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## POLE STRUCTURE

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3 Claims. (Cl. 52—727)

This invention relates to an improved pole structure of the type suitable for and finding utility as a component of a room divider, a baluster, a lamp support, table and chair legs, counter supports, and having other related uses. More particularly the invention is directed to a metal-reinforced composite pole having a hollow metallic core to which is bonded a plurality of encircling elongated segments consisting of wood, plastic or similar materials.

Also included within the scope of this invention are methods for constructing the improved poles of the invention. The improved poles made in accordance with the teachings of this invention have been found to exhibit extraordinarily stable structural characteristics and to have unusually great mechanical strength.

The prior art poles which find utility in some of the applications to which the present invention is directed have one or more objectionable features which limit and impair their usefulness. In some instances the poles are made entirely of wood and are therefore, susceptible to warpage. Such poles, particularly when relatively long but of small diameter, also lack the structural stability and strength which are important for specific installations. Prior art structures in which two or more linear units are coupled or otherwise fastened or connected endwise for the purpose of providing an integral unitary pole have proved to be unstable. This instability is due, in some cases, to the particular coupler mechanisms used. In other instances the stress forces to which the poles are subjected in ordinary use have caused splitting of the ends of the units or have caused sleeves and their mating members embedded in the ends of the units to become loose. The drilling of holes endwise into pole ends to provide cavities for receiving the cooperating mating members poses special problems of axial alignment, and the drilled openings greatly weaken the pole in the very region where lateral stresses are most likely to be applied.

It is a principal object of the invention to provide a pole structure which obviates many of the objectionable features of related prior art devices.

Another object of the invention is to provide an improved pole structure which is dimensionally stable and which will not warp or distort in use.

Still another object is to provide a pole structure which is adapted for installation as an in-line series of two or more units to provide a pole of any desired length.

Additional objects and aims of the invention include the following:

To provide a pole structure of stable, connected multiple units in which the linking or coupling of the units is achieved by improved interlock means;

To provide a pole structure consisting of multiple linear units which are easily and simply coupled and uncoupled and which are rigid and stable to provide an integral unitary firm structure when assembled;

To provide a pole structure which has increased compressive strength and rigidity; and

To provide an improved method of fabricating the pole structure of the invention.

Other and further objects and advantages of the invention will become apparent from a reading of the following specification taken in conjunction with drawing in which:

FIGURE 1 is an over-all schematic representation of

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a pole embodying the features of the present invention;

FIGURE 2 is an enlarged, sectional view of the pole of the invention taken along the line 2—2 in FIGURE 1;

FIGURE 3 is an enlarged sectional view taken substantially along the line 3—3 in FIGURE 1;

FIGURE 4 is an exploded view showing structural features and the manner of assembling the pole of the invention; and

FIGURE 5 is an end view of one of the starting structural units used in fabricating the pole of the invention.

Referring more particularly to the drawings, there is shown in FIGURE 1, for the purpose of illustrative disclosure, a preferred embodiment of the pole of the invention. In the preferred embodiment depicted, the pole 10 illustrated comprises, as best shown in FIGURE 4, an internal tubular core 11 enclosed in encircling segments 12 and 13 which are bonded to the core 11 and to each other by means of an adhesive 14, a plastic or resin, or other suitable bonding material. (See FIGURE 2.) The tubular core 11 is preferably a cylindrical metal tube, although other mechanical shapes may be employed. Steel, bronze, brass or aluminum and other equivalent materials are suitable. Alternatively, the core 11 may be a plastic sleeve or a reinforced plastic sleeve selected from plastic materials including polyesters, polystyrenes, phenolic and aldehyde compositions, epoxies, and other thermoplastic or thermosetting resins which have the requisite rigidity and strength. In a preferred embodiment of the invention the core 11 is of a metal.

The segments 12 and 13 bonded to the core 11 are preferably of cabinet-type woods and may be oak, maple, mahogany, walnut, fruit-woods and others. In other poles made in accordance with the practice of the present invention the core-encircling segments may be of plastic or wood and plastic compositions.

The adhesive 14 or bonding material may be of any suitable types and formulations, as are well known in the art, and the selection of any particular preferred bonding agent will be determined and dictated by the specific combination of cooperating pole components (core and surrounding material) involved. Natural glues such as hide glues may be used, and synthetic formulations of resins or plastics, such as epoxies, find particular utility in the practice of the invention.

The metal core 11 and its associated bonded encircling segments 12 and 13 which comprise the unit pole structure of the invention, may be any desired length to meet the particular requirements of various ultimate uses. In a preferred procedure, however, a basic unit of a finite convenient length is provided, or basic units of several convenient lengths, in the range of about 18 to about 60 inches, are fabricated. Table and counter supports and legs and room dividers and poles for lamp supports are then made to any required length by simply coupling two or more basic units.

