Nov. 14, 1961 M. L. CLEVETT, JR 3,008,557

FOUNDATION FOR PORTABLE STRUCTURES

Filed May 20, 1959 2 Sheets-Sheet 1

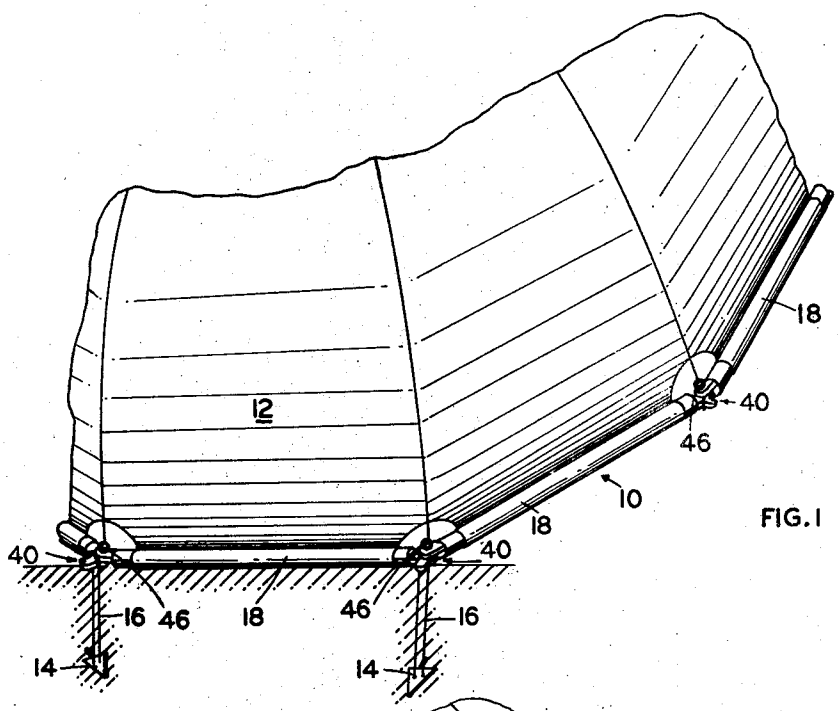


FIG. 1

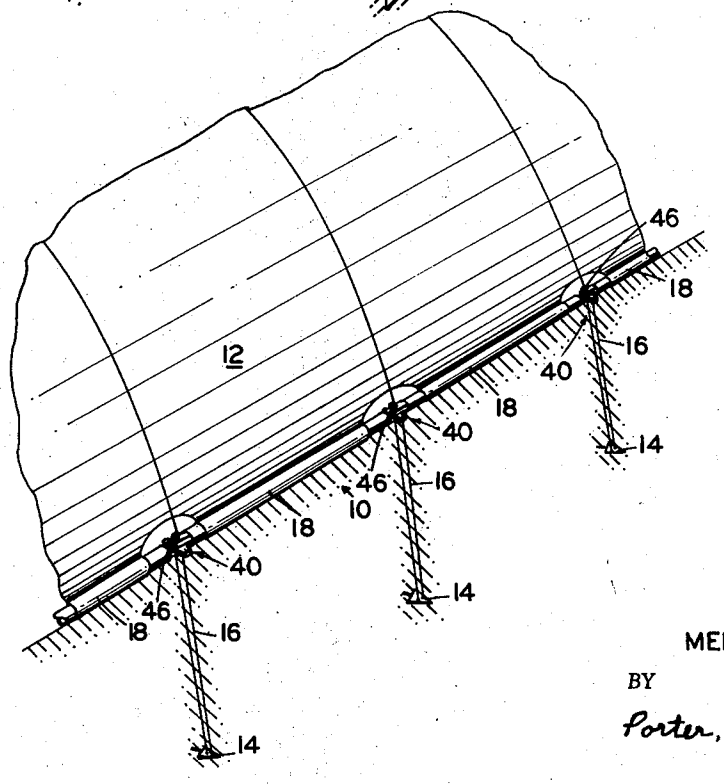


FIG. 2

INVENTOR.
MERTON L. CLEVETT JR.

