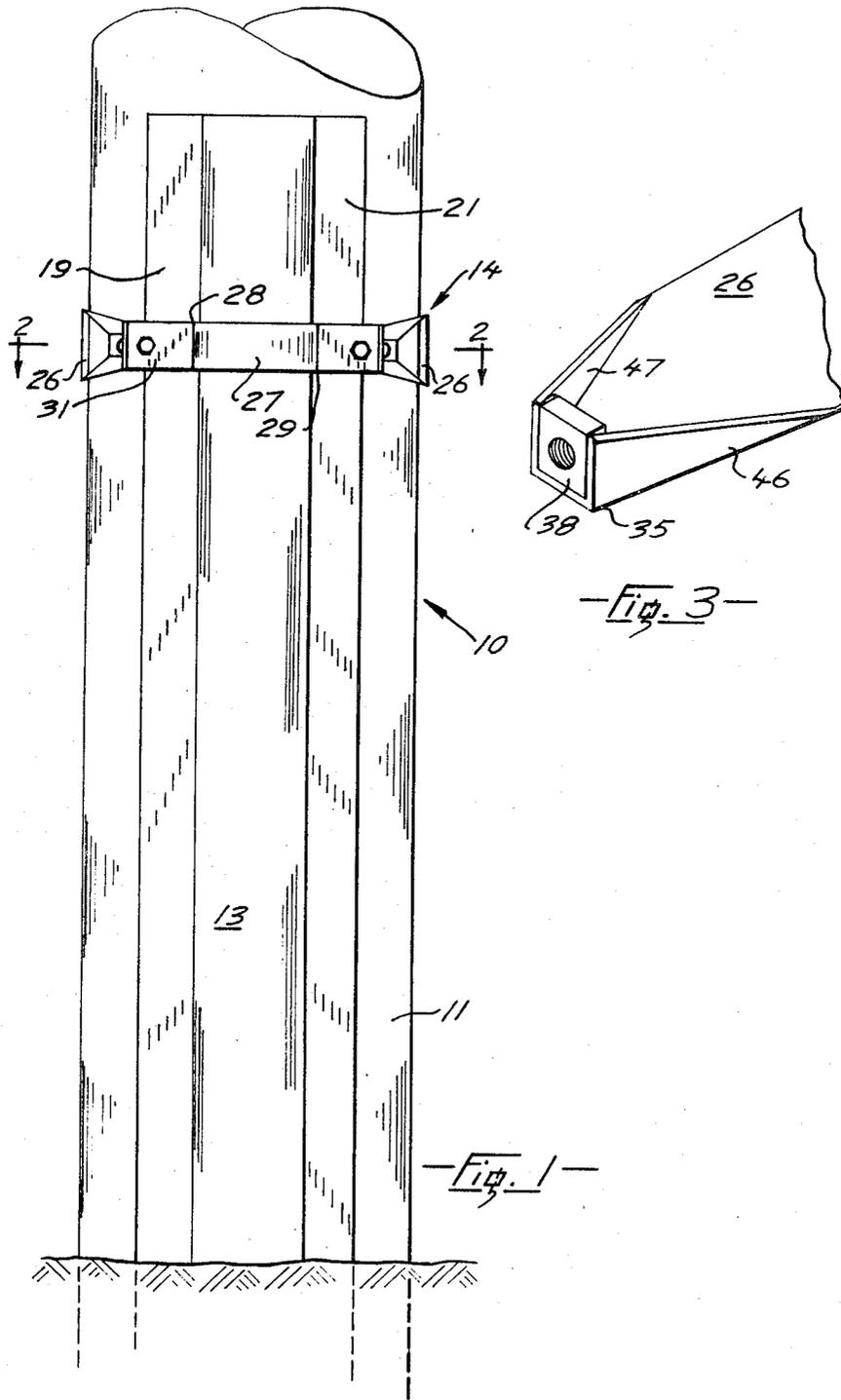
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[57] **ABSTRACT**

Pole reinforcement apparatus for reinforcing a wooden utility pole which includes a stub adapted to be driven into the ground along side the pole the stub having a body portion of substantially U-shaped cross section having side legs from which lateral flanges extend for tangential engagement with the pole. A flexible tension member extended around the pole is connected to flanges extending laterally from legs of a U-shaped cap which fits over the stub body for binding the stub to the pole.

