Sept. 10, 1968 H. A. VAN DUSEN, JR 3,400,905

SUPPORT POLE ASSEMBLY FOR ELECTRICAL APPARATUS

Filed Oct. 5, 1966 2 Sheets-Sheet 1

Fig. 1

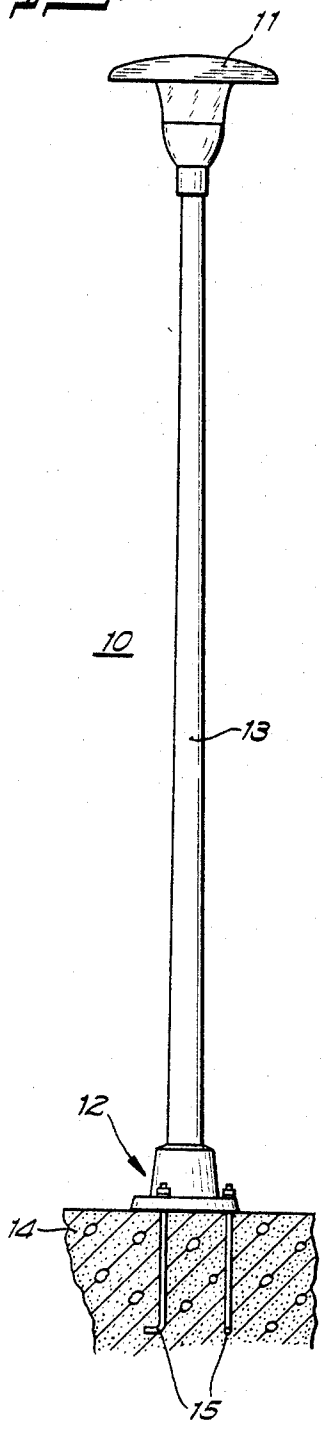
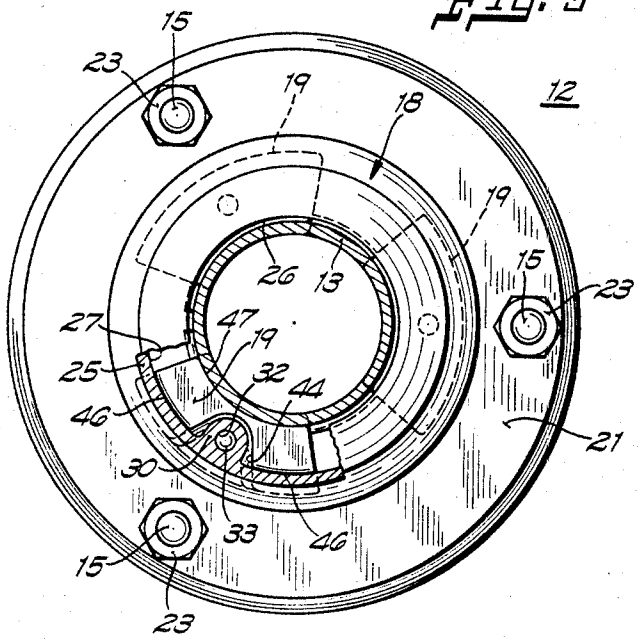