BY

Porter, Chittick & Russell

ATTORNEYS

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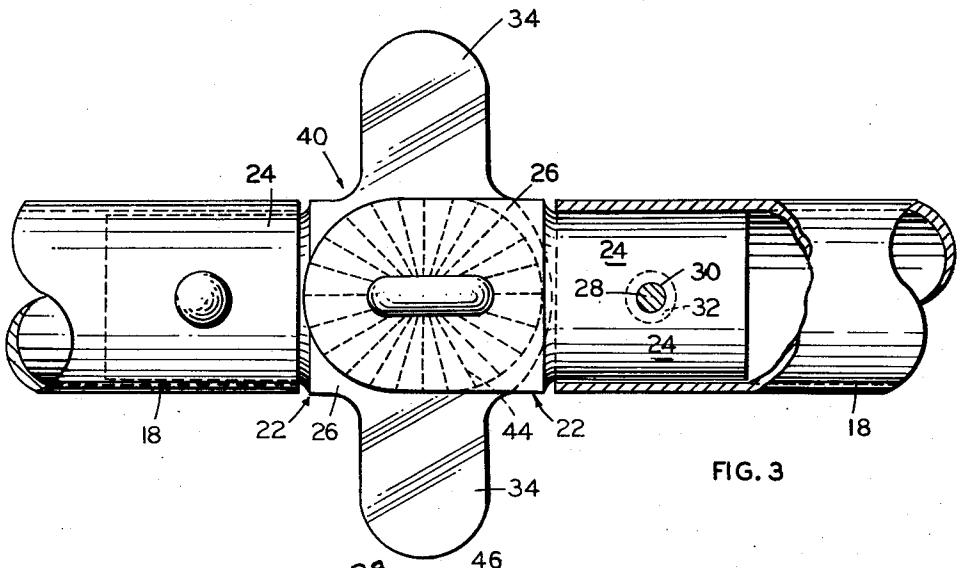


