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Lewis

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[54] **FRANGIBLE LIGHTING POLE**

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[52] **U.S. Cl.** **52/98,** 52/296, 52/726, 138/92, 138/100, 240/84

[51] **Int. Cl.** **F21s 1/10**

[58] **Field of Search** 52/295, 296, 98, 52/99, 28; 94/1.5; 138/98, 100, 102; 240/84; 285/2, 3; 256/13.1

[56] **References Cited**

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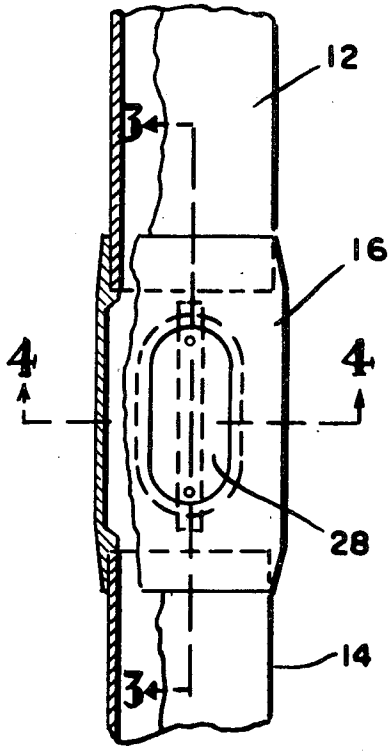
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[57] **ABSTRACT**

This invention relates to a pole for mounting a lighting fixture that has a frangible section close to the ground level that is adapted to break upon impact by an automobile as a safety measure. The principal feature of the invention is the provision of a tubular coupling member interconnecting upper and lower sections. The lower section is driven into the ground; the upper section elevates the lighting fixture, and the tubular section is designed to break in response to the lateral impact force of an automobile.

