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# United States Patent [19]

[11] **Patent Number:** **5,826,387**

**Henderson et al.**

[45] **Date of Patent:** **\*Oct. 27, 1998**

[54] **PIER FOUNDATION UNDER HIGH UNIT COMPRESSION**

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[76] Inventors: **Allan P. Henderson**, 5919 Mohawk Dr., Bakersfield, Calif. 93308; **Miller B. Patrick**, 5808 Baywood, Bakersfield, Calif. 93309

[\*] Notice: The term of this patent shall not extend beyond the expiration date of Pat. No. 5,586,417.

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[21] Appl. No.: **773,053**

[22] Filed: **Dec. 24, 1996**

### [57] ABSTRACT

#### Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 346,935, Nov. 23, 1994, Pat. No. 5,586,417.

[51] **Int. Cl.**<sup>6</sup> ..... **E02D 5/38**; E02D 27/32

[52] **U.S. Cl.** ..... **52/295**; 52/223.4; 52/296; 405/249; 405/251; 405/256

[58] **Field of Search** ..... 52/223.4, 223.5, 52/294, 295, 296, 741.11, 741.14, 741.15, 742.14; 405/229, 231, 232, 233, 236, 237, 238, 239, 242, 249, 251, 255, 256

An upright cylindrical pier foundation is constructed of cementitious material. The lower end of the foundation has a plate or circumferential ring fully embedded therein and long circumferentially spaced rods or bolts have their lower ends anchored relative to the ring. The upper ends of the long rods project up outwardly of the top of the foundation. The rods are shielded over substantially their entire length against bonding with the cementitious material to allow the rods, when heavily tensioned, to stretch within the cementitious material. A heavy flange, which may comprise the base flange of a tubular tower, is positioned downwardly upon the upper end of the foundation with the upper ends of the bolts projecting through holes provided therefor in the base flange. Nuts are threaded downwardly upon the upper ends of the bolts and against the base flange under high torque in order to place the bolts in heavy tension and substantially the entire length of the cylindrical foundation under high unit compressive loading. The pier foundation may include a diametrically enlarged upper end shoulder portion whose outer peripheral portion includes additional circumferentially spaced heavily tensioned short rods anchored between a second anchor plate or ring embedded in the shoulder portion and a second flange or ring seated downwardly on the shoulder portion upper end. Also, the long rods may include shorter rod sections suitably coupled together and sections of the foundation may be precast with the sheathed rods in place.

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**19 Claims, 10 Drawing Sheets**

