

[54] ALIGNMENT DEVICE

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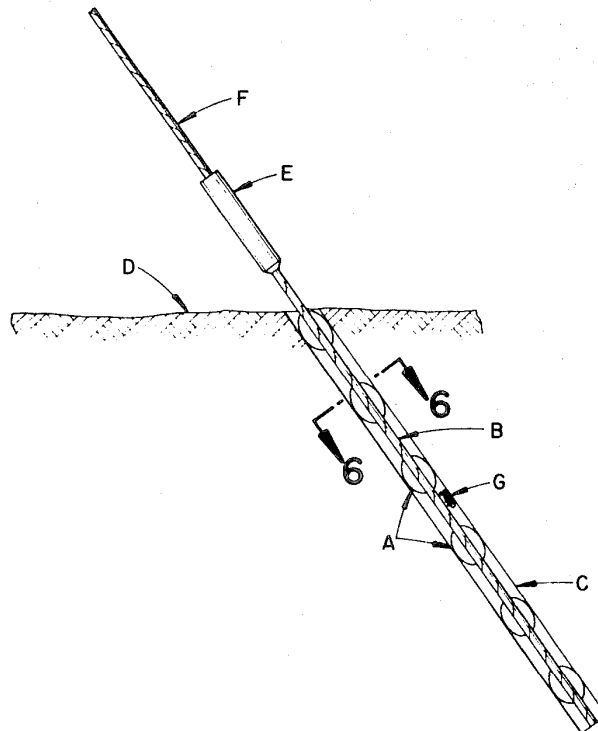
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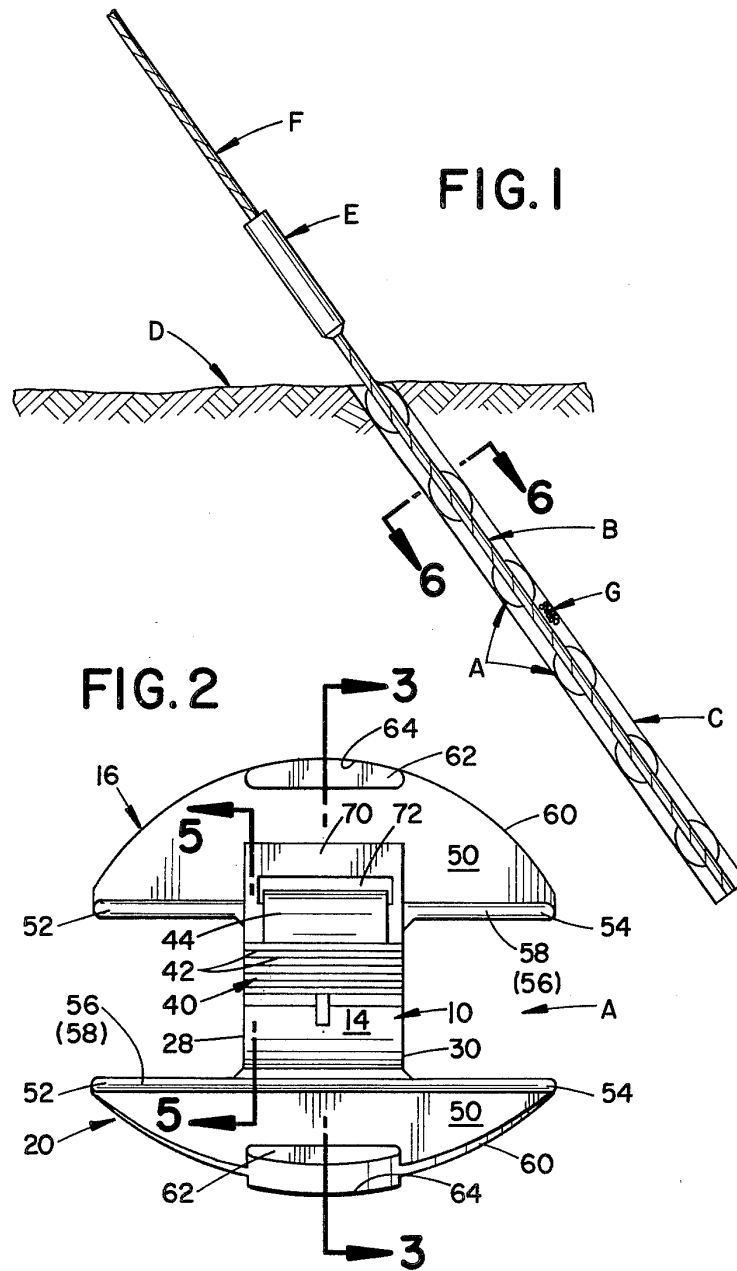
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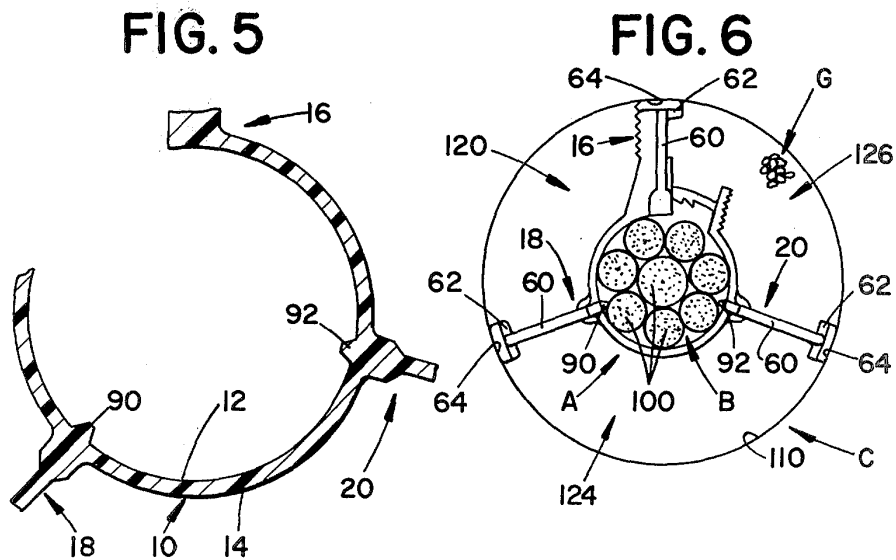
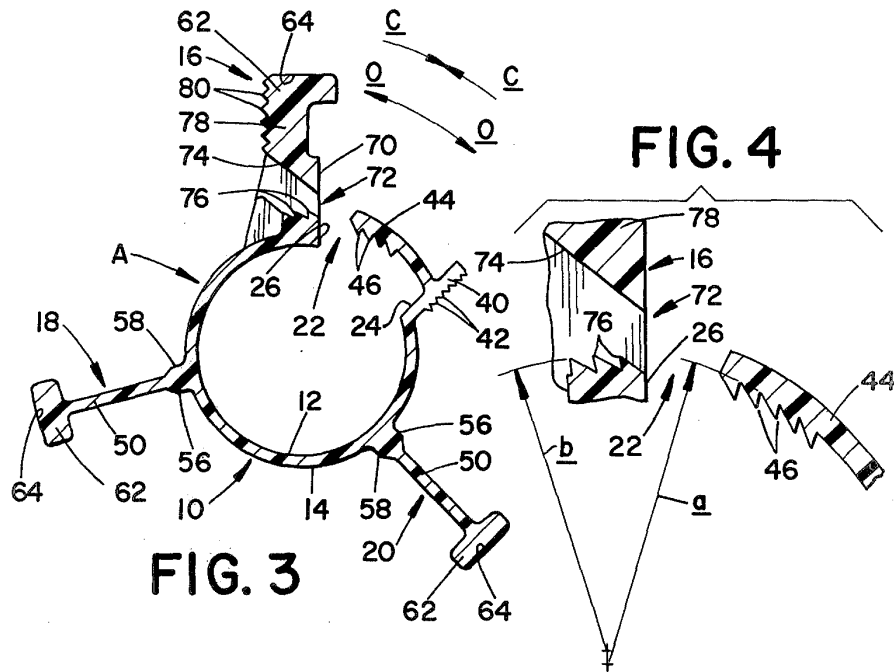
[57] **ABSTRACT**