4 Claims, 4 Drawing Figures



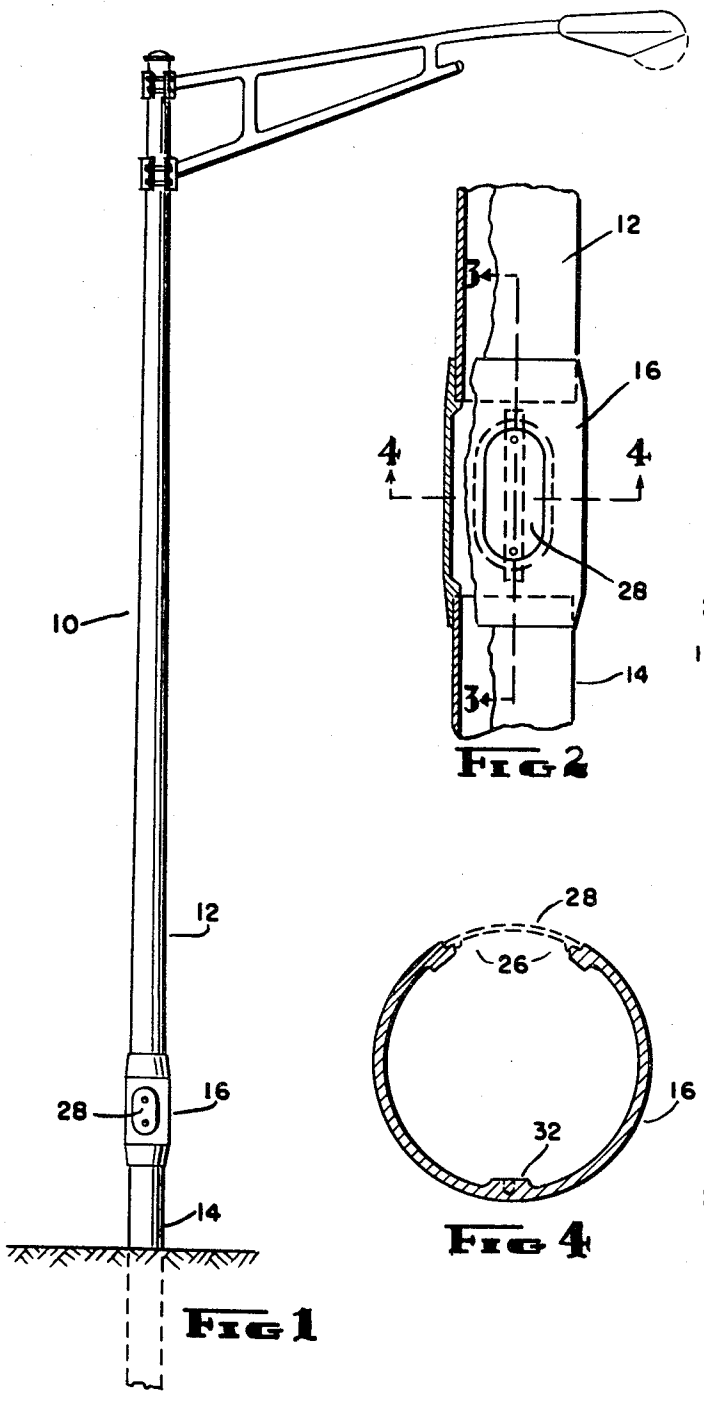


FIG 1

FIG 2

FIG 4

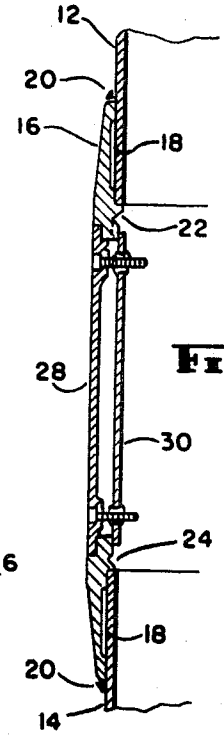


FIG 3

FRANGIBLE LIGHTING POLE

This invention relates to lighting poles and other standards that are mounted beside highways and roadways and is particularly concerned with a lighting pole which includes a frangible section adjacent its lower end as a safety measure.

Lighting poles and other standards that are mounted adjacent roadways create a hazard to the vehicular traffic carried on the roadways. Accordingly, roadway authorities quite commonly now specify that such poles and standards must be capable of fracturing under the impact of a vehicle. Needless to say, the purpose of this requirement is to reduce the damage done to a vehicle or its occupants upon impact with a pole.

The requirement for frangibility has given particular difficulty to the manufacturers and installers of tubular metal poles. Heretofore, such poles have mainly been manufactured in one piece by roll forming, extrusion or spin forming. Such manufacturing operations are not amenable to the provision of the required frangible section during the manufacturing operation. Further, any attempt to provide a weakened section adjacent one end subsequent to the manufacturing operation is a difficult matter.

It is, therefore, an object of this invention to provide a lighting pole or other roadway standard which includes a frangible section having a more predictable breaking strength relative to similar poles known heretofore.

It is a more specific object of the invention to provide an inexpensive and reliable frangible lighting pole in which the frangible section is separately manufactured from the main body of the pole.

In accordance with the present invention, a frangible lighting pole or other standard to be mounted beside highways and roadways comprises a three-piece shaft assembly consisting of a lowermost member to be sunk into the ground, an uppermost member for carrying the lighting fixture or sign involved and a tubular coupling member for interconnecting said uppermost and lowermost members, said coupling member having a lower impact strength than said other members and constituting the frangible section of said pole whereby to provide a predetermined fracture plane.

The invention will be more thoroughly understood from the following description of a preferred embodiment thereof as read in conjunction with the accompanying drawings.

In the drawings,

FIG. 1 is a side elevation view of a typical roadside mounted lighting fixture employing a pole in accordance with the preferred embodiment of the invention;

FIG. 2 is an enlarged side elevation view, partly in section, of the lower end of the pole shown in FIG. 1;

FIG. 3 is an enlarged cross-sectional view taken along the line 3—3 of FIG. 2 but showing only the left-hand side of that section; and

FIG. 4 is an enlarged cross-sectional view taken along the line 4—4 of FIG. 2.

Referring to FIG. 1, the lighting pole 10 of the illustrated preferred embodiment of the invention is essentially comprised of three parts, namely, an uppermost and longer part 12, a lowermost part 14 buried in the ground, and a frangible coupling 16.