Fig. 3



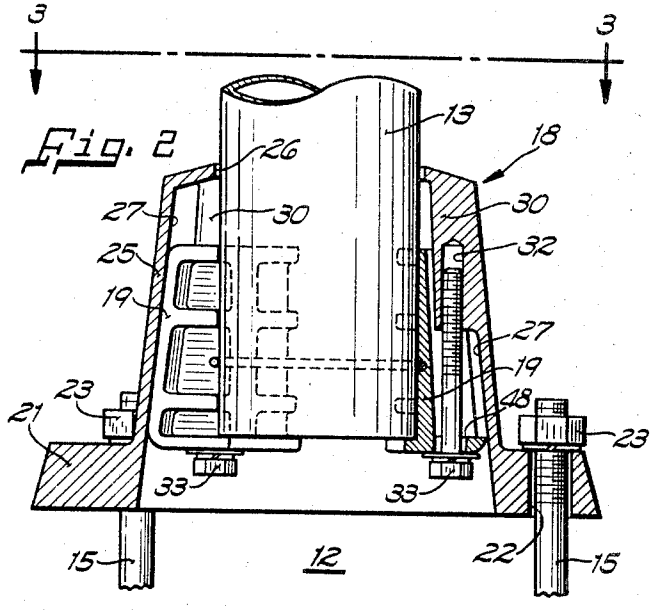


Fig. 2

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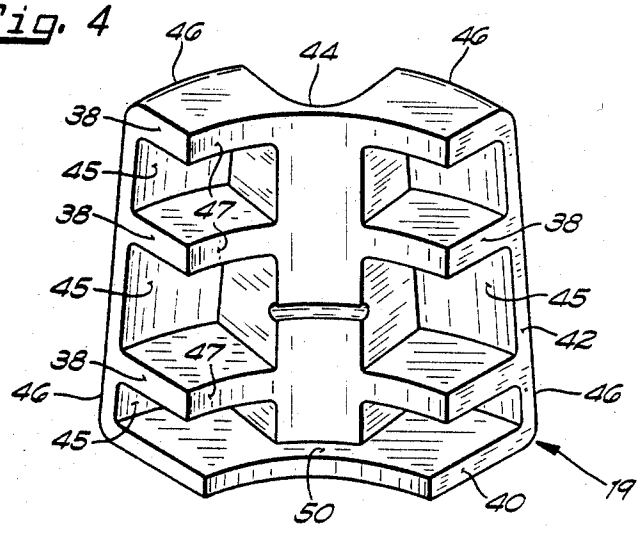
2 Sheets-Sheet 2

Fig. 4



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ABSTRACT OF THE DISCLOSURE

A pole supporting assembly for attaching a pole to a base structure including a base member with an interior frustoconical surface into which the lower end of the pole is inserted. The assembly further includes a plurality of wedge-like collets which are forcefully inserted between the interior surface of the base member and the lower exterior surface of the pole. The assembly further includes rim means, or inwardly projecting means, for supportingly engaging the lower end of the pole.

In general terms, the invention comprises an assembly for supporting electrical apparatus, including an elongate pole shaft, an anchor base having internal surface means displaced from and disposed in surrounding relation to one end of the pole shaft, and being at least partially inclined relative to the pole axis, and a plurality of collet members disposed between the surface means and the pole, each of the collet members having an inclined outer face portion complementary with the inclined surface for being moved into high pressure engagement therewith and also including an inner pole gripping means for being moved into high pressure resilient engagement with the pole. The assembly further comprises rim means or inwardly extending means for supportingly engaging the lower end of the pole.

It is the general practice in the installation of poles for roadway luminaires to weld the pole shaft to an anchor base. This required the stocking of various sized anchor bases for different pole sizes and lengths. In addition welding required that the pole be assembled to the base before transportation to the field which generally increased shipping costs, introduced relatively long delays and in addition prevented field repair.

It is an object of the invention to provide a pole assembly for supporting roadway luminaires wherein a single anchor base may accommodate various pole shaft sizes and gauges.

Another object of the invention is to provide a luminaire support pole assembly wherein the pole shaft is not welded to the anchor base.

Another object of the invention is to provide a luminaire wherein the pole shaft may be field assembled to the anchor base and damaged components may be field repaired.

A further object of the invention is to provide an assembly for mechanically coupling a pole to an anchor base wherein the pole and base are prestressed to minimize deflection in said pole as the result of loading at its upper end.

These and other objects and advantages of the instant invention will become more apparent from the detailed description thereof taken with the accompanying drawings in which:

FIG. 1 is a side elevational view of a luminaire support pole incorporating the instant invention;

FIG. 2 is a fragmentary view of the pole illustrated in FIG. 1 which shows the anchor base and pole shaft coupling;

FIG. 3 is a view taken along lines 3—3 of FIG. 2; and

FIG. 4 shows one of the collet members of the assembly.

Referring now to the drawings in greater detail FIG. 1 shows a vertical support pole assembly **10** which supports a roadway luminaire **11** in its upper end and includes an anchor base assembly **12** and a pole shaft **13**. The anchor base **12** may be affixed to a concrete pad **14** by elongate anchor bolts **15**.

The anchor base **12** is shown in FIGS. 2 and 3 to include a metallic base member **18** and a plurality of collet members **19** which are releasably securable to the base member **18** and which embrace the lower end of the pole shaft **13**.

The base member **18** includes an outer annular flange **21** having a plurality of spaced holes **22** for receiving the upper ends of the anchor bolts **15** which are secured by nuts **23**. The base also includes an annular, generally frusto-conical shell portion **25** integral with the flange **21** and extending upwardly therefrom. The upper end of the shell portion **25** is provided with a central aperture **26** for receiving the pole shaft **13**. The internal surface **27** of the shell portion **25** provides a generally conical bearing surface for the collet members **19**.

In addition a plurality of spaced, downwardly facing bosses **30** are formed on the surface **27** and each has a threaded hole **32** formed through its lower surface for receiving one of a plurality of bolts **33** each of which secures one of the collet members **19** to the base member **18**.

The collet members **19** are shown in FIGS. 2–4 to include a plurality of rib portions **38** for embracing the pole **13**, a base portion **40** for supporting the pole **13** and a back face portion **42** for engaging the bearing surface **27** and for supporting the rib portions **38** and the base portion **40**.

