Nov. 25, 1958 A. P. HAYDEN 2,861,332

METHOD OF TENSIONING GUYS

Filed May 11, 1955

2 Sheets-Sheet 1

FIG. 1.

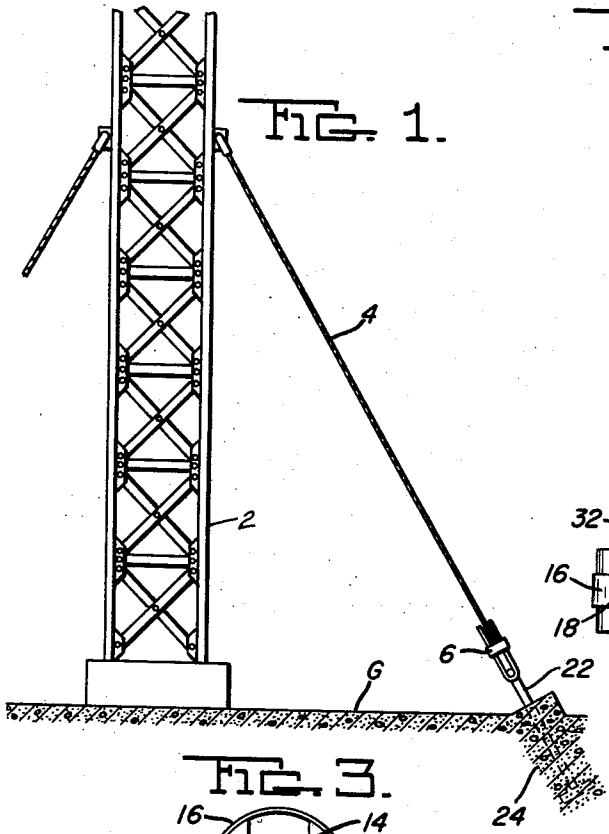


FIG. 3.

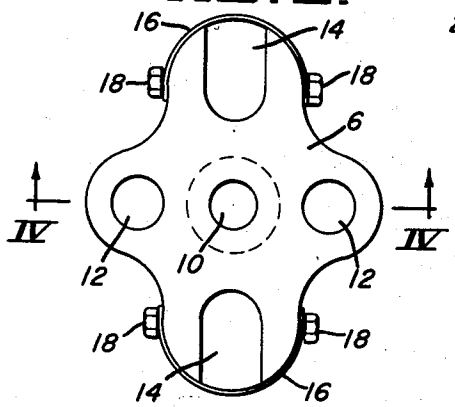


FIG. 4.

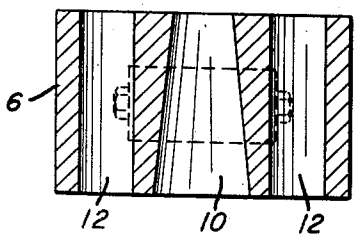


FIG. 5.