An alignment device adapted to position an elongated member such as a cable or the like within the interior of an associated enclosure. The device includes a hollow collar adapted to be placed in a close surrounding relationship with an axial section of the elongated member. The collar includes a longitudinal split in the side wall thereof between opposed spaced apart collar peripheral ends. These ends may be moved apart from each other for installing the device on the elongated member and then moved back toward each other to place the device in a close surrounding operative position thereon. An adjustable locking means facilitates locking the collar at the peripheral ends in the operative position and simultaneously prevents axial displacement of the peripheral ends relative to each other. A plurality of supporting legs extend outwardly of the collar at spaced intervals therearound and include support feet. These support feet are configured and positioned to cooperate with the interior walls of an associated enclosure when the device is inserted thereto for maintaining the elongated member in some desired spaced relationship therein. Inwardly extending gripping means may be included on the collar interior for engaging the elongated member in the collar operative position for reducing the potential for relative movement therebetween. The alignment device preferably comprises a one piece molded plastic construction. Typically, a plurality of the devices are affixed to the elongated member at spaced intervals therealong for positioning it within an elongated enclosure over the coextensive lengths thereof.

22 Claims, 6 Drawing Figures







## ALIGNMENT DEVICE

## BACKGROUND OF THE INVENTION

This invention pertains to the art of alignment devices and more particularly to an alignment device for locating and retaining an elongated member at some predetermined position within an outer cover or enclosure.