Any suitable coupling means which ensures rigidity, stability and physical strength in the final multiple pole structure may be used. In accordance with the practice of the present invention a preferred coupling is provided by special mating end structures as shown in FIGURE 4. The metal core 11 projects beyond the encircling wood segments 12 and 13 at one end 14 of the basic unit pole structure 10 to provide a tubular extension arm 15. The extension arm 15 is reduced at a shoulder 16 adjacent the end of the wooden segments so that the outer diameter of the integral extension arm 15 is substantially equal to but slightly less than the inner diameter of the metal core 11 to ensure a close sliding frictional fit between the tubular extension arm 15 of one basic unit and the internal metal core 11 of a second basic unit. A slot or notch 17 extending lengthwise of and inwardly from the end 18 of the arm 15, and having a transversely offset

channel 19 constitutes a part of an interlock means for coupling separate sections of the pole of the invention. The metal core 11 is flush with the encircling wooden segment 12 and 13 at the other end 20 of the basic unit. Inwardly of the end of the metal core, at a distance corresponding to the distance between the other shoulder 16 of the core and the transversely offset slot 19, the core 11 is provided with a boss 21 which is received through the slot 17 and into the offset channel 19 when two units are coupled. When the boss 21 is in position in the channel 19, the facing ends 20 and 22 of the coupled units meet and abut upon each other in a manner to conceal the fact that the resulting pole consists of two (or more) separate sections.

The novelty of the present invention lies not solely in the form and structure of the segmented pole itself but also in the method of fabrication of the component sections. The steps involved are described below with reference to a wooden pole. A block or blank 23 of length of wood of the required dimensions and which is ordinarily originally rectangular in cross section, as shown in FIGURE 5 is subjected to a shaping or reshaping operation which consists in planing the surfaces or removing two of the adjacent linearly extending edges 24 and 25 of the blank. If the final finished section is to have flat planar surfaces, the initial shaping and sanding steps may be modified and are conveniently carried out at this time. In a preferred embodiment, however, the poles are ultimately to be turned on a wood lathe to provide various ornamental and aesthetically appealing designs.

The shaped blank 23 is subjected to a routing operation in which a "sticker" or similar machine is used to gouge or scoop out a channel 26, semi-circular in cross section, and extending centrally, along the length of the blank in that face 27 opposite the surface 27a the edges 24 and 25 of which have been removed. If preferred, the "routing" operation may be carried out before the "shaping" operation. The diameter 28 of the linearly extending semi-circular channel is preferably somewhat less than the width 27w of the face or surface 27 in which it is formed. A preferred technique is to center the channel equidistant from the edges of the surface 27 to leave a residual portion of the plane surface 27 on either side 29 and 30 of the channel 26. The diameter 28 of the channel 26 is substantially equal to the outside diameter of the tubular core 11.

An adhesive, glue, or other bonding composition 14 is applied to two preshaped and routed blanks 23 to coat the channels 26 and the adjacent side surfaces 29 and 30 of each. One of each of the adhesive-coated blanks 23 is positioned on either side of a tubular metal core 11 and pressed firmly there against to define a structure in which the metal core 11 contacts each of the channels 26, through the adhesive 14, and the respective surfaces 29 and 30 of the core-enveloping blanks abut one another along their contiguous faces. Clamps or other retaining devices may be used to hold the various parts firmly positioned during the drying or setting of the adhesive. It is obvious that instead of the two wooden blanks, each having a semi-circular channel and each comprising one-half of the final core-enveloping structure, three, four or more modified pie-shaped or wedge-shaped sections with their requisite arcs of inside channels may be used.

After bonding of the wood sections to the metal core, the assembly may be turned on a lathe to provide any desired external configuration. Finally the wood surface is finished using conventional and well known cabinet fabricating techniques and materials. As has been pointed out, plastic may be used as a substitute for the wood. In such modifications and variations of the pole structure, the desired design for or shaping of the outer surface can be achieved by molding techniques in addition to or instead of by lathe operations.

It is apparent that the sectional structures of the invention may take any of several basic forms. For ex-

ample, a section or pole segment may be fabricated and assembled so that the metal core is flush with its encircling members at both ends of the unit. Alternatively, the metal core may project beyond the wooden or plastic sheath or envelope at both ends of a structural unit. In a third variation, one end of the metal core may be flush with the plastic or wood sleeve while the other end extends beyond the sleeve. In each case suitable coupling means, such as internal threads and/or locking channels for the flush arrangements, and internal and external threads and bosses, etc., for the extending or protruding metal core may be provided to couple one section to another or to connect any given section to cooperating structures. In a preferred embodiment of the invention, the metal core extending beyond the composite section is adapted to couple with or to connect to a transverse plate or flange.