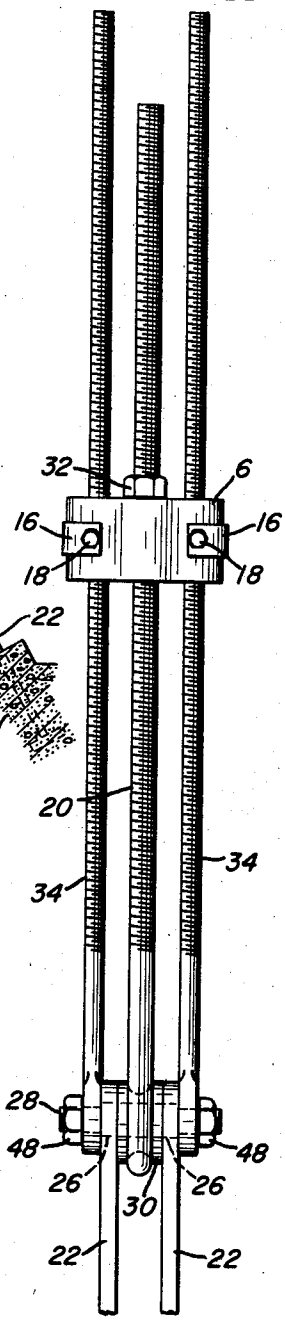
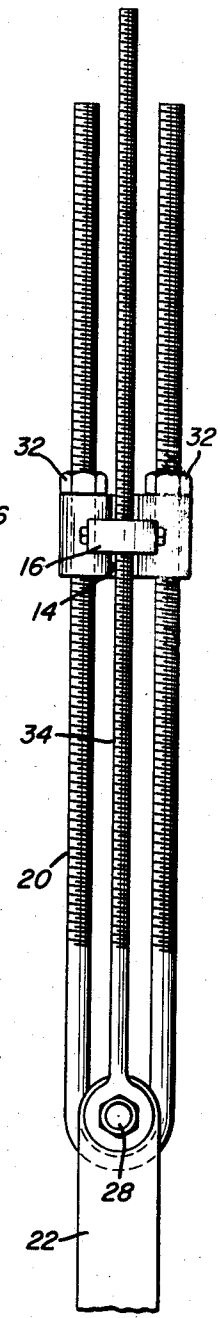


FIG. 6.



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METHOD OF TENSIONING GUYS

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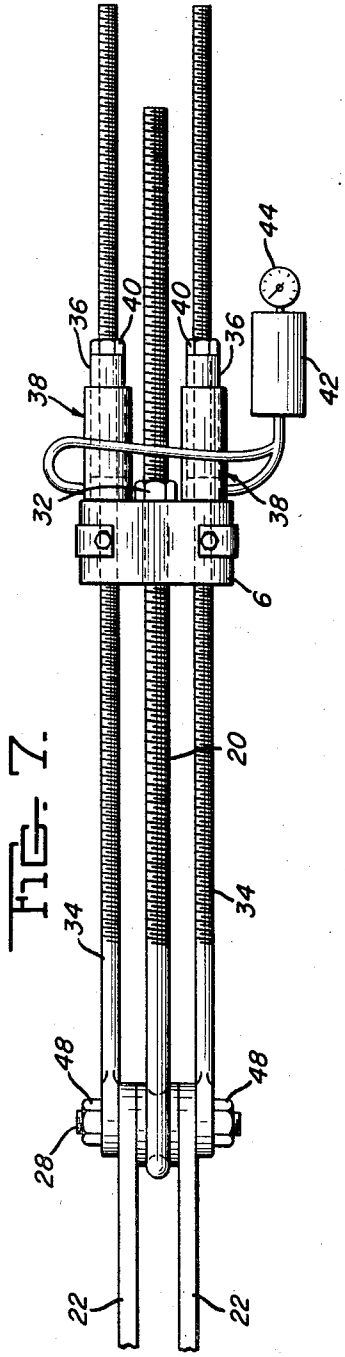


FIG. 7.