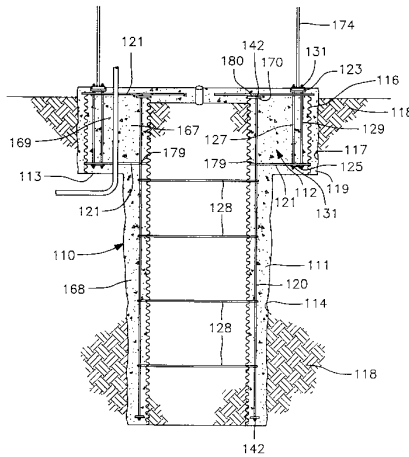


FIG. 1

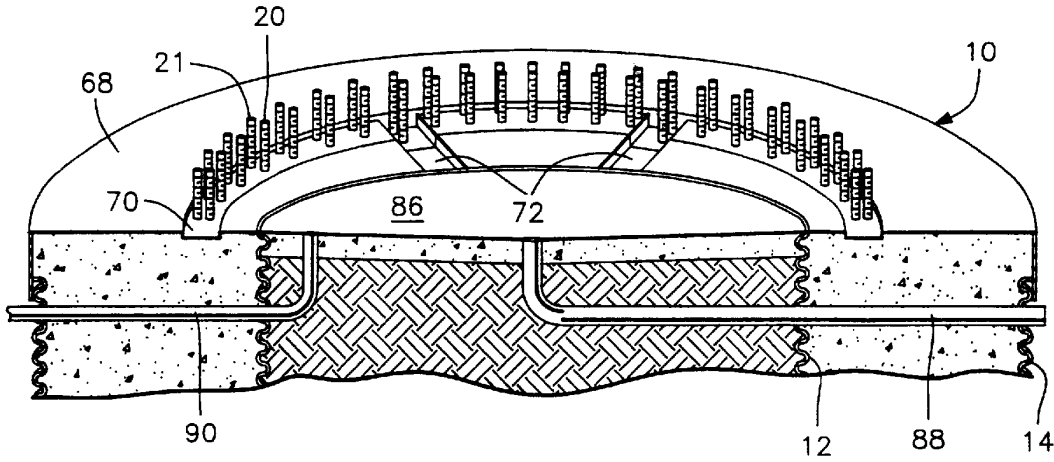


FIG. 4

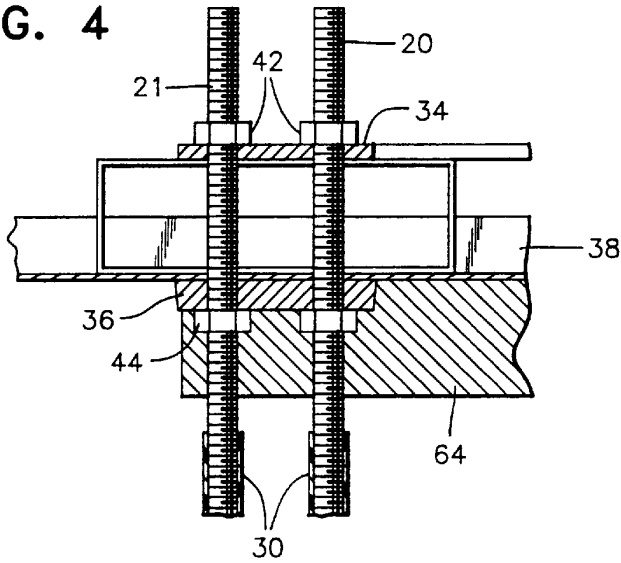


FIG. 5

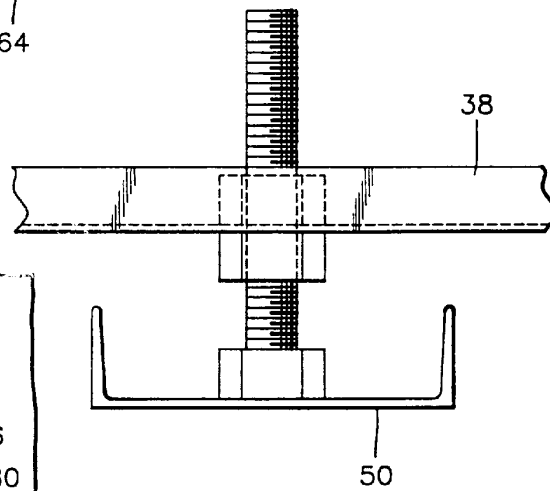
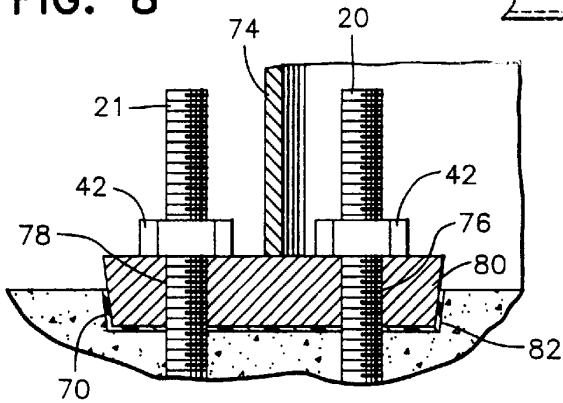