As described with respect to preferred embodiments of the invention, the metal core is preferably a hollow tube. While hollow cores have obvious advantages over solid cores for many purposes, it is within the inventive concept of the present invention that the core may take any form or shape. Solid cores of either round or polygon section find utility for particular applications. It is obvious that in the case of hollow cores, tubes or conduits of triangular, rectangular, or of other polygon cross sections are useful.

The terminal ends of a single section or of multiple coupled sections of the pole of the invention may be provided with means for connecting end extensions or support rods (not shown) of the type ordinarily used in pole lamp structures. The extensions may be adjustable in length and may include spring-loaded extension means which are conveniently received and hidden within the metal core of the pole. If desired, the end of the metal core may be threaded 31 to facilitate attachment of additional functional elements. Alternatively, press-fit connections may be relied upon.

The improved pole structures of the present invention find particular utility as lighting fixtures. When intended for this use they are conveniently provided with openings 32 for accommodating the requisite electrical cords and for switch connections. These openings extend through the wall of the metal core and through the enveloping wooden or plastic segments as well.

While disclosures of preferred embodiments of the products and of preferred methods for fabricating the products of the invention have been provided, it will be apparent that numerous modifications and variations thereof may be made without departing from underlying principles of the invention. It is, therefore, desired by the following claims to include within the scope of the invention all such variations and modifications by which substantially the results of this invention may be obtained through the use of substantially the same or equivalent means.

What is claimed is:

1. A pole lamp comprising a first and a second pole section,
  - said first pole section consisting essentially of a first tubular metal core;
  - a plurality of elongated first wooden segments encircling said first core and extending along the length thereof; adhesive means bonding said first wooden segments to each other and to said first core to define an annular sleeve surrounding said core and contiguous to and coaxial therewith;
  - said first metal core being flush with said first wooden segments at one end of said section and extending axially beyond said segments at the other end of said section to define an extension arm integral with said core and coupling said first section to said second section;
  - said second pole section comprising a second tubular metal core;

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a plurality of elongated second wooden segments encircling said second core and extending along the length thereof, said second wooden segments being coextensive with said second core; adhesive means bonding said segments to said core to define an annular sleeve surrounding said second core and contiguous to and coaxial therewith; and

said second core of said second section having an opening extending axially endwise therein and defining an elongated socket receiving said integral extension arm of said first core in sliding frictional engagement therewith and coupling said first and said second pole sections.

2. An electrical illuminating fixture of the pole lamp type and comprising a first pole and a second pole section, said first pole section consisting essentially of a first tubular metal core;

a plurality of elongated first wooden segments encircling said first core and extending along the length thereof; adhesive means bonding said first wooden segments to each other and to said first core to define an annular sleeve surrounding said core and contiguous to and coaxial therewith;

said first metal core being flush with said first wooden segments at one end of said section and extending axially beyond said segments at the other end of said section to define an extension arm integral with said core and coupling said first section to said second section;

said extension arm having a slot at the end thereof, said slot extending lengthwise of and inwardly from said end of said first arm and having a transversely offset channel;

said second pole section comprising a second tubular metal core;

a plurality of elongated second wooden segments encircling said second core and extending along the length thereof, said second wooden segments being coextensive with said second core; adhesive means bonding said segments to said core to define an annular sleeve surrounding said second core and contiguous to and coaxial therewith;

said core of said second section having an opening extending axially endwise therein and defining an elongated socket receiving said integral extension arm of first core in sliding frictional engagement therewith and coupling said first and said second pole sections; and

a boss integral with said second core and positioned inwardly of the end thereof a distance corresponding

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to the linear displacement of said transversely offset channel from the end of said annular sleeve, said boss entering into and engaging said offset channel when said extension arm is received in said socket.

3. A pole lamp comprising a first and a second pole section,

said first pole section consisting essentially of a first tubular metal core;

a plurality of elongated first wooden segments encircling said core and extending along the length thereof; adhesive means bonding said first wooden segments to each other and to said core to define an elongated annular sleeve surrounding said core and contiguous to and coaxial therewith; said first metal core extending axially beyond said first wooden segments from the ends thereof to define integral tubular extension arms at opposed ends thereof connecting said first core to said second section;

said second section comprising a second tubular metal core;

a plurality of elongated second wooden segments encircling said second core and extending along the length thereof, said second wooden segments being coextensive with said second core; adhesive means bonding said segments to said core to define an elongated annular sleeve surrounding said second core and contiguous to and coaxial therewith; and

said second core of said second section having an opening extending axially endwise therein and defining an elongated socket receiving one of said extension arms of said first core in sliding frictional engagement therewithin to couple said first and said second pole sections together to form a composite pole lamp shaft.

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**UNITED STATES PATENT OFFICE**  
**CERTIFICATE OF CORRECTION**

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It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 5, line 32, strike out "first".

Signed and sealed this 24th day of May 1966.

(SEAL)

Attest:

**ERNEST W. SWIDER**

Attesting Officer

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Commissioner of Patents