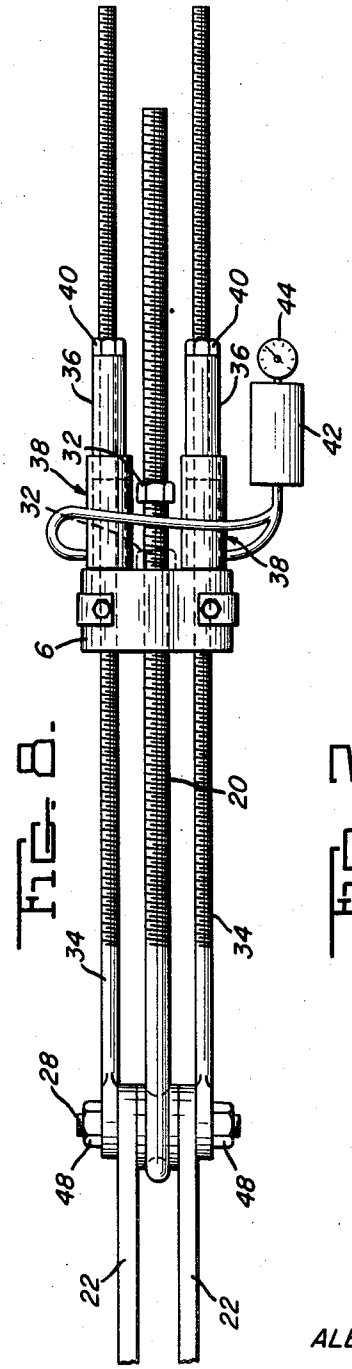


FIG. 8.

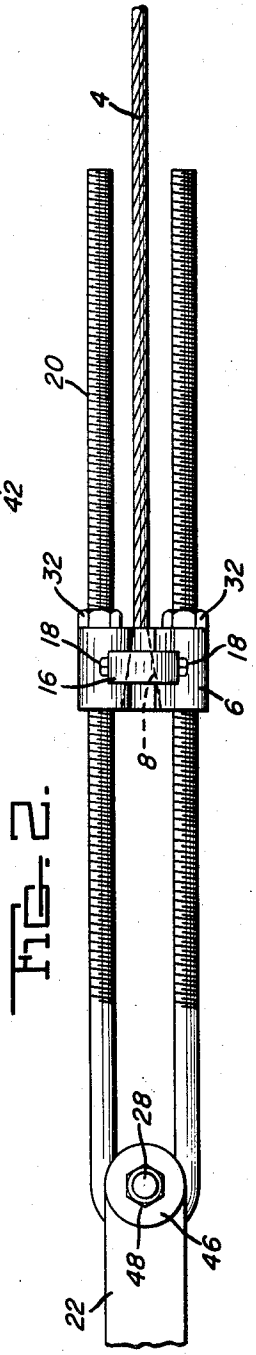


FIG. 2.

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METHOD OF TENSIONING GUYS

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Application May 11, 1955, Serial No. 507,576

5 Claims. (Cl. 29—452)

This invention relates to the connecting and tensioning of guys and more particularly to tensioning guys extending between a tower and an anchorage. The term "tower" is used to cover any high structure such as a power cable tower, radio and TV towers, stacks and the like. It is often necessary and desirable to provide a system of guys having one end attached to the tower and the other end fastened to the ground. The guys are usually in the form of strand or wire rope. It is desirable to apply a definite predetermined erection tension to the guys in order to limit the movement of the tower and maintain tensions within design limits. In the past erectors have estimated the tensions by observing the deflection of strands but this method is rough and inaccurate. Another method of applying the desired tension to the tower guys is shown in the patent to Howe No. 2,071,694, dated February 23, 1937. The method disclosed therein consists of casting zinc buttons on the guy, inscribing marks on these buttons while the guy is held in prestressing equipment at the designated erection tension and matching the marks with corresponding marks 100 inches apart on a rod. The tension is obtained at erection by taking up on the anchorage bolts until the marks on the strand again match the marks on the rod.

It is an object of my invention to provide a method of connecting a guy between a tower and an anchorage and applying a predetermined tension to the guy.

This and other objects will be more apparent after referring to the following specification and attached drawings, in which:

Figure 1 is a view of a tower with an attached guy;

Figure 2 is an enlarged view showing the final connection of the guy to the anchor bars;

Figure 3 is an enlarged view of a socket member used in connecting a guy strand or wire rope;

Figure 4 is a view taken on the line IV—IV of Figure 3;

Figure 5 is a view showing the position of parts in an intermediate stage of the assembling operation, the guy being omitted for the sake of clearness;

Figure 6 is a view taken at right angles to Figure 5;

Figure 7 is a view, similar to Figure 5, showing the position of parts at a further stage of the assembling operation; and

Figure 8 is a view, similar to Figure 7, showing the position of the parts in the next stage of the assembly.