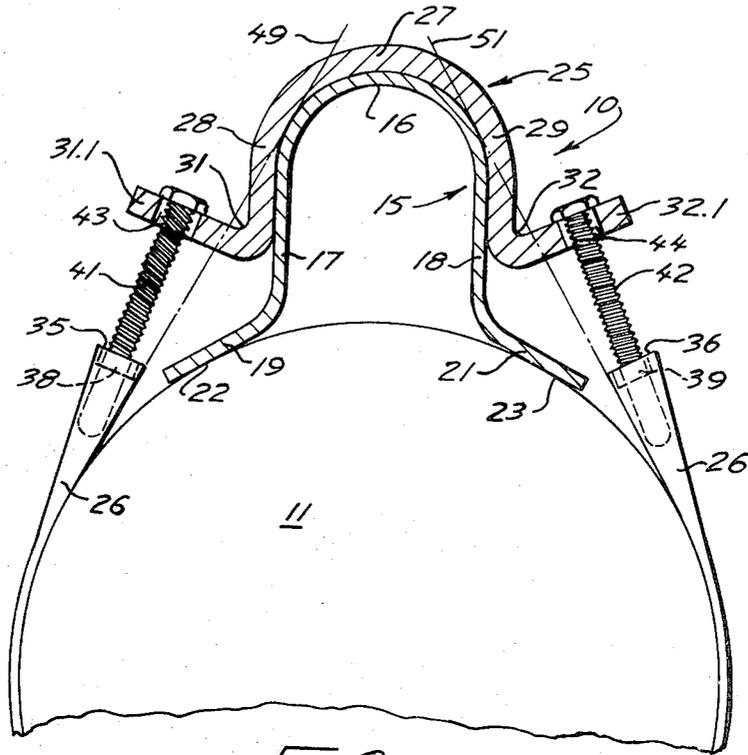
**4 Claims, 4 Drawing Figures**



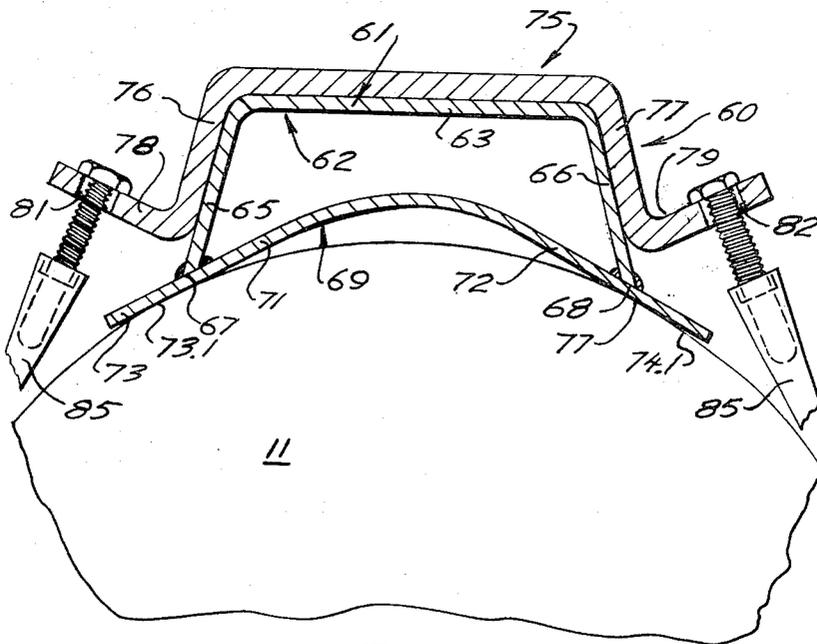


-Fig. 1-

-Fig. 3-



-Fig. 2-



-Fig. 4-

## POLE REINFORCING APPARATUS

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

This invention relates to apparatus for reinforcing wooden utility poles.