FIG. 8



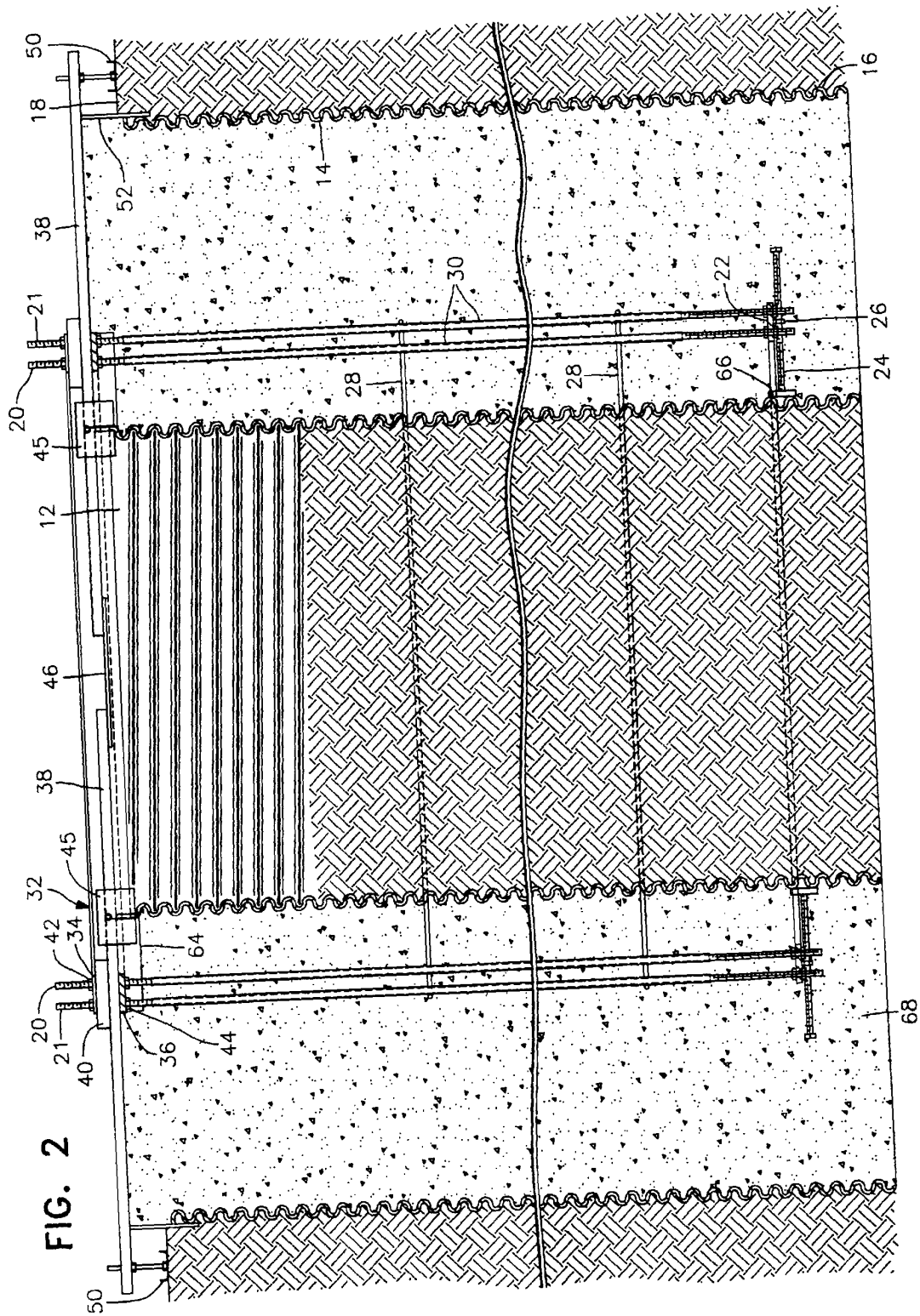


FIG. 2

FIG. 3

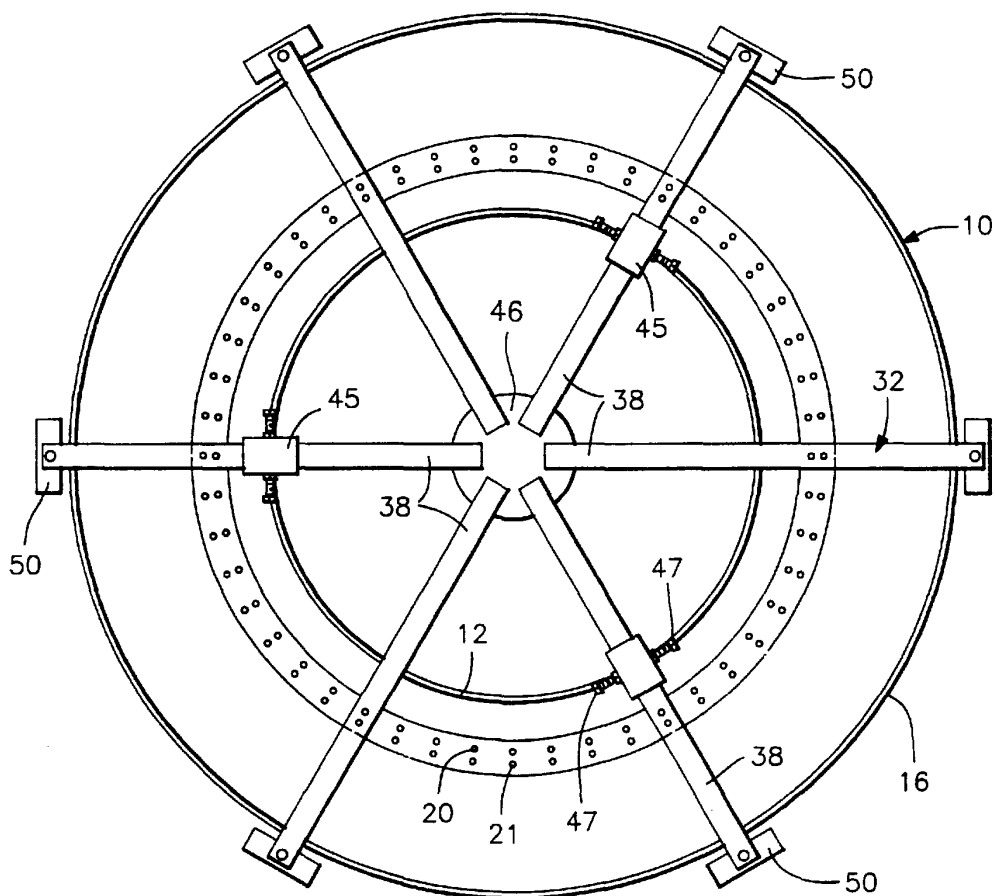


FIG. 6

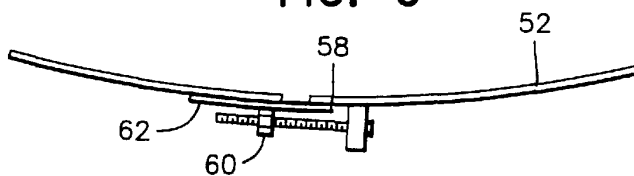


FIG. 7

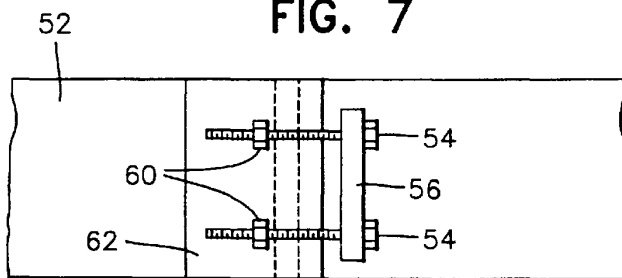