Referring more particularly to the drawings, reference numeral 2 indicates a tower to which guys 4 are attached in the usual manner. The other end of the guy 4 is attached to a bridge socket 6 by a zincked connection 8. For this purpose the socket is provided with a conical hole 10 through the center thereof with the large diameter of the hole being toward the ground. The socket 6 has a first pair of diametrically opposed holes 12 on opposite sides of the hole 10 and a second pair of diametrically opposed openings 14 arranged between said first pair of holes. Each of the openings 14 is slotted outwardly to the periphery of the socket 6.

Each of the slotted openings is adapted to be covered by a strap 16 attached to the socket 6 by means of cap screws 18. The legs of a U-bolt 20 pass through the holes 12 and extend above the top of socket 6. A pair of anchor bars 22 are attached to the ground G in any desired manner such as by anchoring in a cement footer 24. The anchor bars 22 have aligned holes 26 therein for receiving a threaded pin 28. A spool 30 is provided on the pin 28 between the anchor bars 22 and the lower end of the U-bolt 20 is received in the groove of the spool.

The strands 4 are shipped to the job attached to the bridge socket 6. In assembly, the bottom end of the U-bolt 20 is passed around the spool 30 and the pin 28 inserted through the holes 26 and the bore of the spool with the spool being positioned between the anchor bars 22. The guy strand 4 is then pulled up by block and tackle, long erection bolts or in any other desired manner until a nut 32 can be threaded on each leg of the U-bolt 20 for at least the full height of the nut. A pair of erection eye bolts 34 are then positioned one on each end of the pin 28 with the eyes surrounding the pin and the threaded ends in the slotted holes 14. If desired the eye bolts 34 can be used to pull up the guys until the nuts 32 can be threaded on U-bolt 20. The straps 16 are then fastened in place. At this time the parts will be arranged as shown in Figures 5 and 6 although the nuts 32 need not be threaded on the bolt 20 as far as shown. A center hole hydraulic ram 36 of a hydraulic jack 38 is then positioned on each erection bolt 34 with its lower end bearing against the top of socket 6. Nuts 40 are threaded down on bolts 34 against the top of the rams, as shown in Figure 7. Hydraulic jacks 38 may be of any suitable type and are connected to a pumping unit 42 so arranged that pressures are applied to both jacks simultaneously. A direct reading gauge 44 is provided in the system to indicate the load. The applied pressure expands the rams 36 driving the socket 6 downwardly to the position shown in Figure 8. The nuts 32 are then threaded down against the socket 6 and the pressure in the jacks released. If necessary, the load is again applied to move the socket 6 downwardly and the nuts 32 again threaded down against the socket 6. This operation is repeated until the gauge 44 reads the required erection tension. The jacks 38 and erection bolts 34 are then removed and washers 46 placed on the pin 28 on each side of the anchor bars 22 to fill up the space originally occupied by the eye bolts. Nuts 48 are threaded on the pin 28 to permanently hold the assembly in position. The guy tensions can readily be checked as desired and adjusted when required.

While one embodiment of my invention has been shown and described it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

I claim:

1. The method of connecting a guy between a tower and an anchor bar and applying a predetermined tension to the guy which comprises providing a bridge socket having the guy attached thereto, connecting the bridge socket to said anchor bar by means of a first bolt extending above said bridge socket, threading a nut on said first bolt until it bears against the upper end of the socket, passing a second bolt through a hole in said bridge socket and anchoring its lower end, placing a center hole hydraulic ram over said second bolt above the bridge socket, threading a nut on said second named bolt, applying pressure to said ram to force said bridge socket downwardly, then threading the nut downwardly on said first bolt until it bears against the upper end of the socket, then releasing the pressure on said ram, and removing said second bolt.