#### 2. Prior Art

The use of reinforcing stubs to reinforce wooden utility poles which have been weakened due to decay, usually at ground level, is well known. The stubs, which commonly are wood or metal, are driven into the ground along side the pole to be reinforced and bound to the pole by tensioning devices.

Wooden stubs are generally unsightly and, furthermore, are difficult to drive under certain ground conditions. Metal stubs of prior art are usually easier to drive than wooden stubs however prior art metal stubs either offer biting edges to the pole to be reinforced or offer a curved surface corresponding to pole curvature.

Metal stubs which bite into the pole tend to loosen under cyclic loading whereas those offering a curved surface to the pole result in entrapment of water and, consequently, early above ground decay.

### SUMMARY OF THE INVENTION

The present invention provides a utility pole reinforcement apparatus having a metal stub which is easy to drive, and which offers tangential contact with the pole so as to avoid entrapment of water. The present invention also includes a tensioning device for binding the pole and stub, which when tightened, effectively strengthens the stub.

The apparatus of the present invention includes a stub having a substantially U-shaped body portion having spaced side legs terminating in laterally extending flanges adapted for tangential engagement with the pole, a U-shaped cap having a snug fit over the body portion of the stub and having laterally extending flanges, a flexible tension member for embracing the pole and connecting means for connecting the tension member to the cap flanges are pressed inwards against the side legs of the stub so as to counteract spreading.

A detailed description following related to drawings, gives exemplification of preferred embodiment of the invention which, however, is capable of expression in a structure other than that particularly described and illustrated.

### DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevation of one embodiment of pole reinforcement apparatus of the invention secured to a utility pole,

FIG. 2 is an enlarged section on 2—2 of FIG. 1,

FIG. 3 on sheet one of the drawings, is an enlarged perspective view of a portion of a tensioning device,

FIG. 4 is a section similar to that of FIG. 2 showing another embodiment of pole reinforcement apparatus in accordance with the invention.

### DETAILED DESCRIPTION

FIG. 1 shows one embodiment of pole reinforcement apparatus, generally 10, secured to a wooden utility pole 11.

The pole reinforcement apparatus 10 includes a stub 13 which is driven into the ground along side the pole and which is bound tightly to the pole by a tensioning device 14.

The stub 13 is formed of a length of thick sheet metal, e.g. steel or iron, and has a U-shaped body portion 15, see FIG. 2, having a convexly curved base 16 and spaced parallel side legs 17 and 18 which terminate in laterally and outwardly extending side flanges 19 and 21. The flanges are at an obtuse angle, approximately 120°, to the legs and have flat, pole engaging faces 22 and 23.

The tension device 14, see FIG. 2, includes a metal cap 25 which fits over the body portion 15 of the stub and a tension member 26 which is extended around pole to be reinforced and secured to the cap 25 for binding the stub to the pole.

The cap 25 is U-shaped having a curved base 27 and side legs 28 and 29, which terminate in laterally and outwardly extending flanges 31 and 32. The cap flanges extend at an acute angle, about seventy degrees, to the cap legs. The cap legs are about one half the length of the stub side legs so that, with the cap fitted on the stub, the cap flanges are spaced from the stub flanges.

The tension member 26 is a thin steel strap at ends 35 and 36 of which nuts 38 and 39 are secured for receiving threaded shanks of bolts 41 and 42 which pass through holes 43 and 44 in the cap flanges 31 and 32.

