

[54] **TWIST LOCK JOINT FOR CONCRETE
 FILLED, TELESCOPING SECTIONS**

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Related U.S. Application Data

[63] Continuation of Ser. No. 229,382, Feb. 25, 1972,
 abandoned.

[52] U.S. Cl. **285/290; 61/56; 285/401**

[51] Int. Cl.² **F16L 13/10**

[58] Field of Search..... **285/290, 284, 401;
 403/298, 349, 353; 61/56**

[56]

References Cited

UNITED STATES PATENTS

426,924	4/1890	Costigan	285/290
526,097	9/1894	Anderson.....	285/290
2,234,957	3/1941	Boynton.....	285/290 X
2,702,926	3/1955	Rahaim.....	403/298

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[57]

ABSTRACT

In a column of the type formed from a plurality of
 stacked interlocking sections rigidized with respect to
 each other by the pumping of fluid concrete therein, a
 twist-lock joint formed by mating of outer and inner
 flanges.

6 Claims, 4 Drawing Figures

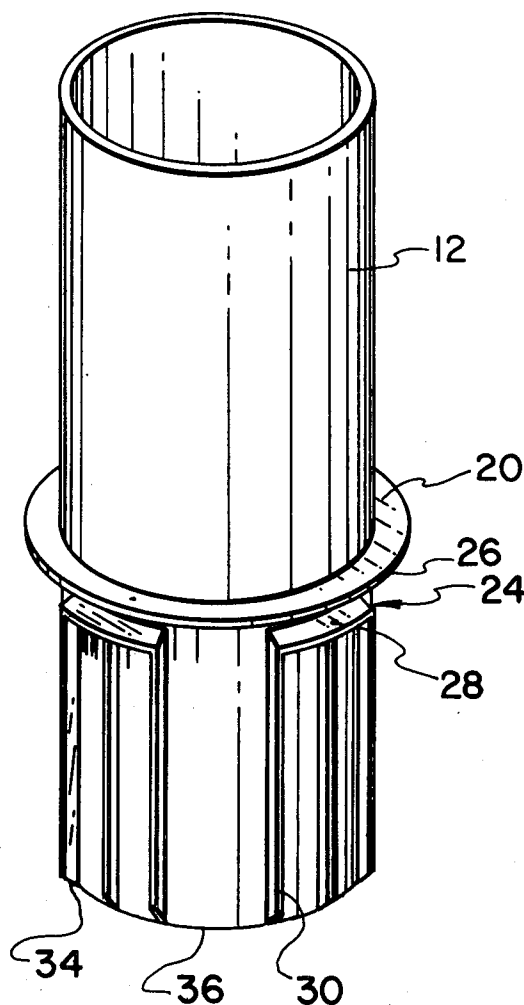


FIG. 1

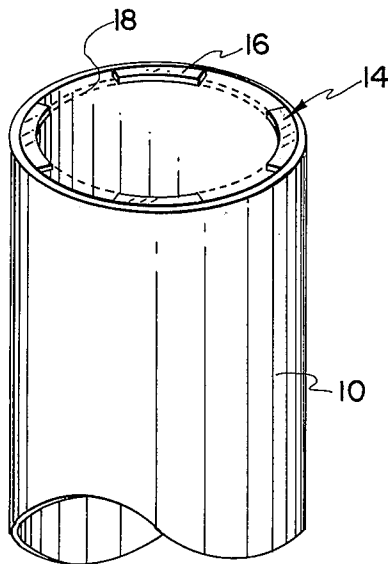
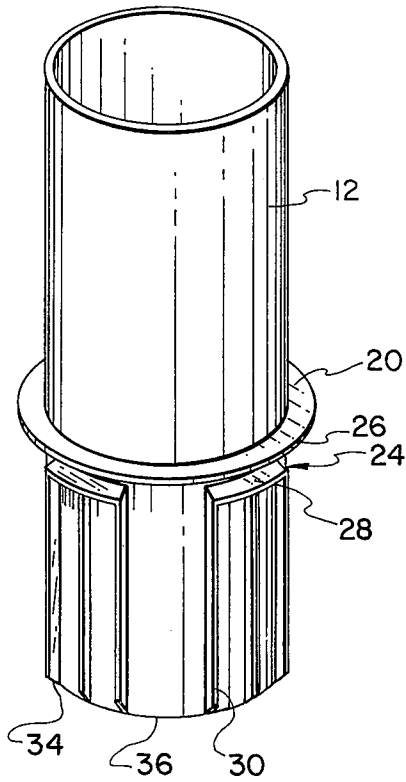


