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E. A. BLACK

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ANCHORAGE

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FIG. 1.

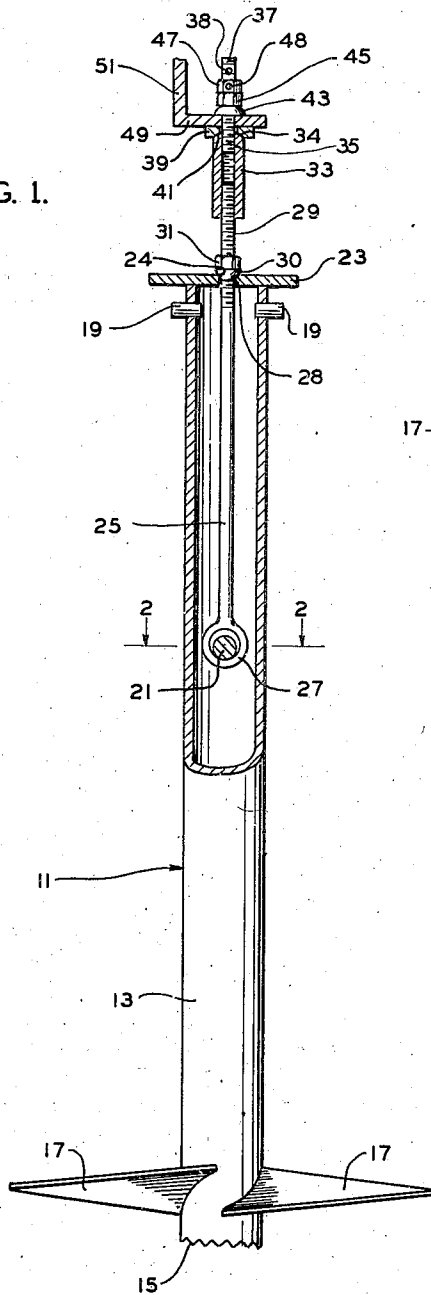
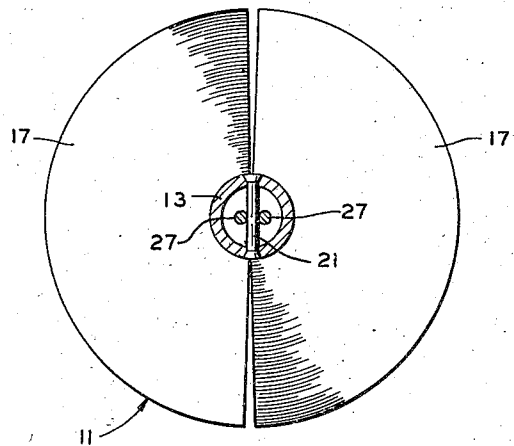


FIG. 2.



INVENTOR.
ERIC A. BLACK

BY

William D. Hall

ATTORNEY

UNITED STATES PATENT OFFICE

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ANCHORAGE

Eric A. Black, Red Bank, N. J.

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4 Claims. (Cl. 189—21)(Granted under the act of March 3, 1883, as
amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates to improvement in anchorages and particularly anchorages which are longitudinally and laterally adjustable.

In installing anchorages for various structures, such as towers, masts, and the like, difficulty has been found in positioning and aligning them exactly as desired. This problem arises with a number of types of anchorages, but a solution will be illustrated in connection with a helical screw type pile footing, where the difficulty is particularly prevalent.

It is an object of the present invention to provide an anchorage which, after installation, may be adjusted both longitudinally and laterally.

It is a further object to provide such an anchorage which may be adapted for use with various types of pile footings.

It is a further object to provide such an anchorage which takes both tension and compression.

It is a still further object of the present invention to provide such an anchorage which is simple in construction, relatively inexpensive to manufacture and easily adjusted.

The present invention resides generally in a longitudinally adjustable anchor bolt which is pivotably secured at its lower end to a pile footing.

For a better understanding of the invention, together with other and further objects thereof, reference is had to the following description, taken in connection with the accompanying drawing, and its scope will be pointed out in the appended claims.

In the drawing,

Figure 1 is a longitudinal cross section of one embodiment of the present invention wherein it is incorporated into a helical screw type pile footing and

Figure 2 is a transverse cross section, along the line 2—2 of Figure 1.

With reference to the drawing, there is shown a helical screw type pile footing 11 made up of a circular pipe 13, provided with a serrated lower extremity 15. A short distance above the lower end are a pair of outwardly extending, diametrically opposite, helical cutting fins 17. Extending outwardly radially from the upper portion of the pipe 13 are a pair of pins 19.

Disposed diametrically through the pipe 13, at a point intermediate the pins 19 and the fins 17 is a shaft 21 which is securely and rigidly fastened

to the pipe 13, its ends being flush with the outside surface of said pipe.

Resting upon the upper end of the pipe 13 is a circular, washer-like, plate 23, of approximately twice the diameter of said pipe, which plate 23 is pierced by a single aperture. The upper surface of said plate 23 is provided with a rounded central concave surface 24.

Disposed within the upper portion of the pipe 13 and extending upwardly, loosely through the plate 23, and beyond the upper end of said pipe, is an elongated anchor bolt 25. Said anchor bolt 25 is provided, at its lower extremity, with an eye 27 which loosely encircles the transverse shaft 21. The upper end 29 of said bolt 25 is screw-threaded and is provided, immediately above the plate 23, with a loosely fitting washer 30, the lower face of which forms a rounded convex surface 28 to cooperate with the concave surface 24 aforementioned, and a nut 31.