FIG. 3

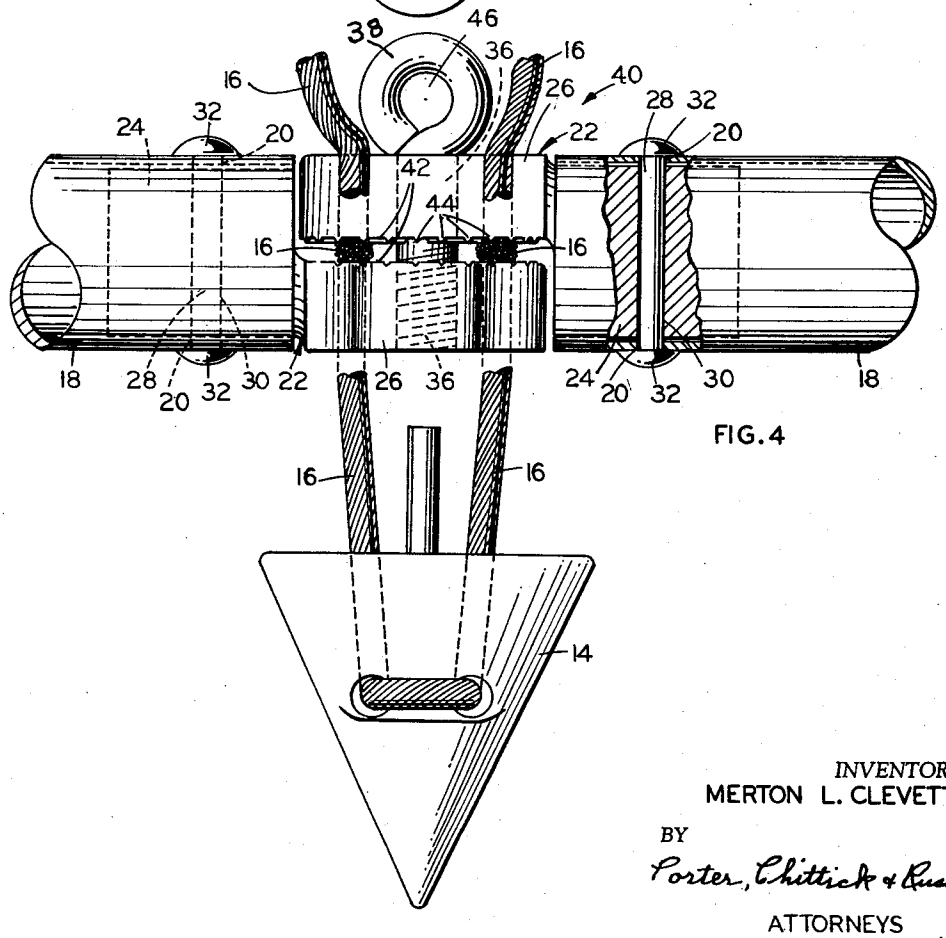


FIG. 4

INVENTOR.
MERTON L. CLEVETT JR.

BY
Porter, Chittick & Russell
ATTORNEYS

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FOUNDATION FOR PORTABLE STRUCTURES

Merton L. Clevett, Jr., Natick, Mass., assignor to Laconia Malleable Iron Company, Inc., Laconia, N.H., a corporation of New Hampshire

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1 Claim. (Cl. 189—90)

This invention relates to anchoring means for temporary or portable structures and more particularly to a system of simplified interconnecting members forming a foundation and anchoring means for such structures.

Heretofore, the anchoring and foundation systems which have been used with portable temporary structures have been considerably more complex than the associated structures. Moreover, although portability is a function of weight and bulk the systems used in the past have been generally heavy and massive. Furthermore, the complex and massive schemes used hitherto are not readily adaptable to various shapes and sizes of structures. What has been required is an anchoring system which matches the structure itself in simplicity, light-weight, adaptability and reliability.

It is an object of my invention, therefore, to provide a simplified foundation system for portable temporary structures. Another object of my invention is to provide a light-weight foundation system for such structures. A further object of my invention is to provide an anchoring means which is adaptable to various structures, structure configurations and dimensions. Still another object of my invention is to provide a device which is easily assembled and disassembled. A still further object of my invention is to provide a foundation means which can be fabricated economically using standard components whenever possible and the minimum number of operative elements.

A feature of the invention is the use of standard steel tubing to provide the primary members for the anchoring system. Another feature of the invention is the provision of connecting units which are fashioned from a simple casting, one end of which is placed and secured within the steel tubing with the part of the casting protruding beyond the end of the tube formed into a flattened section having extending ears on each side thereof. The inside surface of the flattened section is provided with radial grooves or serrations which correspond to the radial grooves of an identical unit turned 180° in a corresponding and connecting section of pipe. The flattened portions have holes therein which are threaded and are connected together by a triple purpose eye bolt inserted at the top of one of the connecting units. A feature of this arrangement is that the space between the grooved faces of flattened pieces permits ground anchor cables to be connected and secured therein when the eye bolt is tightened. This feature also allows adjacent lengths of tubing to assume any desired angular disposition. Another feature of the eye bolt arrangement is that it may be tightened by a simple lever or rod inserted in the eye; in fact the same tool used to insert ground anchors can be employed. The eye of the bolt serves still another function of providing means for securing structure cables to the foundation system. A still further feature of the invention are the ears extending outwardly of the flattened portion which limit any tendency for axial movement or torque of the pipe sections. Yet another feature of the invention is the use of simplified rivets extending through the steel tubing and through a hole drilled in the section of the casting inserted within the pipe. A still further feature of the invention is that the arrangement herein described permits the base to assume any configuration required, either rectangular, polygonal, trapezoidal or some irregular shape; and by shortening the size of the steel tube sections the system can be made to assume even more complex configurations.

These and other objects and features of the invention will best be understood from a detailed description in which:

FIG. 1 is a partial perspective view of a simplified foundation system assuming a polygonal form and secured to the ground by ground anchors and cables attached to the anchoring system;

FIG. 2 is a partial perspective view of a straight sided foundation system which can be either two separate straight sides or part of a larger rectangular shape;

FIG. 3 is a top view partly cut away showing the connecting units inserted in the pipe sections; and

FIG. 4 is a side view of the connecting units used herein with anchoring cables inserted between the radially grooved flattened portions.