FIG. 2

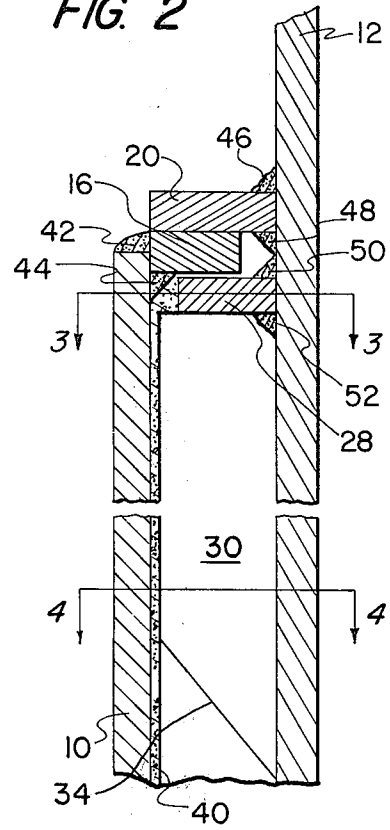


FIG. 3

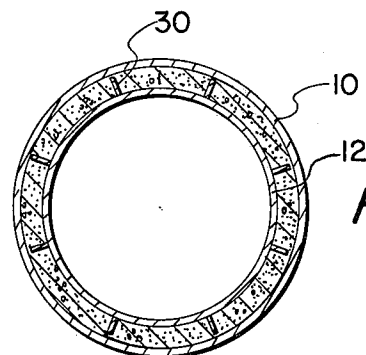
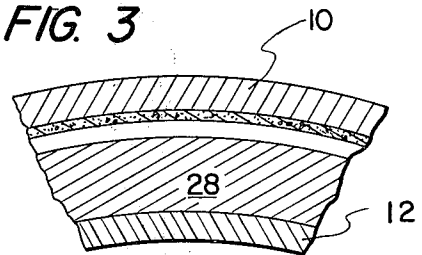


FIG. 4

TWIST LOCK JOINT FOR CONCRETE FILLED, TELESCOPING SECTIONS

CROSS REFERENCES TO RELATED APPLICATIONS:

This application is a continuation of Ser. No. 229,382, filed Feb. 25, 1972, now abandoned.

BACKGROUND OF THE INVENTION

1. Field of the Invention:

Pumping of interlocking stacked sections with concrete so as to develop a vertically rigidized column. Particularly, an interlocking joint for the stacked sections. Numerous previous inventors have attempted to erect vertically extending columns from telescoping sections. However, with the exception of the present inventors, U.S. Pat. Nos. 3,469,358 and 3,471,980, there is no previous showing of pumping of concrete into interlocking sections, so as to permit the concrete to extend throughout the sections, as well as the joints between sections to permanently rigidize a homogeneous unit.

2. Description of the Prior Art

Archer, et al	3,469,358
Archer, et al	3,471,980
Crossan	2,800,737
Habro	3,495,370
Dean	2,903,856

In the above-identified references there is no suggestion of a quick, convenient means for on site locking of the sections with respect to each other.

SUMMARY OF THE INVENTION

According to the present invention a column is formed from an outer telescoping section filled with concrete and having an inwardly extending stop ring secured to its top and an inner telescoping section, having an outwardly extending locking band at its bottom. The outer section stop ring is keyed so as to leave at least three radially inwardly extending flanges which define peripherally spaced slots. The inner telescoping section which is also filled with concrete has an outwardly extending peripheral vertical support band secured adjacent its bottom above at least three radially extending flanges positioned beneath said support band, so as to be registrable with the stop ring peripheral slots of the outer section during extension of the sections and lockingly engageable with the outer section inwardly extending flanges upon twisting of said inner section with respect to said outer section. In addition, at least one longitudinally extending spline is positioned beneath each flange, so as to align the inner section with respect to the outer section, while providing access for concrete filling the vertical interstices defined by the splines between the telescoping portions of the section adjacent the stop ring and locking band.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded perspective view, showing the keying relationship between the splines on the upper or inner section and the slots and flanges defined in the stop ring of the lower or outer section; and

FIG. 2 is an enlarged fragmentary vertical section taken through the interlocking sections, showing vertical support band, juxtaposed with respect to outwardly

extending flange, inner extending flange and longitudinally extending spline.

FIG. 3 is a crosssectional view taken along line 3—3 of FIG. 2.

Similarly, FIG. 4 is a crosssectional view taken along line 4—4 of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENTS:

In FIG. 1 there are illustrated in fragment base or lower, outer telescoping section 10 and inner telescoping section 12. Manifestly, the column may be composed of a greater number of similarly interlocking sections, for example, three, four or more such sections.