Threadedly coupled to the upper end of the anchor bolt 25 is an elongated, internally threaded sleeve 33, the upper end 34 of which is convexly rounded. The lower end 35 of a short length of externally threaded rod 37 is threaded into the upper end of the sleeve 33 and then permanently welded in place therein so as to become integral with said sleeve 33. Said rod 37 is provided with a loosely fitting, annular bearing 39, such as of the "oilite" type, the under surface of which is provided with a rounded concave surface 41 to cooperate with the rounded convex upper end 34 of the sleeve 33. Said rod 37 is also provided with a loosely fitting washer 43, the upper surface of which is convexly rounded, a tension nut 45 and a lock nut 47, one above the other in the order named.

The upper end of the rod 37 and the lock nut 47 are both pierced by transverse holes 38, 48, which may be put into register by raising the nut a suitable distance, so that a short pin (not shown) may be inserted therethrough, by means of which the nut 47 may be locked to the rod 37. As shown in the drawing, there is secured to the anchorage a flange 49, which is secured to the lower end of one leg 51 of a tower (not shown).

The apparatus aforesaid should also be provided with a suitable means for screwing the pile footing into the ground. A conventional means for that purpose is a short tubular member of a size to telescope over the upper end of the pipe 13. Said tubular member is provided with two longitudinally disposed, diametrically opposite slots at its lower end and is also provided with a long bar, extending transversely through it. To sink the

pile footing the tubular member just described may be fitted over the upper end of the pipe 13 so that the pins 19 fit into the slots. Said tubular member may then be rotated manually by means of the long transverse bar, so as to screw the pile footing 11 into the ground.

In the operation of the embodiment of the present invention described above, the helical screw pile footing 11 is first screwed into the ground to the desired depth. The nut 31 is then threaded upwardly a short distance so that the plate 23 is free to slide over the top of the pipe 13. The washer 43 and the nuts 45, 47 are removed from the rod 37. The flange 49 of a tower leg 51 may then be slipped onto the upper end of the rod 37 whereupon said washer 43 and the nuts 45, 47 may be replaced.

Longitudinal adjustment of the tower leg 51 may be accomplished by threading the lock nut 47 on the shaft 31 until the two holes 48, 38 are in register and a pin (not shown) is inserted therethrough. The rod 37 and the sleeve 33 integral with it, as explained above, may then be rotated by any suitable means, as by a wrench on said nut 47. Such rotation causes the bearing 39 and the flange 49, resting upon it, to be adjusted vertically as desired.

The anchor bolt 25 may be moved universally about the shaft 21, should any lateral adjustment of the tower leg 51 be required. When the lateral and longitudinal adjustments are finished, the nuts 31, 45, 47 are tightened downwardly to lock the anchorage as so adjusted.

It will be noted that pivotable adjustment of the anchor bolt 25 is facilitated by the rounded convex and concave surfaces on the plate 23, the washers 30, 43, the sleeve 33, and the bearing 39, already described.

Since many changes may be made in the above construction and many apparently widely different embodiments of this invention can be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. An anchorage for a structure comprising a pipe having one end anchored in the ground and the other end free; a transverse shaft within said pipe; an elongated anchor bolt loosely secured at one end to said shaft for rotatable and longitudinal movement relative to said shaft and having its other end extending beyond the free end of said pipe, said portion so extending being screw threaded; a washer-like plate about said bolt and disposed across the free end of said pipe and of greater diameter than said pipe; a nut threaded upon said bolt and adapted to urge said

washer against the free end of said pipe; an internally threaded sleeve upon said bolt; and means to secure a structure to said sleeve.

2. An anchorage for a structure comprising a helical screw type pile footing; a pipe, its lower end secured to said footing and its upper end open and above the ground level; a shaft secured transversely in said pipe; an elongated anchor bolt disposed within the pipe, one end extending beyond the open end thereof and the other end provided with an eye encircling the shaft aforesaid to allow said anchor bolt to rotate about and slide longitudinally along the said shaft, the end of said anchor bolt extending beyond the pipe being screw threaded and provided with a washer-like plate disposed against the open end of the pipe and of greater diameter than the pipe; a washer on said bolt; a nut and an internally threaded sleeve threadably coupled to said bolt; the plate and the washer aforesaid being provided with cooperating curved surfaces to allow them to be angulated with respect to each other; said sleeve being provided with a threaded rod nonrotatably secured thereto; said rod being provided with a bearing, a second washer and a nut, the bearing and sleeve being provided with cooperating curved surfaces to allow them to be angulated with respect to each other, and the second washer being provided with a convex surface; and means to rotate the sleeve to adjust its position longitudinally relative to the anchor bolt.

3. An anchorage for a structure comprising a pipe having one end anchored in the ground and the other end free, a transverse shaft secured within said pipe, an elongated anchor bolt loosely secured at one end to said shaft for rotatable and longitudinal movement relative to said shaft and having its other end extending beyond the free end of said pipe, a washer-like plate about said bolt and disposed across the free end of said pipe and of greater diameter than said pipe, means upon said bolt adapted to urge said washer against the free end of said pipe, and means upon said bolt beyond said plate to adjustably secure a structure to said bolt.

4. An anchorage for a structure comprising a pipe having one end anchored in the ground and the other end free, an elongated anchor bolt having one end secured within said pipe for substantially universal movement and having its other end extending beyond the free end of said pipe, a washer-like plate about said bolt and disposed across the free end of said pipe and of greater diameter than said pipe, means upon said bolt adapted to urge said washer against the free end of said pipe and means upon said bolt beyond said plate adapted to adjustably secure a structure to said bolt.

ERIC A. BLACK.