In each of FIGS. 1 and 2 an anchoring system embodying the present invention designated **10** is shown securing a temporary portable structure **12**. The system **10** is connected to ground anchors **14** by ground anchor cables **16**. The same numbers are used to indicate the same parts in FIGS. 1 and 2, the two figures indicating two possible applications of the anchoring system one of which takes a circular or polygonal configuration as in FIG. 1, the other, FIG. 2, showing an installation requiring a straight sided system.

The basic units of system **10** are primary elements **18** which can be made of any standard metallic tubing or pipe cut to a desired length with holes **20** being drilled near each end thereof on a diametric line of the circular cross-section.

As best shown in FIGS. 3 and 4, a connecting unit generally designated **22** is inserted at each end of a pipe section **18**. The unit **22** may be machined or cast from any suitable metal. One end **24** of this connecting unit has a substantially cylindrical configuration with a diameter dimension permitting it to make a snug fit within the interior walls of the pipe section **18**. The connecting unit **22** is secured to the pipe sections **18** by a simple rivet **28** which passes through the holes **20** in the pipe and through a hole **30** in the cylindrical part **24** of the unit. Rivet heads **32** keep the rivet **28** in place.

A portion **26** of the connecting unit **22** extending beyond the end of pipe section **18** is flattened and also flares out to form protruding ears **34**. The ear members **34** are provided to prevent axial torque or twisting of the pipe members **18** when interconnected. They serve the additional function of better locating a section of pipe on the ground in operative position. As shown in FIG. 4, a threaded hole **36** is provided in the flattened portion **26** of the coupling units **22** so that a threaded eye bolt **38** can connect any two pipe sections together forming a joint designated **40**. The thickness of the flattened portion **26** is somewhat less than half that of the cylindrical part **24** inside the pipe so that the combined thickness of two units with ground anchor cables **16** sandwiched therebetween is about equal to the outer diameter of the pipe **18**.

The inside face **42** of the flattened outer portion **26** of unit **22** which is adjacent the axis of the pipe section **18** is provided with radial grooves or serrations **44**. When two such grooved faces **42** are placed in juxtaposition and brought together by eye bolt **38** these grooves will provide a means of gripping and securing ground anchor cables to the foundation system, or, if there are no ground anchor cables at a joint **40**, the grooves **44** positively lock the joined sections in any desired angular disposition.

The assembling process is simple. Pipe sections **18** with a coupling unit **22** at each end are placed end to end with eye bolt **38** started. Ground anchors **14** are installed near each or some of the joints **40** and the cables **16** are placed

between the grooved faces **42**. When the cables **16** are made taut, the eye bolt **38** may be tightened down thereby simultaneously securing the joint **40** and the ground anchor cables **16**. The tightening process can be conveniently performed by the same pipe tool which is used to insert the ground anchors **14**. Once the foundation **10** is secured at a few points to ground anchors, the various eye bolt loops **46** can receive the cables and lines from the associated structure.

Of course, there are many possible variations of the invention. For example, as shown in FIG. 3 only one of the connecting units **22** need have ear members **34** for each length of pipe **18**.

Certain minor variations of this preferred embodiment will be apparent to those skilled in the art; and, therefore, it is not my intention to confine the invention to the precise form herein shown, but rather to limit it in terms of the appended claims.

Having thus described and disclosed a preferred embodiment of my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

Means for securing two tubular elements to each other and to the ground comprising a longitudinal member attached to a terminal end of each tube, and a horizontally

extending flat connecting member on the end of each said longitudinal member having a serrated face; said means arranged in opposed relation at adjacent ends of said tubular elements with said flat connecting members in overlapping relation and with said serrated faces facing each other; a hole receiving a threaded bolt in each said flat connecting member with the uppermost said hole being larger than said bolt and the lower said hole being tapped and receiving said bolt in threaded engagement; a ground anchor; a cable attached to said anchor and positioned between said serrated faces whereby said connecting means and said cable cooperate mutually in the dual function of securing said tubular elements in fixed angular relation and to said ground anchor.

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