2. The method of connecting a guy between a tower and an anchor bar and applying a predetermined tension to the tower guy which comprises providing a bridge socket having the guy attached to the central part thereof, said socket having a first pair of diametrically opposed holes on opposite sides of said guy and a second pair of diametrically opposed holes arranged between said first pair of holes, connecting said bridge socket to said anchor bar by means of threaded means passing through the first pair of holes and extending above said bridge socket, threading nuts on said threaded means above said bridge socket, passing a bolt through each of said second pair of holes and anchoring its lower end, placing a center hole hydraulic ram over each bolt above the bridge socket, threading a nut on each bolt against the upper end of the ram, applying pressure to said rams to force said bridge socket downwardly, threading the nuts downwardly on said threaded means until they again bear against the upper end of the socket, then releasing the pressure on said rams, and removing said bolts.

3. The method of connecting a guy between a tower and a pair of anchor bars and applying a predetermined tension to the tower guy which comprises providing a bridge socket having the guy attached to the central part thereof, said socket having a first pair of diametrically opposed holes on opposite sides of said guy and a second pair of diametrically opposed holes arranged between said first pair of holes, passing the legs of a U-bolt through the first pair of holes, passing a pin through holes in the anchor bars with the U-bolt between the anchor bars and around the pin, threading a nut on each leg of the U-bolt, passing a bolt through each of said second pair of holes and anchoring its lower end to said pin, placing a center hole hydraulic ram over each of the last named bolts above the bridge socket, threading a nut on each of the last named bolts against the upper end of the ram, applying pressure to said rams to force said bridge socket downwardly, threading the nuts downwardly on said U-bolt until they again bear against the upper end of the socket, then releasing the pressure on said rams and removing said bolts.

4. The method of connecting a guy between a tower and a pair of anchor bars and applying a predetermined tension to the tower guy which comprises providing a bridge socket having the guy attached to the central part thereof, said socket having a first pair of diametrically opposed holes on opposite sides of said guy and a second pair of diametrically opposed holes arranged between said first pair of holes, passing the legs of a U-bolt through the first pair of holes, passing a pin through holes in the anchor bars with the U-bolts between the anchor bars and around the pin, threading a nut on each

leg of the U-bolt against the upper end of the socket, placing an eye-bolt on the pin on the outer side of each another bar with its threaded portion extending through one of said second pair of holes, placing a center hole hydraulic ram over each eye-bolt above the bridge socket, threading a nut on each eye-bolt against the upper end of the ram, applying pressure to said rams to force said bridge socket downwardly, then threading the nuts downwardly on said U-bolt until they again bear against the upper end of the socket, then releasing the pressure on said rams, and then removing said eye-bolts.

5. The method of connecting a guy between a tower and a pair of anchor bars and applying a predetermined tension to the tower guy which comprises providing a bridge socket having the guy attached to the central part thereof, said socket having a first pair of diametrically opposed holes on opposite sides of said guy and a second pair of diametrically opposed holes arranged between said first pair of holes, each of said second pair of holes having a slot extending outwardly to the periphery of said bridge socket, passing the legs of a U-bolt through the first pair of holes, passing a threaded pin through holes in the anchor bars with the U-bolts between the anchor bars and around the pin, threading a nut on each leg of the U-bolt against the upper end of the socket, placing an eye-bolt on the pin on the outer side of each anchor bar with its threaded portion extending through one of said second pair of holes, placing a center hole hydraulic ram over each eye-bolt above the bridge socket, threading a nut on each eye-bolt against the upper end of the ram, applying pressure to said rams to force said bridge socket downwardly, then threading the nuts downwardly on said U-bolt until they again bear against the upper end of the socket, then releasing the pressure on said rams, then threading the nuts downwardly on said eye-bolts until they again bear against the upper end of the ram, again applying pressure to said rams and repeating said operations until a predetermined pressure is applied to said guy, then removing said eye-bolts, and threading nuts on the ends of said threaded pin to hole the U-bolt and anchor bolts in place thereon.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 2,861,332

November 25, 1958

Albert P. Hayden

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

Column 4, line 3, for "another" read -- anchor --.

Signed and sealed this 17th day of February 1959.

(SEAL)

Attest:

KARL H. AXLINE

Attesting Officer

ROBERT C. WATSON

Commissioner of Patents