Outer telescoping section 10 has a slotted inner peripheral ring, generally defined as 14, affixed to its top and defining a plurality of inwardly extending flanges 16 and corresponding intermediate slots 18. The peripheral flanges of ring 14 may be individually secured to the inside top of outer section 10 by welding as at 42 and 44, as illustrated in FIG. 2.

Inner telescoping section 12 has a vertical support band 20 secured by weldments 46 and 48 to its periphery. As illustrated in FIG. 2 support band 20 may have the same outer diameter as the outer or inner diameter of outer telescoping section 10.

Positioned beneath support ring 20 is a slotted ring 24, defining a plurality of radially extending flanges 28 and intervening slots 26. The radially extending flanges 28 may be individually secured to the section 12 as at 50, 52.

Longitudinally downwardly extending splines 30 depend from the flanges 28 downwardly, so as to be coextensive with the bottom 36 of section 12. The splines 30 define an outer diameter periphery greater than the periphery defined by flanges 28. It is essential that the flanges 28 have a lesser outer diameter than that defined by the splines and that the splines 30 have a slightly lesser outer diameter than section 10 inner diameter. The splines 30 are to be tapered at 34 to assist in inserting upper section 12 into lower section 10.

In the mode illustrated in FIG. 1, the stop ring 14 and the locking band 24 provide inwardly extending flanges 28 and peripheral slots 26 such that during erection splines 30 may be inserted into lock ring slots 18, then the inner section 12 may be rotated so that the flanges 28 register with the flanges 16, thus permanently locking the sections longitudinally with respect to each other after the concrete is inserted.

The present invention has particular application in the locking of the inner section 12 with a base section 10 which is plumbed in concrete in the surrounding earth so as to assure rigid locking of moving sections above with respect to the base section in a concrete-filled telescoping column.

The present invention will have particular application in pumping of those columns embodying two or more stacked sections, for example in monorail systems and the like in the developing of structures between 30 and 40 feet in height. The base section may be set in concrete, then as it is desired to pump the column, the inner sections may be inserted and stacked from the top and twist-locked into place, just prior to pumping of the concrete, thus providing a rigid column.

Manifestly, variations in configuration of the vertical support bands, stop rings or flanges and splines may be used without departing from the spirit of the invention.

We claim:

1. In a column of the type formed from a plurality of interlocking sections stacked with respect to each other and rigidized by pumping of fluid concrete therein, a joint comprising:

A. an outer telescoping section filled with concrete and having:

i. an inwardly extending stop ring secured to its top with at least three radially inwardly extending flanges defining intermediate peripheral slots;

B. an inner telescoping section filled with concrete, having:

i. an outwardly extending peripheral vertical support band secured adjacent its bottom, such that said support band and said stop ring abut each other, as said sections are stacked with respect to each other; and

ii. at least three radially outward extending flanges, positioned beneath said support band, so as to be registrable and said stop ring peripheral slots during stacking of said sections with lockingly engageable with and under said stop ring inwardly extending flanges upon twisting of said inner section with respect to said outer section; and

iii. at least three longitudinally extending splines positioned under the said flanges, so as to align said inner section with respect to said outer section, concrete filling the vertical interstices defined by said splines between portions of said sections adjacent said stop ring and locking band; and

iv. said splines being further characterized as having a greater outside diameter than said flanges.

2. In a column of the type formed from a plurality of interlocking sections rigidized with respect to each

other by the pumping of fluid concrete therein, a joint as in claim 1, including longitudinally extending splines positioned upon the exterior of said inner section beneath each said outwardly extending flange.

3. In a column of the type formed from a plurality of interlocking sections rigidized with respect to each other by the pumping of fluid concrete therein, a joint as in claim 2, said spline bottom ends being coextensive with the bottom of said inner section.

4. In a column of the type formed from a plurality of interlocking sections rigidized with respect to each other by the pumping of fluid concrete therein, a joint as in claim 3, peripheral portions of said inner section intermediate said splines being open, such that pumped concrete enters and sets intermediate said splines at the stacked and twist-locked portions of said inner and outer sections.

5. In a column of the type formed from a plurality of interlocking sections rigidized with respect to each other by the pumping of fluid concrete therein, a joint as in claim 4, said inner section having four radially outwardly extending flanges, defining four stop ring peripheral slots, and said outer section having corresponding radially inwardly extending flanges and slots such that a quarter turn of said inner section with respect to the outer section locks said sections longitudinally with respect to each other.

6. In a column of the type formed from a plurality of interlocking sections rigidized with respect to each other by the pumping of fluid concrete therein, a joint as in claim 5, said splines having an inclined lower shoulder leading downward to the bottom of said inner section.

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