The invention is particularly applicable to use in locating an anchor cable for guy lines within an elongated opening or hole extending beneath ground level and will be described with particular reference thereto. However, it will be readily appreciated by those skilled in the art that the invention has far broader applications and may be advantageously utilized for many other applications in many different environments where it is desired to locate some elongated member in a predetermined position within an associated housing or casing.

In anchoring some guy lines for electrical power line towers or the like, an elongated anchor cable for the guy line is fixedly secured in an axial disposition beneath ground level. The lower end of the guy line is fixedly secured to the top end of the anchor cable adjacent ground level. The number of such guy lines and anchoring devices is generally dependent upon the type and size of the tower itself. In some instances, however, the anchor cables will extend to a depth of up to sixty feet beneath the surface of the ground in order to provide the necessary anchoring strength. Typically, a hole or enclosure of the appropriate length is first drilled in the ground. Thereafter, the anchor cable is placed within the hole and the hole filled with a grout-like material for purposes of rigidly affixing the anchor cable therein. In order to obtain an optimum anchoring relationship between the anchor cable and hole or enclosure, it is desired that the anchor cable be centrally or coaxially positioned within the hole over the entirety of the coextensive lengths thereof. Since the length of the hole may, again, be as much as sixty feet, and since the anchor cable itself is somewhat flexible, a number of spacer or alignment members must be interposed between the anchor cable and hole at periodic intervals in order to maintain the desired relative positioning between the cable and hole. Such spacer or alignment members must also allow the grout-like material to be passed thereby in order to fill the hole or enclosure therewith.

There have heretofore been a number of different types and styles of such alignment devices employed in this particular environment. However, all of these devices have had certain drawbacks or disadvantages to their use. For example, some prior devices required that they be "strung" onto the anchor cable from one end thereof which required an inordinate amount of anchor cable preparation time. Moreover, if one or more of the alignment devices have to be subsequently removed for replacement, it was also necessary to remove all the adjacent previously or subsequently strung alignment devices. Some prior alignment devices included means for fixedly securing the alignment devices to the anchor cable at spaced locations therealong but here, again, an inordinate amount of anchor cable preparation time was required. Such securing means typically comprise tape, separate clamps and the like. Still other prior alignment devices did not facilitate ease of access to the elongated hole once the anchor cable and plurality of spaced apart alignment devices were inserted thereinto. This then caused difficulties with the proper and complete filling

of the hole with grout-like material. Moreover, still other prior alignment devices included support leg constructions which engaged the hole or enclosure internal wall in a manner which caused binding therewith and, in some instances, damage to the spacers themselves. A still further disadvantage to prior alignment devices resides in the fact that some comprise multi-piece constructions necessitating difficult assembly onto the anchor cable.

On the basis of the foregoing problems, it has been considered desirable to develop a spacer or alignment device particularly adapted for use in guy line anchor cable applications which would meet and overcome the above noted problems. To that end, such a device would desirably accommodate installation generally transversely onto the anchor cable at some desired position therealong so as to eliminate the need for threading a plurality of the devices thereonto from one end thereof. The device should comprise a single component and should not require any separate parts or fastening means. Installation onto the anchor cable should be possible without the use of any special tools and preferably, with no tools at all. The device should also facilitate tight mounting thereof around the periphery of the anchor cable so that it cannot slip longitudinally or axially along the cable during cable installation into the casing. The means used to obtain a tight mounted relationship around the anchor cable should also facilitate some adjustment to take any variations in the anchor cable outside diameter into proper account. The alignment device should also be configured so that the anchor cable may be withdrawn from the hole or enclosure prior to grouting should such withdrawal become necessary for any reason. In that same vein, the alignment device itself should be readily removable from the anchor cable should it become necessary for any reason. The alignment device should also provide sufficient clearance between the outside diameter of the anchor cable and the hole internal wall to permit introduction of the grout-like material into the entire length of the hole. Finally, such a device should be readily slidable with the anchor cable into the hole to eliminate the potential for any binding during assembly.

The subject invention overcomes the foregoing problems and meets the above noted design criteria in providing an alignment device particularly useful in locating and mounting an anchor cable within an elongated anchor cable hole or enclosure in a guy line anchoring environment. However, the subject invention is also deemed equally applicable to use in aligning an elongated member within the interior of a housing or enclosure for varied applications in many different environments.

## BRIEF DESCRIPTION OF THE INVENTION

In accordance with the present invention, there is provided a new and improved alignment device which allows an elongated member to be fixedly located in a predetermined desired position within the interior of an associated enclosure.