Referring to FIG. 3 which illustrates connection of the nut 38 to the end 35 of the strap it is seen that the strap end 35 is bent to provide a pair of triangular side pieces 46 and 47 which converge to form a socket within which the nut 38 is welded. The nut 39 is secured in a like manner to the end 36 of the strap.

The apparatus 10 is usually used to reinforce smaller utility poles, e.g. having a butt diameter of fourteen inches or less.

Dimensional relationship of apparatus 10 to the pole to be reinforced is such that the stub flanges 19 and 20 engage the pole tangentially of as to obtain substantially line contact. Length of the cap flanges 31 and 32 is such that the flanges have portions 31.1 and 32.1, in which the holes 43 and 44 are located, extending outwards beyond planes, represented by broken lines 49 and 51, which have common tangency with both the cap and the pole. Thus tightening of the bolts to tension the tension member results in inward pressure of the cap legs and flanges against the stub legs. Tendency of the stub legs to spread apart under load is thus counteracted so as to minimize tendency of the stub to loosen under cyclic loading.

It is seen that although the stub 16 has a relatively small total cross sectional area, which enables it easily to be driven into the ground, good anchorage against lateral movement is obtained due to the extending flanges and relatively bulky body portion.

Further, as the stub flanges 19 and 21 offer line contact with the pole, entrapment of water between the stub and the pole is, effectively, avoided.

FIG. 4 illustrates another embodiment of pole reinforcement apparatus 60.

Apparatus 60 includes a stub 61 having a substantially U-shaped body portion 62, which has a flat base 63 and outwardly sloped side legs 65 and 66. Outer side edges 67 and 68 of the legs are welded to a reinforcing plate 69 which extends the full length of the stub and which is bent inwards along a longitudinal center line to clear the pole 70 and provide a pair of curved flanges 71 and 72 having marginal portions 73 and 74 which extend laterally outwards of the legs 65 and 66 and which have flat planar pole engaging faces 73.1 and

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74.1 which offer tangential line contact with the pole.

The apparatus 60 also includes a cap 75, similar to the cap 25, shaped to fit the body of the stub and which has legs 76 and 77 terminating in laterally extending flanges 78 and 79 having holes 81 and 82 which are positioned as described with reference to corresponding holes of the apparatus 10. A tension member 85 similar to the tension member 26 of apparatus 10 and connected to the cap flanges 77 and 78 bind the stub 61 to the pole.

The pole reinforcing apparatus 60 is most suitable for large diameter poles where relatively high tension stresses of the tensioning member is necessary to effect support. Tendency of the stub legs to spread is counteracted by inward pressure of the cap legs as described with reference to apparatus 10 and by the reinforcing plate 69.

I claim:

1. A utility pole reinforcement apparatus including:

a. a stub adapted to be driven into the ground along side a pole to be reinforced, the stub having:

i. a substantially U-shaped body portion having a base and spaced side legs,

ii. a flange extending laterally outwards from each of the legs for tangential engagement with the pole,

b. a tension device for binding the stub to the pole,

the tension device including:

i. a substantially U-shaped cap adapted to fit over the stub body portion, the cap having a base and side legs,

ii. flanges extending laterally from ends of the cap side legs and spaced from the stub flanges, the cap flanges having end portions extending outwards of planes having common tangency with the stub body portion and the pole,

iii. a flexible tension member adapted to be extended around the pole,

iv. adaptable means connecting the tension member and the end portions of said cap flanges.

2. Utility pole reinforcement apparatus as described in claim 1 in which the connecting means includes nuts secured to ends of the tension member and bolts adapted to extend through holes in each of said end portions of the cap flanges engageable with the nuts.

3. Apparatus as claimed in claim 1 including a reinforcing plate extending between flanged ends of the stub legs, the plate being bent transversely of its length so as to provide clearance with the pole.

4. Apparatus as claimed in claim 3 in which the stub flanges are marginal side edge portions of the reinforcing plate.

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