The upper and lower members 12 and 14 are manufactured of a metal alloy which is fairly ductile and strong, such as wrought aluminum. Such ductility and strength is required if the pole as a whole is to be capable of resisting wind load stresses. Indeed, this requirement for strength and ductility in the pole as a whole means that in the absence of a frangible section, the pole would not be capable of readily breaking under the impact of a vehicle.

In accordance with the invention, a frangible member 16 is placed in the pole at a height above the ground approximating the height of an automobile or truck bumper. Member 16 is formed of a relatively brittle alloy as compared to the material used in sections 12 and 14 and where the latter members are formed of wrought aluminum, member 16 would preferably be formed of an aluminum casting having low impact strength.

The strength of the coupling member is adapted to break in response to lateral impact force of predetermined magnitude and, in practice, this is achieved by selecting a proper metal alloy. Member 12, the tubular connector 16 and the lowermost member 14 can each be conveniently made from aluminum, in which case the ductility or percent elongation of the member 12 and member 14 is in the neighbourhood of 11 to 13 and the ductility or percent elongation of the connector member 16 is in the neighbourhood of 2 to 5. The lower ductility reduces the impact strength. By providing a connector member having a lower impact strength an the impact strength of the pole 10, one can insure that the assembly will fail at the connector 16 as required.

Coupling 16 essentially consists of a tubular sleeve adapted to fit over the upper end of member 14 and to receive the lower end of member 12. It may connect with these members either by a simple press fit or by a slit fit using a bonding agent. In the latter case, the inner diameter of the upper and lower ends of the sleeve-like coupling is rebated as at 18 to provide a pair of annular spaces to receive the bonding agent which would preferably consist of a structural adhesive. It will be appreciated that coupling 16 need not necessarily fit over sections 14 and 12 as shown but that it could connect in other ways; for example, it could fit within these members. It may also be desirable to provide a tapered fitting, especially in cases where the sections 14 and 12 fit within the coupling 16.

As a further preferred expedient, the sleeve may be welded to either or both members 12 and 14 by an annular weld such as that shown at 20 in FIG. 3. An alternative to welding is to use an adhesive such as an epoxy resin. In some cases the latter securing means may be desirable because it does not involve the application of heat to the metal. Regardless of the manner in which the sleeve is attached to members 12 and 14, its inner face is provided with a pair of annular shoulders 22 and 24 against which the ends of members 12 and 14 are abutted.

It is also preferred that coupling 16 be provided with a hand access hole 26 covered by a removable cover plate 28. This hole permits inspection of the wiring within the pole and particularly provides access to the usual fuse bracket employed in such poles when the latter are used as lighting poles. Cover plate 28 preferably also is formed of aluminum and is held in place by a draw bar 30. It should also be noted that it is preferred to form an integral boss 32 on the inside of coupling 16

which can be drilled and tapped for receiving a grounding stud and the fuse bracket.

What I claim as my invention is:

1. A pole as claimed in claim 4, in which the inside surface of said coupling member is provided with a pair of annular recesses surrounding the lower end of said uppermost member and the upper end of said lowermost member, said recesses being filled with an adhesive for bonding said coupling member to said other members.

2. A pole as claimed in claim 1, in which said coupling member is welded to said other members.

3. A pole as claimed in claim 2, in which said uppermost and lowermost members are formed of wrought aluminum, said coupling member being formed of a relatively brittle cast aluminum alloy.

4. A pole for mounting a lighting fixture or the like beside a roadway, said pole comprising a lowermost member to be sunk into the ground, an uppermost member for carrying the fixture involved, and a yieldable tubular coupling member in telescoping relation with said uppermost member and in telescoping relation with said lowermost member whereby to interconnect said uppermost and lowermost members, said coupling member having a strength adapted to yield and cause the coupling member to break in response to a lateral impact force of predetermined magnitude applied thereto or to said uppermost and lowermost members adjacent said coupling member, said uppermost member being press fitted within the top end of said coupling member, the bottom end of the coupling member being press fitted over the upper end of the lowermost member, the lower end of the uppermost member and the upper end of the lowermost member being spaced from one another within said coupling member, said coupling member carrying a pair of spaced, annular shoulders on its inside surface, the lower end of said uppermost member being abutted against one of said shoulders, the upper end of said lowermost member being abutted against the other of said shoulders, said coupling member being provided with an inspection access opening, said opening having a removable cover plate.

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