More particularly, the alignment device is comprised of a hollow collar adapted to be placed in a surrounding relationship with an axial section of an elongated member. The collar is generally longitudinally split so as to define a peripheral space between spaced apart opposed peripheral ends. These ends are adapted to be selectively moved apart from each other to assume a collar

mounting position allowing the collar to be placed over a desired axial section of the elongated member and toward each other and to then be moved toward each other into a collar operative position wherein the collar is in a generally close surrounding relationship with the axial section. Locking means disposed adjacent the collar opposed peripheral ends permits selective locking of the collar in the operative position. A plurality of supporting legs extend outwardly from the collar a distance whereby the device is adapted to be received within the interior of an associated enclosure with the radial outermost ends of the supporting legs cooperating with the enclosure interior walls. This then allows the device to establish a predetermined located position for the elongated member within the enclosure.

In accordance with another aspect of the present invention, the supporting legs each have a length dimension extending generally longitudinally of the collar with the opposed longitudinal leg terminal ends disposed axially outward from an associated collar end face. In the preferred arrangement, each supporting leg includes an end edge extending arcuately outward from the collar between the leg terminal ends.

In accordance with another aspect of the present invention, the device further includes support feet disposed at the supporting leg outermost ends. These feet extend generally normally outward of the plane defined by the associated supported leg.

According to a further aspect of the invention, the locking means comprises a locking tang disposed adjacent to one of the collar peripheral ends extending over the slot toward the other of the collar peripheral ends. The locking tang includes a first locking member disposed therealong adapted to lockingly engage a second locking member adjacent the collar other peripheral end when the collar is moved toward its operative position. One of the first and second locking members is lockingly adjustable relative to the other to accommodate some variations in the outside cross-sectional dimension of the elongated member to which the device is to be attached.

According to yet a further aspect of the invention, the alignment device further includes means for preventing longitudinal displacement of the opposed collar peripheral ends relative to each other at least when the collar is in its operative position. In the preferred arrangement, this preventing means comprises having one of the supporting legs positioned adjacent the collar other peripheral end with this leg, in turn, including an opening therethrough. This opening is adapted to receive the locking tang at least when the collar is moved to the operative position and thereby prevent the relative longitudinal displacement.

In accordance with still another aspect of the present invention, the collar includes at least one gripping protrusion extending inwardly into the hollow internal area defined thereby. This at least one protrusion is adapted to engage the elongated member when the device is placed in the operative position on an axial section thereof and aids in reducing any potential for relative movement therebetween.

In the preferred arrangement, the device itself comprises a one piece molded plastic construction and the collar peripheral ends have a normal position spaced apart from each other. These ends may be resiliently deflected further apart relative to each other from the normal position for obtaining the collar mounting position and may then be resiliently deflected toward each

other from the normal position for obtaining the collar operative position.

The principal object of the present invention is the provision of a new and improved alignment device for locating and maintaining an elongated member relative to the interior of an associated housing or enclosure.

Another object of the invention is the provision of an alignment device of the foregoing type which is simple to manufacture and easy to use.

Still another object of the invention is the provision of a new and improved alignment device which facilitates reliable installation on an elongated member which is to be axially received within an extremely elongated enclosure.

A further object of the present invention is the provision of such an alignment device which is readily adapted to varied alignment applications in many different environments.

Still other objects and advantages for the subject invention will become readily apparent to those skilled in the art upon a reading and understanding of the following specification.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The invention may take physical form in certain parts and arrangements of parts, a preferred embodiment of which will be described in detail in this specification and illustrated in the accompanying drawings which form a part hereof and wherein:

FIG. 1 is an overall view in partial cross-section of the preferred environment of use for the subject alignment device;

FIG. 2 is a side elevational view of the subject new alignment device;

FIG. 3 is a cross-sectional view taken along lines 3—3 of FIG. 2;

FIG. 4 is a slightly enlarged view of a portion of FIG. 3 showing the dimensional relationships between the locking members of the preferred locking means utilized with the device;

FIG. 5 is a cross-sectional view taken along lines 5—5 of FIG. 2; and,

FIG. 6 is a cross-sectional view taken along lines 6—6 of FIG. 1.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings wherein the showings are for purposes of illustrating the preferred embodiment of the invention only and not for purposes of limiting same, the FIGURES show a plurality of identical alignment devices A secured to an elongated cylindrical anchor cable B and received within an elongated cylindrical hole or enclosure C. Both the hole and anchor cable extend beneath ground level D and a compression type fitting E is employed adjacent ground level to connect the upper end of anchor cable B to the lower end of a guy wire or cable F. Guy wire F extends to a tower or the like (not shown) for purposes of providing support therefor. A grout material G is forced into the interior of hole C and around the length of anchor cable B received therein for fixedly securing the anchor cable in the hole.

While the structural arrangement for the alignment device A to be described hereinafter is particularly adapted for use in the foregoing environment, it should be fully appreciated and understood by those skilled in the art that the device may also be advantageously

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