The back face portion **42** of each of the collet members **19** extends the full height of the member and in section has a generally U-shaped central part **44** and a pair of arcuate side parts **45**. The rear surface **46** of each of the side parts **45** is a section of a conoid which is complementary to and disposed in the engagement with the bearing surface **27**. The rib portions **38** are integral with and extend in generally parallel planes transverse to the back portions **42**. In addition each rib portion **38** comprises an arcuate segment which terminates in an arcuate front surface for engaging the pole **13**. The base portion **40** is generally conical and has a central aperture **48** for receiving the bolt **33** and an inner edge **50** which extends inward inwardly beyond the surfaces **47** on ribs **38** for engaging the underside of pole **13**.

In assembly of the anchor base **12** to the pole **13** a plurality of collet members **19**, preferably three or more, are loosely secured within the base member **18** by bolts **33**. The pole **13** is supported in a horizontal position and the anchor base **12** is then slid over the end of the pole shaft until the lower end of the pole engages the base portions **40** of the collet members **19**. Each of the bolts **33** is then tightened until the collets are snugly in place and the bottom edges lie in substantially the same plane. Each of the collet members **19** are then hammered so that they are driven between the bearing surface **27** and the pole **13** and then retightened. This process is repeated until the desired degree of contact pressure between the collet members **19** and the bearing surface on the pole are achieved.

When the bolts **33** are first tightened to move the collet members **19** into position, the latter will bear against the pole **13** and the surface **27** only at a few localized high spots due to inevitable tolerance differences in their contours. After the collet members **19** have initially been drawn into place by the moderate force that the bolts

33 are able to exert, substantial further motion occurs when high impact forces are applied as the result of hammering. Forcing the collet members **19** into place under high pressure will create localized bending loads in the pole **13** and the shell portion **25** adjacent to the localized contact points between those areas and the members **19**. These localized bending loads will cause the pole **13** and the shell portion **25** to deform until they substantially match the contour of the collet members **19**.

After the engaged portions of the pole **13** and the shell portion **25** are in substantial distributed engagement with the collet members **19**, further motion of the latter will be substantially resisted. The additional insert forces will then result in almost pure circumferential compressive stress in pole **13** and circumferential tensile stress in shell portion **25**. Additional deformation in these components due to pure tensile stress loads without additional bending will be minute.

In service, the pole **13** acts in a manner similar to a cantilever beam attached to its foundation by means of the base assembly **12**. The normal in-service loads applied to the pole **13** result in stresses in the pole and the base member **18** which are quite similar to the stresses resulting when the collet members **19** are driven into place. However, because of the initial deformation and prestressing which occurs during the high pressure insertion of the collet members **19**, undesirable deflection at the upper end of the pole **13** as a result of deformation in the base member **18** and the lower end of the pole **13** will be minimized.

The purpose of the rib portions **38** on the collet members **19** is to provide a bearing area with the pole **13** over a widely distributed area. However, it is not necessary that the members **19** bear over their entire areas against the pole **13**. For this reason it is possible to employ the rib portions **38** on the collet members **19** rather than a more expensive solid member. It has been found that adequate bearing area can be obtained if the height of the collet members **19** is at least substantially equal to the diameter of the pole **13** at its lower end, although this is by no means intended to be limiting.

It can be seen that the anchor base assembly **12** according to the instant invention can be assembled to the pole **13** without welding and without the necessity for close tolerances therebetween. In addition the anchor base assembly **12** can be assembled to the pole **13** regardless of the thickness gauge of the two members. In addition broken or damaged anchor base assemblies **12** or poles **13** may be field replaced.

While only one embodiment of the instant invention has been shown and described, it is not intended that the invention should be limited thereto but only by the scope of the appended claims.

I claim:

1. In an assembly for supporting electrical apparatus, the combination of:

an elongate pole shaft having a longitudinal axis and an outer surface means adjacent its lower end;

an anchor base having internal surface means displaced from and disposed in surrounding relation to said outer surface means on said pole shaft, said anchor base including a hollow shell portion which is open at its upper end for receiving said pole shaft and wherein said internal surface means is inclined toward said pole from its lower end to its upper end; and

a plurality of collet members disposed between said surface means, each of said collet members having inner and outer face portions which are substantially complementary to said surface means for being moved into high pressure frictional engagement therebetween to locally deform and prestress said base and said pole shaft to minimize deflection in said pole as a result of loading at the upper end thereof, the lower end of said anchor base also being open for receiving said collet members; and

said collet members each including a base portion extending inwardly beyond the surface of said pole shaft for supportingly engaging the lower end thereof.

2. The assembly set forth in claim **1** wherein the outer face portion of each of said collet members includes an elongate slot extending in a direction generally parallel to said axis, a plurality of boss means formed on said inner surface means for receiving said slots, and bolt means extending between the base portion of each of said collet members and one of said boss means and along said slots for moving said collet members into said high pressure engagement between said surface and said pole.

3. The assembly set forth in claim **1** wherein at least a portion of said inner surface means is generally a conical section.

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