FIG. 9

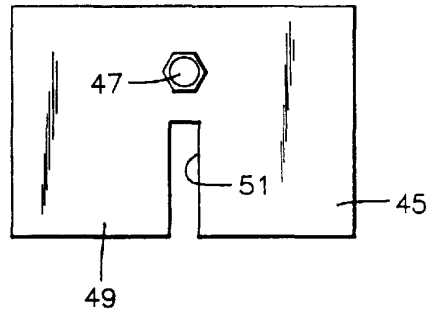


FIG. 10

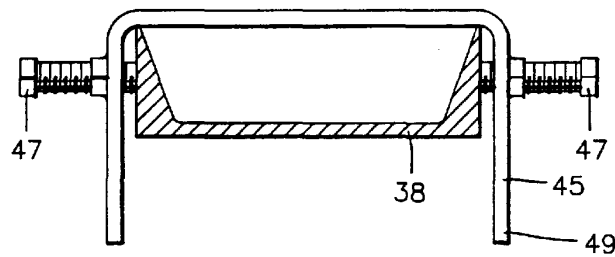
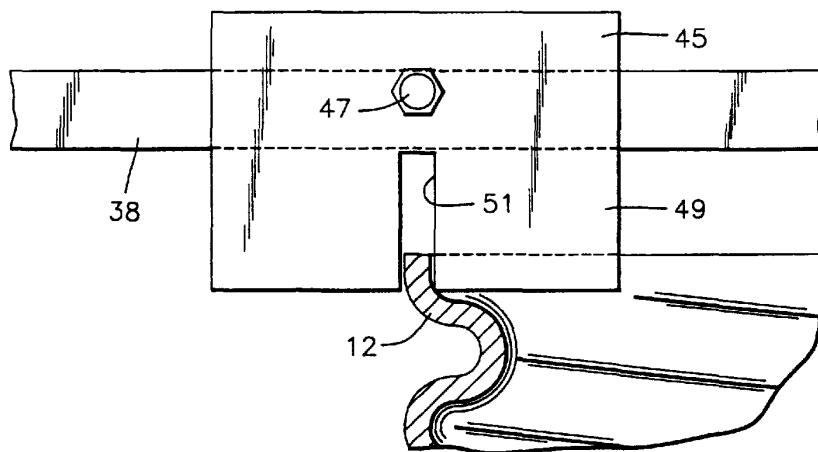


FIG. 11



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